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Correspondence: Rumeli Caddesi 47/606, Nişantaşı 34371 İstanbul

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Page 2 - Abstract and key words

Page 3 and next - Main text

Next Page - References

Next Page - Table heading and tables (each table should be placed in separate pages)

Next Page - Figure legends and figures (each figure should be placed in separate pages)

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This page should only include the title of the manuscript, which should be carefully chosen to better reflect the contents of the study. No unusual abbreviations should be used in the title of the manuscript. A short title as running heading not exceeding 40 characters should be given which is desired to appear on top part of continuing pages when journal is published.

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— **Book:** Jones KL. *Practical perinatology*. New York: Springer; 1990. p. 112-9.

— **Chapter in a book:** Sibai BM, Frangieh AY. Eclampsia. In: Gleicher N, editors. *Principles and practice of medical therapy in pregnancy*. 3rd ed. New York: Appleton&Lange; 1998. p. 1022-7.

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All illustrations (photographs, graphics, and drawings) accompanying the manuscript should be referred to as "figure". All figures should be numbered consecutively and mentioned in the text. Figure legends should be added at the end of the text as a separate section. Each figure should be prepared as a separate digital file in "jpeg" format, with a minimum 300 dpi or better resolution. All illustrations should be original. Illustrations published elsewhere should be submitted with the written permission of the original copyright holder. For recognizable photographs of human subjects, written permission signed by the patient or his/her legal representative should be submitted; otherwise, patient names or eyes must be blocked out to prevent identification. Microscopic photographs should include information on staining and magnification.

Each table should be prepared on a separate page with table heading on top of the table. Table heading should be added to the main text file on a separate page when a table is submitted as a supplementary file.

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The following list will be useful during the final check of a manuscript before submission:

1. Manuscript length (max. 4000 words for research articles)
2. Number of authors (max. 6 authors for research articles)
3. Title page (no unusual abbreviations)
4. Abstracts (max. 250 words for research articles)
5. Key words (max. 5 keys for research articles)
6. Main text (subtitles)
7. References (listed according to the rules of ICMJE)
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9. Cover letter
10. Acknowledgement of Authorship and Transfer of Copyright Agreement (undersigned by all authors)
11. Conflicts of Interest Disclosure Statement (if necessary)

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Nutrition, Weight Gain and Exercise During Pregnancy

Oluş Api¹, Orhan Ünal¹, Cihat Şen²

¹Clinics of Gynecology and Obstetrics, Kartal Dr. Lütfi Kırdar Training and Research Hospital, İstanbul

²Department of Gynecology and Obstetrics, Cerrahpaşa Medical Faculty, İstanbul University, İstanbul

Introduction

During pregnancy, energy, nutrition and liquid requirements increase for an appropriate fetal, placental and maternal tissue growth. A healthy nutrition during pregnancy increases the possibility of an on-term fetal development, an uncomplicated gestational period and labor, and a successful lactation period while it has a long-term benefit on the maternal health, reducing the risk for postpartum obesity.

Nutrition during pregnancy is influenced by a variety of genetic, social, cultural, economic and personal factors. Therefore, it is very difficult to determine the direct impact of nutrition on the health during pregnancy. Furthermore, it has been seldomly possible to identify the effect of malnutrition directly on the gestational outcomes. Consequently, evidence for the effect of nutrition on the gestational outcomes is obtained by gathering the results from observational studies, laboratory studies, and experimental studies on food. The impact of inadequate or excess intake of a food on the pregnancy may vary depending on the exposure time or the volume. Furthermore, although metabolic changes during the pregnancy ensure maintenance of the nutrients required for fetal requirements, some pregnancies fail to achieve such adaptive changes. The underlying mechanism for these adaptive changes has not been clearly defined yet.¹

According to the “fetal origins hypothesis” proposed by Barker in 1998, fetal nutrition has a life-

long impact on the metabolism, and it forms an underlying basis for various adult chronic diseases.² During the last decade, several epidemiological data was obtained demonstrating that birthweight is related with hypertension, glucose intolerance, type II diabetes, coronary heart disease and mortality.³⁻⁶ We end up with the restricted fetal growth followed by postnatal catchup growth, resulting in obesity as the most risky pattern for adult chronic disease. However, further studies are needed in order to identify the influence of nutrition during pregnancy, gestational physiology, placental factors and fetal metabolism on the birth weight as well as roles of genetic and environmental factors.

Energy Balance and Weight Gain During Pregnancy

Significance of a healthy nutrition during pregnancy accounts for the positive linear relationship demonstrated between the maternal weight gain and the neonatal birth weight, and also with the impact of prepregnancy body mass index (BMI) on the neonatal birthweight, independent of the gestational weight gained. The potential to deliver a low birth weight infant (<2500 g) is higher for mothers with a low prepregnancy weight and low weight gain during pregnancy as well as the higher potential to deliver a macrosomic infant for mothers with high prepregnancy weight. In other words, the total calorie intake during pregnancy is

the most important nutritional factor known to have influence on the birth weight. During pregnancy, extra energy required in addition to the prepregnancy needs is 330 kkal/day (a total of 80,000 kkal), which corresponds to a maternal weight gain of 10-12 kg in the average term.⁷ However, in a study by King et al., it has been demonstrated that energy needs can show variations ranging from 0 to 120,000 kkal.⁸ Although weak or undernourished pregnant women usually need more energy intake, determination of actual energy requirements is not so easy.

Therefore, the most practical way is to use the gestational weight gain as a barometer of the energy intake. Appropriate weight gain is an indication of good energy intake while inadequate or excessive weight gain implies necessity for evaluating the nutritional status along with the introduction of proper improvements.

Appropriate weight gains and speed of weight gain proposed by the Institute of Medicine (IOM) are shown at Table 1.⁹ In a review by Abrams et al. in 2002, it was observed that the women who gained weight within the limits proposed by IOM had the optimum gestational outcomes in terms of maternal and fetal aspects (low birth weight, macrosomy, rates of spontaneous preterm deliveries, cesarian delivery, maternal postpartum obesity).¹⁰ However, only 30-40% of the pregnant women gained weight within the proposed range.

In the same study by Abrams, it has been indicated that the weight gain in the second trimester is more closely associated with the fetal growth compared to the gains in the first and third trimesters, and that low weight gain in the third trimester may be associated with spontaneous preterm delivery. Although the peak energy need is at between weeks 10 and 30, the maternal fat deposited during that period is used for the fetal growth and lactation in the third trimester.¹¹

Low weight gain during pregnancy is considered any value less than 0.5 kg/month for obese women, and less than 1 kg/month for non-obese women. Any gain exceeding 3 kg/month is considered excessive.⁹

In spite of all this information, it is very difficult to interpret the gestational weight gain as most of the weight gains of the pregnant women with optimum gestational outcomes are out of the range proposed by IOM.¹² Maternal weight gain alone

should not be considered as a specific tool to diagnose the negative gestational outcomes. IOM proposes that a target for appropriate weight gain should be defined in the first prenatal visit for each future mother, and all future mothers should be furnished with detailed information on nutrition and physical activity. Pregnant women with a weight gain out of the planned target should be evaluated on their diet and physical activities, and if possible, this evaluation should be carried out by a dietician, consequently taking action to provide necessary improvements. Such improvement will both contribute to the healthy course of the pregnancy and enable prevention of the postpartum obesity.

Table 1. Recommended weight gains and speed of weight gain based on the prenatal weight*

Weight compared to height	BMI (kg/m ²)	Recommended total gain	Recommended speed of weight gain
		kg	kg/month
Low weight	< 19.8	12.5-18	2.3
Normal weight	19.8-26.0	11.5-16	1.8
Excessive weight	> 26.0-29.0	7-11.5	1.2
Obese	> 29.0	at least 7	0.9

(*) Institute of Medicine. Nutrition During Pregnancy. Part I Weight Gain. Washington DC: Food and Nutrition Board. National Academy of Sciences, 1990.

Balanced Diet During Pregnancy

Although energy intake and maternal weight gain during pregnancy are important parameters of the nutritional status, a balanced diet is much more important than the calorie intake. Food density gives the amount of protein, vitamin and minerals included by each 100 kkal food. Even tough processed ready-made food with low food density provides sufficient energy intake, they lack in the required protein, vitamin and mineral intakes. Daily energy increase recommended as 300 kg calorie corresponds to 17% of the prenatal needs; however, need for vitamin and minerals raises up to 20-100%. Therefore, the selection of food should aim not only the lacked energy, but also intake of high density food which can provide increased mineral and vitamin support (e.g. a high density food like milk should be preferred to a low density food like french fries). However, this is not to say that intake of minerals and vitamin is necessary during pregnancy.

It has been shown that high rate of sugar intake is associated with low birth weight infant deliveries and increased preterm delivery rates in low-income adolescents.¹³

Daily protein need is 60 grams during pregnancy with an increase of 15 grams compared to the prepregnancy period.⁷ Food including protein are also excellent sources of iron, vitamin B6 and zinc. However, animal proteins (red meat, fatty dairy products) lead to fat deposition when they are excessively consumed. Instead of them, food like chicken and fish and light/skim dairy products should be preferred.

Also, although some suggested that high protein intake prevents preeclampsia, no evidence has been shown for the benefits of high protein intake during pregnancy; on the contrary, it has been indicated that excessive intake may be harmful.¹⁴ It has been demonstrated that high amount of protein consumption is associated with preterm delivery and low birth weight infants.

Use of linoleic and α -linoleic acids (omega-3 fatty acids), essential fatty acids, during pregnancy has become the subject of great interest in recent years. Omega-3 fatty acids contribute to the neural and visual development of the fetus. The best sources of omega-3 fatty acids are soy bean and fatty fishes.¹⁵⁻¹⁶ However, high consumption of sea products may lead to excessive intake of toxic substances, which are likely to result in neurological anomalies such as methylmercury and polychlorinated biphenyl, and neurodevelopmental delay.¹⁷

It has been claimed that trans-fatty acids in margarines and ready foods like cakes and biscuits may damage normal metabolism of the fatty acids; they may increase the risk of heart disease in adults; and they may reduce the fetal birth weight and the head circumference.¹⁸ Consequently, further studies should be conducted to identify the required amount and type of fatty acids to be used during pregnancy. Furthermore, it is not known whether support of fish oil is safe or not, and effects of consuming trans-fatty acids are still obscure. In the meantime, pregnant women should be advised that they should meet their fat requirements from unhydrogenated vegetable oils, and consume fish products in moderate amounts, and prefer unprocessed natural food.

Increased Vitamin-Mineral Needs During Pregnancy

Nutrition during pregnancy is a whole ranging from preconception to postconception period; it influences the health of the infant to be born. Nutritional requirements for protein, calcium, iron, zinc, folate, vitamin D and E, ascorbic acid and vitamin B increase 10-100% during pregnancy. A normal nourished person, who has no malnutrition problem, already meets these requirements in his/her daily diet, but a particular attention should be given. Nutrients that are most questioned during pregnancy are as follows:

Sodium

Salt intake during pregnancy should not be restricted; nor an excess consumption should be allowed. In a study where pregnant women were given a sodium-poor diet, it was observed that sodium restriction significantly reduced the quality of entire nutrition. It had no negative effect on birth or placental weight while no influence was seen on the maternal blood pressure.¹⁹ However, pregnant women should be recommended to avoid high salt contents of the processed ready food.

Iron

The hemoglobin concentration declines when hemodilution occurs during pregnancy. Increased iron intake can prevent this decline. According to IOM, the future mother needs an average of 1000 mg iron in the last two trimesters of pregnancy in order to increase the maternal erythrocyte volume and the fetal erythropoiesis. In case no iron is supplied, deposition of the iron (ferritin) is consumed between weeks 12 and 25 in most of the pregnant women in order to increase the erythrocyte volume.²⁰ Maternal anemia, also, declines the fetal iron depositions. Anemia has negative effects on the fetal development, therefore maternal anemia must be prevented and treated.

IOM recommends that all pregnant women should be given elementary iron 30 mg/day during the second and third trimesters in order to avoid any iron deficiency anemia during pregnancy. Recommended dose for pregnant women with anemia is 60-120 mg/day. The risk for anemia is described as follows; hemoglobin being under 11

gr and hematocrite under 33% during the first and third trimesters, and hemoglobin being under 10.5 gr and hematocrite under 32% during the second trimester. 15 mg zinc and 2 mg copper supplements should be included in the diet of women taking therapeutic doses since the iron interferes with the absorption of those minerals. Due to the slight increase in the iron needs during the first 16 weeks of gestation, no supplement for iron is required in the first four months. Also, iron treatment given during the first trimester has aggravating effect on nausea and vomiting during pregnancy. In case the Hb is less than 11 gr, which is assessed at gestational weeks of 22-24 under normal conditions, prophylactic iron preparation can be used.

Furthermore, all pregnant women should be encouraged to eat foods rich in iron (chicken, fish, leafy vegetables, whole wheat bread, enriched bread and cereals), and they should also be informed that animal protein and ascorbic acid supplements enhance the absorption of iron. Tea and coffee shouldn't be consumed immediately after the meals. Excessive consumption of calcium and magnesium salts decrease the absorption of iron.

Calcium

Results on the role of calcium intake in preventing or treating the preeclampsia is highly controversial, and no sufficient data is available yet. Daily calcium requirement of women aged 19 to 50 years is 1000 mg/day while it is 1300 mg/day for those aged under 18.²¹ It has also been shown that calcium requirements during pregnancy are similar to those in the nonpregnant state.²² Daily consumption of three portions of food rich in calcium is sufficient to meet the daily requirements. Lower intake of calcium means an intake of 600mg/day (i.e., only one portion consumption of calcium-rich food and non-consumption of dairy products).

Folate

Folate is essential in the nucleic acid synthesis, and plays an important role in increasing the erythrocyte volume and meeting the requirements of growing uterus, placenta and fetus. Insufficient intake by diet and maternal genetic factors result in lower folate levels. In populations with poor gestational outcomes, it has been observed that

micronutrients like folate are not consumed much. Smoking, alcohol intake and long-term use of oral contraceptives decrease the maternal folate levels, which are associated with increased risk of preterm delivery and fetal growth restriction.

Foods like strawberry, broccoli and leafy vegetables are rich in folate.

Zinc

Zinc has a significant role in biochemical reactions. Therefore, adequate zinc levels are required for sufficient development and growth. Although some studies showed that lower maternal zinc levels may result in poor gestational outcomes, absence of a biochemical indicator showing the zinc levels prevents efficiency of studies. Zinc absorption may be declined in pregnant women with higher dose of iron intake and gastrointestinal disease, smokers and alcoholics; in such cases, zinc supplement may be given.

Fluorine

In a randomized controlled study, protective role of prenatal fluorine supplement on the tooth decay couldn't be shown with a follow-up up to 5 years of age. Consequently, fluorine supplement during pregnancy is still a controversial subject.²³

Multi-Vitamin Supplement During Pregnancy

Daily amounts of energy, protein, vitamin and minerals required for non-pregnant women aged 19 to 50, as well as pregnant and breastfeeding women have been announced by a bulletin (Recommended Daily Allowances (RDA) published in 1989 by the National Research Council Food and Nutrition Board in the U.S.⁷ Recommended amounts are not for personal needs, they only serve to guide as a social basis because nutrient requirements may vary from person to person. Use of prenatal vitamin and mineral preparations may make one person to consume some of the nutrients over the recommended amounts (RAD). Particularly, high doses of iron, zinc, selenium, vitamins A, B6, C and D may cause some toxic effects. In a study by Rothman et al. on 20,000 pregnant women, intake of Vitamin A exceeding 15,000IU/day was closely associated with birth defects.²⁴ Also, failure to adjust blood

glucose levels in diabetic patients, and blood phenylalanine levels in women with phenylketonuria during periconceptional period results in poor gestational outcomes.²⁵⁻²⁶

American Academy of Pediatrics and ACOG indicate that recommended RDA doses should not

Table 2. Recommended dietary allowances (RDA).**

Food	Non-pregnant	Pregnant	Increase (%)	Breastfeeding
Energy	2200 kkal	2500 kkal	+14	2640 kkal
Protein	50 mg	60 mg	+20	65 g
Vit A	800 µg	800 µg	0	1300 µg
Vit D	5 µg	10 µg	+100	10 µg
Vit E	8 µg	10 µg	+25	12 µg
Vit K	-	65 µg	-	65 µg
Vit C	60 mg	70 mg	+17	95 mg
Tiamin	1.1 mg	1.5 mg	+36	1.6 mg
Riboflavin	1.3 mg	1.6 mg	+23	1.8 mg
Niasin	15 mg	17 mg	+13	20 m
Vit B6	1.6 mg	2.2 mg	+37	2.1 mg
Folate	180 µg	1 g		280 µg
Vit B12	2 µg	2 µg	+10	2.6 µg
Calcium	800 mg	1200 mg	+50	1200 mg
Phosphore	800 mg	1200 mg	+50	1200 mg
Mg	280 mg	320 mg	+14	355 mg
Iron	15 mg	30 mg	+100	15 mg
Zinc	12 mg	15 mg	+25	19 mg
Iodine	105 µg	175 µg	+17	200 µg

(**) National Research Council (NRC). Recommended Dietary Allowances, 10th ed. Washington DC: National Academy Press, 1989.

be exceeded more than two-fold during pregnancy, and they don't encourage routine multivitamin supplement.²⁸ In 1990, the Institute of Medicine stated that all vitamin and mineral requirements, except iron, during pregnancy can be met by a balanced diet, and routine vitamin supplement, except iron, is unnecessary. After that, U.S. Centers for Disease Control and Prevention recommended that all women of childbearing age with a potential to give birth should use 0.4 mg folic acid per day, following the introduction of the fact that periconceptional folic acid supplement reduced the occurrence of neural tube defects half and half.²⁹ Also, it has been recommended that the supplement should be 4 gr in women who have previously delivered an infant with a neural tube defect.³⁰ Further studies are needed to reveal if the preconceptional intake of other vitamins is effective in reducing some other birth defect.³¹ Evidence

from observational studies indicates that multivitamin-mineral supplement used before conception and during pregnancy reduces birth defects and poor gestational outcomes. Some observational studies showed that vitamin-mineral supplement initiated during first or second trimester resulted in a two-fold reduction in the risk for preterm delivery and possibility of lower birth weight.³²

Although amount of scientific evidence revealing that routine vitamin supplement improves gestational outcomes is insufficient, it has been already shown that multivitamin-mineral supplement significantly reduced the preterm delivery and number of lower birth weight infants in adolescent pregnancies with severe insufficient nutrition.³²

The Institute of Medicine and ACOG declared that routine vitamin supplement during pregnancy is unnecessary. However, both institutions stated that daily dietary habits of each pregnant woman should be evaluated, and a multivitamin supplement should be given at the beginning of the second trimester in case of insufficient food intake and inclusion in high-risk category (Table 3).⁹ Furthermore, vegan pregnant with low calcium intake should be supplemented by nutrients recommended by IOM as shown at Table 4.

In a study by Siega-Riz in 2002 on pregnant women in the North Carolina, it has been revealed

Table 3. Nutritional risk factors during pregnancy***

Prepregnancy weight very lower than ideal weight
Insufficient weight gain
Adolescent pregnancy, particularly within first 2 years of menarche
Psychological, social, cultural, religious and economic factors that may lead to insufficient nutritional status
Obstetrics problems like previous delivery of low birth weight infant
Chronic diseases like diabetes, thyroid, PKU and sickle cell anemia
Multi-pregnancy
Eating disorders
Pica
Food allergy or intolerance

(***) Institute of Medicine. Nutrition During Pregnancy. Part I Weight Gain. Washington, DC: Food and Nutrition Board. National Academy of Sciences, 1990

that recommended iron intake only by diet has been met only in 30% while folate intake only in 60% of pregnant women.³³ This shows that American women, even they have high income

Table 4. Recommended vitamin and mineral supplements by IOM*****Multivitamin-mineral preparations recommended for pregnant women with insufficient diet intake or nutritional risk factors:**

Iron	30 mg
Zinc	15 mg
Copper	2 mg
Calcium	250 mg
Vit B6	2 mg
Folate	300 µg
Vit C	50 mg
Vit D	5 µg

Multivitamin-mineral preparations recommended for pregnant women with specific conditions: Vegans

10 µg (400 IU) Vit D
2 µg Vit B12

Pregnant women aged <25 years with a daily calcium intake <600 mg
600 mg calcium

(***) Institute of Medicine. Nutrition During Pregnancy. Part I Weight Gain. Washington, DC: Food and Nutrition Board. National Academy of Sciences, 1990

levels, cannot meet their nutritional requirements only by food, and a significant portion of pregnant women needs to be supplemented by multivitamins. However, compliance studies displayed that approximately 1/3 of pregnant women didn't take their prescribed multivitamins. It was found out that younger women with low education levels used multivitamins less.³⁴

In conclusion, it should be clearly highlighted that multivitamin preparations meet only a part of the required nutrients, not all of them, even when the pregnant women are given multivitamin supplement; and they can never replace a healthy diet. Pregnant women should be advised about balanced and multi-nutrition, and their eating habits should be evaluated. All pregnant women should be given folate supplement during periconceptional/early pregnancy period. All nutrients with increased requirement during pregnancy except iron and folate can be met by diet, raising the consciousness about balanced diet (if the patient has no nutritional risk factor).

Exercise During Pregnancy

Excessive weight gain during pregnancy and being unable to lose that excessive weight at postpartum 6 months results in long-term obesity.³⁶ Exercise and balanced diet ensure weight gain recommended during pregnancy. Exercise during pregnancy reduces risk for gestational diabetes

and long-term obesity, and provides background for a faster labor and more rapid improvement, increasing posture, muscle tone, strength and endurance.³⁷ Exercise is also good for lumbago, gas, and swelling at foot, which are among the most frequent complaints of pregnancy.³⁸ However, pregnant women should take an extra calorie of 300 kkal/day when practising exercise.³⁹ Approach to exercise during pregnancy have been changing within years. In 1985, ACOG recommended to practise aerobic exercises not exceeding 15 minutes, and the heart rate to be at 140 at m/min.⁴⁰ And, ten years later the same committee stated that women with uncomplicated pregnancy can have similar exercise level with non-pregnant women.⁴¹

Physiological Effects and Adaptations Cardiovascular System

Cardiac output increases by 50%, and heart beats 15 times more than the resting heart rate, and blood volume rises 45%. Due to the increased capacity of veins, blood pressure declines, vasodilation occurs at the skin and tendency to hyperthermia is reduced as a result of heat loss.⁴²

It has been suspected that increased blood flow diverted to the muscles during the exercise may cause less blood pumping to the uteroplacental unit. However, compensatory changes caused by exercise such as increase in the maternal hematocrite and oxygen extraction help maintenance of the fetal oxygenation.⁴³ Fetal heart rate increases by 5-15 beats for a short period of time, and doesn't impose any risk for the fetus. Unless an obstetrics or medical complication arises, no episodes of fetal brachycardia occur.⁴⁴ However, supine position should be avoided after the first trimester since this position reduces the maternal cardiac output. Also, it has been shown that the uterine blood flow declines in women living in upland regions.⁴⁵ It is recommended that women living in heights exceeding 2500 meters should avoid physical activities at least until 4-5 days are completed.^{46,47}

Metabolic

It is known that maternal core temperature exceeding 39.2 degrees have potential teratogenic effects during the first trimester.⁴⁸ Increased ventilation and skin blood flow are the adaptive

changes protecting from hyperthermia during pregnancy.⁴⁹ Yet, adequate hydration should be provided and exercising in very hot/humid ambiances should be avoided as precautions.⁴¹

Due to the restricted expansion of the diaphragm and increased needs of fetal oxygen during pregnancy, the VO₂ max significantly declines during the exercise compared to the non-pregnant state.⁴⁴ Consequently, carbohydrates are used more (as shown by indirect calorimeter). Thus, in extended (>45 min) or more exerted exercises, plasma glucose concentrations are significantly reduced. Therefore, during exercise, sufficient calorie intake and exercising time not exceeding 45 minutes should be recommended in order to minimise the risk for hypoglycemia.

Musculoskeletal System

Changes related to the musculoskeletal system of the pregnant women increase the risk of injury during exercise. As growing breasts, uterus and fetus increase the lumbar lordosis, center of gravity shifts forward and increased weight contributes to the back; hormonal changes lead to increased laxity and mobility in the joints.⁵¹ Based on these, all exercises during pregnancy should be performed moderately and without weight bearing on the joints.

Effect on Fetus

Birth Weight

The information on the fetal birth weight of exercising women is contradictory. In a study by Clapp JF in 1990, it was shown that birth weight was significantly reduced when the pregnant women increased their activity level over 50% compared to their activity level before conception. In another study by Sternfeld, no difference was found between birth weights when exercising and sedentary pregnant women were compared. In a prospective study on 800 pregnant women by Hatch et al., the pregnant women who exercise with a total calorie expenditure of 2000 per week delivered infants with higher birth weight compared to the non-exercising women.⁵³ A study by Pivarnik in 1998 concluded that: "Available data shows that moderate-intensity physical activities performed throughout the pregnancy may have beneficial effects on the birth weight", however, it

should be kept in mind that heavy exercise schedules may result in lower birth weights.⁵⁴

Duration of Pregnancy

It has been suggested that increased secretion of norepinephrine and prostaglandine during the exercise may activate the uterine and stimulate a premature delivery. However, number of studies related to this subject is very restricted. A study by Hatch carried out in 1998 reported that there was a reduction in the risk for preterm delivery, comparing 876 pregnant women with an energy expenditure of over 1000 kkal per week by aerobic activity with a group of non-exercising women. Therefore, it was concluded that exercising during pregnancy is safe.

Effect on Mother

Course of Pregnancy

It was observed that symptoms like nausea, fatigueness and lumbago are reduced in exercising pregnant women. In an observational study on 398 pregnant women, an inverse association was found between exercise and symptoms.

Labor and Delivery

The effect of exercise on labor is unclear. Many women indicated that they felt more energetic associated with exercise, and thus labor was easier. In an uncontrolled and non-randomized study, it was found that the delivery period was shortened in exercising women compared to the non-exercising women. In a study by Pomerance in 1974, it was observed that exercising multiparous women had shorter delivery period; but, this effect was not found in primiparous women. However, some other studies found no correlation between exercise level and labor period.

Exercise and Gestational Diabetes Mellitus (GDM)

American Diabetes Association (ADA) recommends exercise as a part of treatment in case euglycemia is not restored by diet in GDM. A randomized study by Jovanovic in 1989 compared patients who used diet alone with patients who did aerobic arm exercise. And, at the end of week

6, levels of hemoglobin A1c, fasting plasma glucose, and satiety blood glucose were reduced in the exercising group, while no improvement occurred among the controls. Another study by Bung et al in 1991 used an exercise schedule with higher output and achieved normoglycemia at week 1.

Overall Recommendations on Exercise

Pregnant women who previously have a sedentary lifestyle should be encouraged to start exercising. As a start, sports with low injury risk like walking and swimming not exceeding 20-30 minutes daily can be recommended while pregnant women who have been already exercising are recommended to unchange their schedule.

During exercises, following precautions should be taken:

1. Training schedule should have a regular basis.
2. Exercise should be stopped when deoxygenation symptoms like excessive fatigue, dizziness, shortness of breath develop.
3. Exercise should be performed in cool ambiances, and dehydration should be avoided in order to prevent excessive heating.
4. Long lasting exercising in supine position should be avoided during the second and third trimesters.
5. Contact sports and diving should be avoided.
6. Calorie intake additionally required for exercise must be strictly followed (mean 300 kkal/day)

The contraindications indicated by ACOG in 1994 are as follows:

1. Intrauterine growth retardation
2. Persistent vaginal bleeding
3. Incompetent cervix or cerclage placement
4. Preterm labor risks
5. Rupture of membranes
6. Hypertension triggered by pregnancy
7. Severe chronic medical diseases

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Retrospective Analysis of the 126 Cases Terminated in Pregnancy by the Ethical Committee Decision

Nurten Akdeniz, Ahmet Kale, Mahmut Erdemoğlu, Ahmet Yalınkaya, Murat Yayla

Department of Gynecology and Obstetrics, Faculty of Medicine, Dicle University, Diyarbakır

Abstract

Objective: To evaluate ethical committee decisions on pregnancy terminations, according to indications and gestational ages.

Methods: Terminated 126 fetuses among 131 pregnancies admitted for consultations to the ethical committee during four years were evaluated retrospectively for clinical findings, indications and gestational age. Gestational weeks were grouped as 5-10 weeks, 11-24, 25-28 and over 28 weeks respectively. ANOVA and Chi square tests are used in statistical analyses.

Results: Termination request was rejected in 6.87% of the cases, while four of them were twins. Four single twins after selective fetocide and 122 singleton fetuses were terminated. Mean gestational age was 19.09 ± 7.05 weeks in terminated cases. Eighty-four pregnancies were terminated because of the fetal causes (66%), and 42 of them of the maternal causes (33%). The most frequent fetal causes were anomalies of the central nervous system (41%) and fetal chromosomopathies (14%) respectively. Pregnancy termination due to fetal causes was performed especially between 11-24th weeks of pregnancy ($p < 0.001$). Maternal diseases (61%) and teratogenic medication (33%) were the most common maternal causes and termination of pregnancy due to these causes was performed especially between the 5-24th gestational weeks.

Conclusions: Termination of pregnancy or fetus is performed at a mean gestational age of 19 weeks, and especially according to fetal causes in this series. The termination request was rejected in 7% of the cases. Selective fetocide was the preferred method in cases of anomalous twin pair. Terminations due to maternal causes were done before the period of fetal viability, while terminations due to fetal causes were ranged mostly in the second trimester.

Keywords: Termination of pregnancy, ethics committee.

Etik kurul kararıyla gebelikte tahliye edilen 126 olgunun geriye yönelik değerlendirilmesi

Amaç: Tıbbi tahliye etik kurul kararlarının, endikasyonlara ve işlemin yapıldığı gebelik haftasına göre değerlendirilmesi.

Yöntem: Dört yıllık süre içinde hekimlerce gebelik tahliyesi etik kuruluna yönlendirilen 131 hasta içinden, gebeliği veya fetusu sonlandırılan 126'sı, klinik bulgular, uygulama endikasyonları ve gebelik haftası yönlerinden etik kurul kayıtları temel alınarak retrospektif olarak değerlendirildi. Gebelik haftaları 5-10, 11-24, 25-28 ve 28 üzeri olarak gruplandırıldı. İstatistiklerde ANOVA ve Ki-kare testleri kullanıldı.

Bulgular: Kurula yönlendirilen olguların %6.87'sinde gebelik sonlandırması isteği uygun görülmemiş, bunların ikiz olan dördünde selektif fetosid ile gebeliğin devamı sağlanmıştı. Sonlandırılan diğer 122 olgu tek gebelikti. Olgular ortalama 19.09 ± 7.05 haftada sonlandırılmıştı. Olguların %66'sında (n:84) tahliye endikasyonu fetal, %33'ünde (n:42) ise maternal nedenlerden kaynaklanmaktaydı. Fetal nedenler içinde merkezi sinir sistemi (%41) ve kromozom anomalileri (%14) önde gelirken, tahliyeler en sık 11-24. gebelik hafta aralığında uygulanmıştı ($p < 0.001$). Anneye ait nedenler içinde anne hastalıkları (%61) ve teratojen ilaç kullanımı (%33) önde gelirken tahliyeler en sık 5-24. gebelik haftaları arasında uygulanmıştı.

Sonuç: Kliniğimizde gebelik veya fetus sonlandırmaları daha çok fetal nedenler ile, ortalama olarak gebeliğin 19. haftasında yapılmıştır. Sonlandırma taleplerinin yaklaşık %7'si uygun görülmemiştir. İkizlerden birinde anomali saptanan olgularda gebelik sonlandırması yapılmamış, fetosid tercih edilmiştir. Anneye ait nedenler ile sonlandırma işleminin fetal yaşam sınırından önceki dönemde, fetusa ait nedenlerin ise genelde ikinci trimesterde yapıldığı gözlenmiştir.

Anahtar Sözcükler: Gebelik tahliyesi, etik.

Introduction

Termination of pregnancy is a complex topic with a wide spectrum of arguments and various conceptions and beliefs. Even the laws regulating the termination of pregnancy are varied from country to country.¹ In our country, a normal pregnancy can be legally terminated until the completion of the gestational week 10 by the consent of both parents. In case the gestational week is over 10 weeks and there is a maternal threat or a possibility of severe disability for the infant to be born and the next generations, then current pregnancy can be terminated provided that a justified report based on objective findings by an obstetrician and an expert from the related field is provided.² Legislation on this subject is included in the "Regulations for the Execution and Supervision of the Termination of Pregnancy and Sterilization Services" dated 1983.³

Among medical researchs carried out in our country, practices in the centers implementing termination of pregnancy and characteristics of the cases are randomly reported, and when the daily practices are taken into consideration, there seems to be an overall lack of restriction about the termination of pregnancy.⁴ It has been emphasized that a new legal regulation is required in order to remove the differences in the approach between the physicians and institutions.¹

Our objective was to retrospectively evaluate the decision mechanisms, indications and gestational weeks of medical interference for the termination procedures of pregnancy carried out in our clinic.

Methods

131 cases who presented to the polyclinic, demanding or proposing termination of the pregnancy between May 2000 and August 2004, and who were accordingly consulted to the Ethical Committee of the Obstetrics Department were retrospectively evaluated. Ethical Committee consisted of an expert of the field related with the finding or disease underlying the indication (pediatrics, pediatric surgery, brain surgery, etc.) as well as two obstetricians. Demographic characteristics, gestational weeks, indications, justifications for

rejection and interventions of the pregnancies evaluated by the Committee have been reviewed from the records of the Ethical Committee. Based on the gestational week the pregnancy was terminated, cases were divided into four groups: Group I, gestational weeks 5-10; Group II, gestational weeks 11-24; Group III; gestational weeks 24-28; and, Group IV, gestational week 29 and over. Data were statistically compared by using ANOVA and Chi-square test, and value of $p < 0.05$ was considered statistically significant.

Results

Of 131 cases who were consulted to the Ethical Committee of the clinic between May 2000 and August 2004 for termination, 122 were approved and pregnancy was terminated (93.13%) while request in five cases was rejected (3.82%), and in four cases who were twins, the pregnancy was not terminated, but maintained through selective fetocide (3.05%).

Reasons for rejections were as follows: viability of pregnancy (n:2); maternal disease not requiring termination of pregnancy (n:1); and low possibility of endangering the fetus by factors incurred during pregnancy (n:2) (Table 1). Of all pregnancies, 126 was terminated after receiving the written consent of all parents. Termination of pregnancy was carried out by vaginal misoprostol, dilatation and curettage in pregnancies earlier than the week 10. After the week 10, vaginal misoprostol was used, and when required, aspiration-evacuation-curettage were used. For terminations after the week 24, oxytocin infusion based on the Bishop score, cervical Foley catheter or vaginal misoprostol were used, followed by oxytocin induction.

It was observed that in all cases, maternal and/or fetal causes had been detected before the termination of the pregnancy, and in cases the pregnancy was maintained, couples had been acknowledged about the potential maternal and/or fetal risks. The mean age was 29.24 ± 7.26 years; gravida 4.22 ± 2.61 ; parity 2.53 ± 2.26 ; abortus 0.66 ± 1.16 ; and live birth 1.81 ± 2.00 . The epidemiological data of the groups is shown at Table 2. There was no statistically significant difference between the groups in terms of maternal age, pregnancy, labor, abortus and live infants. Vaginal

Table 1. Features of pregnancies rejected by the Ethical Committee.

	Age	Gestation	Parity	Gestational week	Reason for termination request
1	37	12	7	32	Cystic hygroma
2	37	2	-	28	47, XXX
3	27	1	-	25	Preeclampsy
4	39	5	3	13	Use of Azatiopurine+Prednizolone
5	19	1	-	11	History of urolythiasis + fluoroscopy
6	21	1	-	17	Twins + 45 XO
7	25	2	1	17	Twins+ Anencephaly
6	28	5	3	19	Twins+ Encephalocele
9	30	4	2	24	Twins+ Agenesis of corpus callosum

Table 2. Epidemiological data of the terminated groups.

	5-10 GW	11-24 GW	25-28 GW	> 28 GW	Total	P
Number of cases	18 (%14.28)	78 (%61.90)	20 (%15.87)	10 (%7.93)	126	-
Pregnancy	4.27±2.39	4.26 ± 2.61	3.52 ± 2.29	5.20 ± 3.48	4.22 ± 2.61	0.43
Labor	2.38±2.14	2.49 ± 2.25	2.31 ± 2.31	3.50 ± 2.63	2.53 ± 2.26	0.56
Abortus	0.72±1.27	0.84 ± 1.26	0.15 ± 0.50	0.20 ± 0.63	0.66 ± 1.16	0.07
Live birth	2.22±1.86	1.81 ± 2.11	1.73 ± 2.07	1.20 ± 1.22	1.81 ± 2.00	0.64
Mean age	31.72 ± 7.82	28.96 ± 7.64	28.31 ± 6.19	28.70 ± 4.66	29.24 ± 7.26	0.46

GW: Gestational week

method was chosen, and termination was successful in all cases. The mean gestational week was 19.09 ± 7.05 in terminated cases. The rate of terminations after the week 10 was 14.28% while it was 85.72% for the ones after the week 10. The decision for termination was given after the week 24 in 23.8% of the cases.

Eighty-four cases were terminated because of fetal anomalies (66.66%) in the series reviewed, where the most frequent causes were central nervous system (n:35, 41.66%) and chromosome anomalies (n:12, 14.29%) (Table 3) ($p < 0.001$). Central nervous system anomalies included hydrocephaly (n:11; Down syndrome in three), ventricu-

Table 3. Fetal causes and gestational weeks (GW) in terminated cases.

	5-10 GW	11-24 GW	25-28 GW	> 28 GW	Total
Central nervous system anomaly	-	23	9	3	35
Chromosome anomaly	-	11	1	-	12
Non immun hidrops fetalis	-	6	2	2	10
Cystic hygroma	-	3	1	1	5
Urinary system anomaly	-	2	1	1	4
Skeletal system anomaly	-	2	1	1	4
Cardiac anomaly	-	1	1	1	3
Anhidramniyos	-	2	-	-	2
Other	-	7	1	1	9
Total	-	57 (%67.86)	17 (%20.24)	10 (%11.90)	84 (%100)

Table 4. Maternal causes and gestational weeks (GW) in terminated cases.

	5-10 GW	11-24 GW	25-28 GW	> 28 GW	Total
Advanced heart disease, hypertension	7	8	1	-	16
Use of teratogen drugs	7	6	-	-	13
Chronic renal disease, dialysis	-	5	-	-	5
Siroz, kronik aktif hepatit	2	-	-	-	2
Other	2	3	1	-	6
Total	18 (%42.86)	22 (% 52.38)	2 (%4.76)	-	42 (%100)

lomegaly and spina bifida (n:9), anencephaly (n:9), encephalocele (n:5), microcephaly (n:2), intracranial mass (n:1), agenesis of corpus callosum (n:1). Chromosome anomalies consisted of trisomy 21 (n:8), trisomy 18 (n:2), trisomy 13 (n:1) and 45 XO (n:1). Other malformations included non-immun hydrops fetalis, large cystic hygromas, polycystic kidneys and agenesis of corpus callosum, lethal achondroplasias and cardiac anomalies concomitant with large septal defect or ventricular hypoplasia and multiple anomalies.

Pregnancy termination due to fetal causes was performed in 53 cases (63.09%) especially between the weeks 11 and 24. No pregnancy was terminated in the early period (weeks 5-10) due to fetal causes.

Forty-two of the terminated cases (33.33%) had maternal causes. Among them, the leading ones were maternal diseases (61.90%) and use of teratogen drugs (33.33%). Pregnancy termination due to maternal causes was most frequently performed between the weeks 11 and 24 (n:22, 52.38%) and the weeks 5 and 10 (n:18, 42.86%) (Table 4). One of the two cases who were terminated after the gestational week 24 had been diagnosed with severe pulmonary hypertension, and the other with severe preeclampsia. No termination was found during the last trimester of the pregnancies.

Table 5. Distribution of terminations due to maternal and fetal causes by gestational weeks.

Gestational week	Maternal cause	Fetal cause	Total
5-10	18 (%100)	-	18
11-24	22 (%27.85)	57 (%72.15)	79
25-28	2 (%10.53)	17 (%89.47)	19
> 28	-	10 (%100)	10
Total	42 (%33.33)	84 (%66.66)	126

Twenty-two of the cases who had been terminated between the gestational weeks 11 and 24 had maternal causes while 57 cases had fetal causes. Pregnancy termination weeks due to maternal and fetal causes were statistically different ($p < 0.05$). Terminations due to maternal causes were performed in earlier weeks while the ones due to fetal causes in advanced weeks (Table 5).

Discussion

Termination of pregnancy is a difficult decision to make for both the parents and the physician. When a fetus is diagnosed with an anomaly/disease during the intrauterine period, community and parents may have a tendency to terminate the pregnancy, but such a tendency may violate some rights of the fetus because here the aim is to destroy the fetus and act accordingly. A decision which may seem right to the physician and the parents may be contradictory to the social beliefs, state's laws, universal law codes, even to the medical discipline. Therefore, it is necessary to form some committees for decision-making in order to prevent any arbitrary decisions. Such committees are usually called "Ethical Committee for Termination of Pregnancy". Comprising at least three experts, this committee has to demand any document and finding, and present and file detailed approval forms. Several professional groups like law experts, sociologists, scientists, religious scientists can be involved in the decision making together with the physicians in the ethical committees in the western countries. 4 Such formations are effective in taking the ethical and right decisions in the termination of pregnancies.

In Turkey, pregnancies can be legally terminated until the end of the gestational week 10 upon request of both parents. 2 As the termina-

tions of pregnancy based on laws are carried out in safer conditions, maternal complications associated with abortus are reduced. It is well known that particularly deaths due to miscarriage are decreased following the related code enacted in our country in 1983.² Again, in our country decisions for termination of pregnancy are usually made by an obstetrician and parents since no multidisciplinary structure is available in general terms. It is a fact that the legislative clause "...an expert from the related field is provided" is not applied all the time. Furthermore, no limit for gestational week is enforced for the termination of pregnancy in the related legislation, and indications are described unnecessarily broad.¹

Instead, each anomaly case and pregnancy termination should be gathered in a regional, then a national center accompanied with its justification and related documents so that rights of the fetus could be protected by means of execution of the law and related ethical codes.¹ In the near future, such legislations and regulations shall be rearranged according to the Compliance with the EC Regulations.

Limit of viability is 22-24 week's gestation for neonates. General approach adopts offering the choice of pregnancy termination to the parents in case of presence of a malformation conflicting with a healthy life in the fetus who has not achieved viability yet.¹ Physicians' interpretation about the termination of pregnancy in case of fetal anomaly may largely differ even before that period.⁴ Although it has been reported that termination of pregnancy is rarely accepted by the physicians in the presence of a fetal anomaly in some countries, the approach in our country may end up in a status against the fetus.⁴

In our clinic, the decision to terminate a pregnancy can only be made by the approval of at least two obstetricians, one physician from the related field, and parents. In the series we reviewed, the most frequent indications for termination of pregnancy were fetal anomalies in the central nervous system, followed by chromosome anomalies and hydrops fetalis respectively. In a study, it was reported that 20% of 657 terminated pregnancies due to fetal causes after the gestational week 14 was associated with cardiac anomalies.⁵ The cardiac anomaly was present only in three (3.7%) of 80 terminated pregnancies due to fetal causes in

our study. We believe that this is a result of the inefficiency in the early diagnosis of cardiac anomalies. In the same study, 46.1% of cases had central nervous system anomaly.⁵ Similarly, we have found a rate of 41.6% for central nervous system anomalies.

Fetal causes were two-fold of maternal causes in the series we reviewed. 66.66% of the pregnancy terminations due to fetal causes were at gestational weeks 11-24 while 33.33% at a later period. In a study carried out in Australia, Dickinson et al. reported a rate of 13.2% for late termination of pregnancies (>24 weeks) due to fetal anomalies.⁶ In France, the rate for late termination of pregnancy (>24 weeks) due to fetal causes was reported to be 37%.⁷ Our results are slightly lower than the results reported for France. We believe that this is associated with the wide range enforced by the law in our country and higher limit of viability (>28 weeks) applied in our clinic.

In case a defect was detected in twin pregnancies, fetocide usually produces promising outcomes in non-monochorionics.⁸ Proposing a selective fetocide to the parents seems to be a rational approach in early detected anomalies as well as admitting the autonomy of the parents and termination request. In the series we reviewed, four cases with twin pregnancy were not terminated, instead they underwent selective fetocide.

In our series, maternal causes for termination were found in the first two trimesters while no decision was made for termination during the last trimester. It indicates that some clinic practices were performed without any consultation to the Ethical Committee. Such practice which can be excused under emergency conditions to some extent may cause problems in case of loss of the premature fetus during the neonatal period or of advanced morbidity. Therefore, implementing each intervention based on duly decision-making in detail, and consulting to the Committee when necessary may not prevent emergence of medico-legal problems, but facilitate the resolution and prevent violation of the physicians' rights.

In conclusion, within the period reviewed it was found out that medical terminations carried out in our clinic were more frequently resulting from fetal causes, and maternal causes was responsible only for 33% of terminations. In all of the terminations, approval from at least two obstetrician,

one physician from the related field and parents was obtained; vaginal method was chosen and succeeded in all cases. None of the twin pregnancies with single anomaly was terminated, and selective fetocide was preferred. Pregnancies had been terminated at mean 19 week's gestation, and it was observed that because of the uncertainty in the law and legislation, decisions for termination could have been made for weeks 24-28.

Prenatal diagnosis should be completed before the gestational week 24 in order not to force the ethical limits for terminations. When a fetal cause is detected in pregnancies which exceed the limit of viability, the decision should be conservative if the conditions allow, however if maternal causes are severe, then the decision should be made in favor of the mother. Such decisions should be made by a committee formed, and records must be carefully kept. Hospitals and clinics which have no such committees yet must be immediately organized, and decide on terminations in that specific region. Obstetricians should not misinterpret the articles of the regulation, and should not make decisions on their own. Shared responsibility and exchange of ideas will secure a clear conscience as well as preventing wrong decisions. Furthermore, in addition to the presence of an experienced and objective member, involvement of an expert from

each field including the obstetrician alternately in the ethical committee for pregnancy terminations to consult when necessary shall contribute to the communication, coherence and experience within the organization.

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Distribution and Incidence of Congenital Malformations in a University Hospital

Aydan Biri, Anıl Onan, Ümit Korucuoğlu, Bülent Tıraş, Özdemir Himmetoğlu

Department of Gynecology and Obstetrics, Faculty of Medicine, Gazi University, Ankara

Abstract

Objective: It is aimed to determine the incidence and types of congenital anomalies among all neonates in the Department of Obstetrics and Gynecology, Gazi University Faculty of Medicine, between 1988-2005.

Methods: Registries of 17.259 neonates were studied retrospectively. Total malformation incidence, types of these malformations, percentages of isolated and multiple anomalies and their distribution according to gender and maternal age were determined.

Results: 203 anomalies and a 1.18% incidence of congenital malformation was detected. Risk of any anomaly among male fetuses was 1.21% and it was 1.15% among females; and no difference was detected ($p>0.05$). Most common anomaly was meningocele. It was followed by other central nervous system anomalies such as anencephaly and hydrocephaly. 70% of anomalies were isolated and rest were multiple. Risk of having a fetus with congenital malformation varies with age and is most common under 20 and over 40.

Conclusion: Overall congenital anomaly incidence in newborns of our population is 1.18%. Most common anomaly is meningocele, followed by other central nervous system anomalies such as anencephaly and hydrocephaly.

Keywords: Congenital malformation, anomaly.

Bir üniversite hastanesinde konjenital malformasyonların görülme sıklığı ve dağılımı

Amaç: Gazi Üniversitesi Kadın Hastalıkları ve Doğum Anabilim Dalı'nda, 1988-2005 yılları arasında gerçekleşen doğumlarda konjenital anomali tiplerinin ve insidansının belirlenmesi amaçlanmıştır.

Yöntem: Retrospektif olarak incelenen 17.259 doğumda toplam malformasyon sıklığı, bu malformasyonların tipleri, izole ve kombine olarak görülme oranları, anne yaşına göre ve cinsiyete göre dağılımları belirlenmiştir.

Bulgular: Tespit edilen toplam 203 anomali, incelediğimiz popülasyonda, konjenital malformasyonlu fetüs doğma oranının %1.18 olduğunu göstermiştir. Erkek çocuklarda herhangi bir konjenital malformasyon bulunma riski %1.21 ve kızlarda %1.15 olup Ki-kare testi kullanılmasıyla iki grup arasında istatistiksel olarak anlamlı fark bulunmamıştır ($p>0.05$). En sık görülen anomali meningesel olup bunu anensefali ve hidrosefali gibi diğer santral sinir sistemi malformasyonları izlemiştir. Görülen tüm malformasyonların %70'i izole iken geri kalanı multipl konjenital malformasyon olarak görülmüştür. Anomalili bir fetus doğurma riskinin yaşa bağlı olarak değiştiği ve 20 yaşından önce, 40 yaşından sonra sık görüldüğü tespit edilmiştir.

Sonuç: İncelediğimiz toplulukta konjenital malformasyon görülme sıklığı %1.18'dir. En sık görülen anomali meningesel olup bunu anensefali ve hidrosefali gibi diğer santral sinir sistemi malformasyonları izlemektedir.

Anahtar Sözcükler: Konjenital malformasyon, anomali.

Introduction

Incidence of congenital anomalies varies all over the world depending on the genetic factors like chromosome anomalies and single mutation, dietary habits leading to folic acid deficiency, smoking, alcohol and other environmental toxic agents. In the United States of America, where majority of the studies on this subject is conducted, incidence of congenital anomalies has been reported as 2-3 in each 100 delivery¹ whereas prevalence of congenital malformation is 2% in England, 1.2% in Japan and 1.49% in South Africa.^{2,3}

A study conducted all over our country found a prevalence rate of 2% for congenital malformations.⁴ This figure includes only the anomalies detectable during the delivery, and it increases up to 5% especially when the renal/cardiac system anomalies that can be detected after the delivery are combined.⁴ In another study which reviewed the whole number of infants with congenital malformation who were born in 22 university hospitals in Turkey for a period of one year, the ratio of congenital malformation was found 3.65%.⁵ In the same study, it has been reported that although isolated incidence of all malformations in our population is similar to the results reported for several other countries, neural tube defects and cleft lip-palate are more frequent.⁵ Another study conducted by the Department of Obstetrics and Gynecology of Gazi University in 1996 reviewing the birth records for a total of eight years reported a prevalence rate of 1.11% for congenital malformations.⁶

Due to the significance of congenital malformation in perinatal morbidity and mortality and its various types and diverse incidences in several countries, it is important for each population, even on regional basis, to know the distribution and incidence of congenital malformations. Our objective was to determine the incidence, distribution and type of congenital malformations in our hospital, which is a tertiary healthcare provider so that approaches in screening, diagnosis and treatment can be well defined.

Methods

The registries of a total of 17,259 deliveries carried out in the Obstetrics and Gynecology Clinic of the Medical Faculty of Gazi University between

1988 and 2005 were retrospectively examined. Fetuses with antenatal or postnatal congenital malformation were determined by inspecting the birth records and patient files. Parameters included total incidence of malformations, types of the malformations, isolated and concomitant incidences, and distributions by maternal age and gender.

Throughout the follow-up period of pregnancy, triple screen test was conducted between the gestational weeks 16 and 18 as well as ultrasonographic examination at least once at each trimester in order to detect potential anomalies. Patients with an abnormality detected during the ultrasonographic evaluations or with a high risk in the dual or triple test were consulted to the experts on perinatology for detailed ultrasonic examination. If necessary, advanced examination techniques such as chorionic villus biopsy, cordosynthesis and amniocentesis were conducted.

Results

A total of 17,259 deliveries between 1988 and 2005 was examined. Of 17,259 neonates, 8720 (50.54%) were female, and 8538 were male (49.46%). Detection of 203 anomalies in total indicated that prevalence of fetal delivery with congenital malformation was 1.18%. The distribution of those anomalies for both sexes is shown at Table 1. Based on this table, one-hundred-three of 203 anomalies were in girls and a hundred in boys. It corresponds to 50.7% of total congenital malformations in boys, and 49.3% in girls. Ratio of any congenital malformation in neonates was 1.21% for boys and 1.15% for girls, and no statistically significant difference was found between the two groups when compared with Chi-square test ($p>0.05$).

The distribution of congenital malformations in the patient groups reviewed is shown at Table 2.

Table 2 provides type and incidence of 203 congenital malformations. The figure of 203 for anomalies is not similar to the number of fetuses born with congenital malformation as a fetus can have multiple malformations. The most common anomaly was meningocele, followed by other central nervous system malformations like anencephaly and hydrocephaly. When organ system anomalies are classified in general, the most fre-

Table 1. Incidence of congenital malformation by gender.

Gender	Number	Percentage %
Male	104	50.7
Female	101	49.3

Table 2. Distribution of congenital malformations.

Anomaly	Number	Percentage %
Meningocele		25
12.19		
Anencephaly	23	11.21
Hydrocephaly	22	10.73
Cardiac anomalies	17	8.29
Renal anomalies	16	7.80
Pes equinovarus	13	6.34
Encephalocele	10	4.87
Omphalocele	7	3.41
Diaphragmatic hernia	7	3.41
Coanal atresia	7	3.41
Genital anomalies	7	3.41
Gastroschisis	6	2.92
Polidactyly	6	2.92
Hypospadias	6	2.92
Bowel dilatation	6	2.92
Cleft lip	5	2.43
Cleft palate	4	1.95
Syndactyly	4	1.95
Epispadias	4	1.95
Urachus Cyst	3	1.46
Trisomy 21	2	0.96
Trisomy 18	1	0.48
Intestinal atresia	1	0.48
Intracranial mass	1	0.48
Holoprosencephaly	1	0.48
Accessory finger	1	0.48
Total	205	100

Table 3. Distribution of congenital malformations.

	Isolated Anomalies		Multiple Anomalies	
	Number	Percentage %	Number	Percentage %
Central Nervous System	60	29.26	15	7.31
Urinary System	20	9.75	9	4.39
Musculoskeletal System	17	8.29	7	3.41
Cardiovascular System	12	5.85	5	2.43
Gastrointestinal System	10	4.87	4	1.95
Abdominal Wall Defects	7	3.41	6	2.92
Facial Defects	6	2.92	3	1.46
Genital System	5	2.43	2	0.96
Others	7	3.41	3	1.46

Table 4. Comparison of maternal age with incidence of malformation

Maternal Age	Number of anomaly	Percentage %	n (Number of patients)
< = 20	23	2.13	1,077
21 - 30	134	1.00	13,361
31 - 40	31	1.24	2,498
> 40	11	3.39	324

quent ones were the central nervous system anomalies with 82 cases, which were followed by cardiac malformations with 17 cases, renal anomalies and genital system anomalies with 16 cases respectively.

The prevalence and percentage of isolated and multiple malformations in our population are shown at Table 3.

Seventy percent of all malformations were isolated while the rest was multiple congenital malformation. It is notable that 80% of the central nervous system anomalies was isolated, where the other ratios were as follows; 69% for the urinary system, 70.8% for the musculoskeletal system, 70.5% for the cardiovascular system, 71.4% for the gastrointestinal system, 54% for the abdominal wall defects, 66.6% for the facial defect and 71.4% for the genital system anomalies.

We also evaluated the relation between maternal age and incidence of congenital malformation, and found out that fetal deliveries with congenital malformations occurred mostly between 21 and 30 years of age. In percentages, risk for delivering a fetus with anomaly varies with age, and it is more frequent before 20 years of age and after 40 years of age. The results are given at Table 4.

Discussion

Incidence of congenital malformation shows variation among populations depending on the socioeconomic status, dietary habits, geographical regions, races and environmental factors. Its ratio ranges from 1.49% to 3.2% for several countries. In a 13-year-study carried out in Australia (1983-1995), the ratio of congenital malformation was found 3.2% and the most common malformation was the hip dislocation.⁷ In Saudi Arabia, ratio of congenital malformation was found 1.7% in an analysis of 14,762 births.⁸ Seventy-five percent of these anomalies was major anomalies like anencephaly, meningomyelocele, and 25% included minor anomalies like polydactyly, urachus cyst, and the central nervous system was the most involved system. In a study conducted in our university in 1996, incidence of congenital malformation had been reported 1.11% while we found it 1.18%.

It has been reported by studies conducted so far investigating the relation between gender and congenital malformations that the distribution of anomalies had no gender difference. We also found out that gender of fetus, either boy or girl, had no impact on the incidence of congenital malformation, and distribution for both genders is similar.

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The Physical and Psychological Problems of Hospitalized High-Risk Pregnant Women in Partial Bed Rest

Arslan Hediye, Nilüfer Korkmaz

College of Nursery, Marmara University, İstanbul

Abstract

Objective: The pregnant women who have high risk are prescribed partial/complete bed rest in hospital/home by health professionals. Hospitalized pregnant could have different physical and psychological problems which are related to bed rest. This descriptive study was conducted to determine the problems.

Methods: The sample group consisted of high-risk pregnant who had completed 16th gestational week, had partial bed rest in hospital for at least 5 days and were accepted to participate in the study (n=52). An information form, "Antepartum Symptom Report" and "Antepartum Hospital Stressors Inventory" (AHSI) were used for collection of the data. The data were evaluated with the tests of Cronbach (α) consistency coefficients, percentage, mean and correlation distribution.

Results: The pregnant women have lived mild mood changes, moderate tenseness and severe reflux in bed rest period. The pregnant have mostly experimented these stressors according to AHSI: "Thinking about my baby's health" and "Wondering how long I'll be in hospital". The psychological symptoms are related to physical symptoms, obstetric story and age.

Conclusion: Hospitalized high-risk pregnant women have some problems. The pregnant, who have planned pregnancies, have experienced more severe nightmares and sensitiveness than the pregnant who have unplanned pregnancies ($p<0.001$). Level of tenseness and sensitiveness are associated with number of children ($p<0.05$). The nurses, who work in the perinatology services, have to know the problems related to bed rest in order to prevent mother's and baby's health.

Keywords: High-risk pregnancy, bed rest, nursing.

Kısmi yatak istirahati ile hastanede yatan yüksek riskli gebelerin yaşadığı fiziksel ve psikolojik sorunlar

Amaç: Yüksek riskli gebeliklerde, gebeye öncelikle evde veya hastanede, kesin ya da kısmi yatak istirahatına geçmesi önerilir. Fakat özellikle hastanede yatan gebeler, yatak istirahatına bağlı olarak bazı fiziksel ve psikolojik sorunlar yaşamaktadırlar ve çalışmamız, bu sorunları belirlemek amacıyla tanımlayıcı olarak planlanmıştır.

Yöntem: Araştırmamızın örneklemini, 16. gebelik haftasını doldurmuş, en az 5 gündür hastanede kısmi yatak istirahatında bulunan ve çalışmaya katılmayı kabul eden 52 yüksek riskli gebe oluşturmuştur. Verilerin toplanmasında bir hasta tanılama formu, geçerlik-güvenirlik çalışmaları yapılmış "Antepartum Semptom Kontrol Listesi" ve "Antepartum Hastane Stresörleri Ölçeği" kullanılmıştır. Verilerin değerlendirilmesinde Cronbach (α) güvenilirlik katsayısı hesaplaması, yüzdelik (%), ortalama (x) ve korelasyon hesaplamaları kullanılmıştır.

Bulgular: Gebeler, hastanede yatmaya bağlı olarak hafif düzeyde mizaç değişikliği, orta düzeyde gerginlik-sinirlilik ve şiddetli düzeyde reflü yaşamışlardır. Antepartum Hastane Stresörleri Ölçeği'ne göre gebelere en çok stres yaşatan konular "Bebeğimin sağlığını düşünme" ve "Hastanede ne kadar kalacağımı düşünme" olmuştur. Yaşanan psikolojik semptomların fiziksel semptomlarla, obstetrik özelliklerle ve yaşla ilişkisi olduğu belirlenmiştir.

Sonuç: Hastanede yatak istirahatinde olan yüksek riskli gebeler, bazı fiziksel ve psikolojik sorunlar yaşamaktadırlar. Planlı gebeliklerde hastaneye yatma, kabus görme ve daha duygusal olma durumlarıyla ileri derecede anlamlı ilişki göstermiştir ($p<0.001$). Yaşayan çocuk sayısı arttıkça gerginlik-sinirlilik ve daha duygusal olma durumlarında artış gözlenmiştir ($p<0.05$). Perinatoloji hemşirelerinin, hastanede yatan riskli gebelerin yaşaması olası sorunlar hakkında bilgi sahibi olması ve gerekli önlemleri alması, maternal ve fetal sağlığın sürdürülmesi açısından önemlidir.

Anahtar Sözcükler: Yüksek riskli gebelik, yatak istirahati, hemşirelik.

Introduction

High-risk pregnancy is defined as “a physiologic and psychosocial state endangering the life and health of the mother, fetus or neonate, and increasing the risk of morbidity and mortality”.^{1,2} Complications that make a pregnant included in the “high-risk pregnancy” group are several: Anomalies of placenta, incompetent cervix, preeclampsia, preterm labor threat, systemic diseases (diabetes, anemia, infection etc.), Rh incompatibility, intrauterine growth retardation, cervical insufficiency and multiparity.¹⁻⁵

In majority of high-risk pregnancies, pregnant woman is firstly recommended to take a bed rest at home or hospital. Bed rest is frequently recommended for risky pregnancies between 20-36 weeks’ gestation. In the U.S., each year nearly 700,000 pregnant women with high risk are sent to bed.^{1,3,6,7} Benefits of bed rest for high-risk pregnancies are that resting regulates uterus perfusion and fetal circulation; it reduces the pressure on cervix and provides an opportunity to take a rest to the pregnant.^{1,3,8,9}

Despite such benefits, pregnant women who are at bed rest also experience some physiologic and psychosocial side effects. Degree of side effects varies according to the type and duration of the bed rest. The most common physiologic complications of bed rest are as follows: fluid and electrolyte imbalance, reduction in the stroke volume, slow pulse, muscle atrophy, loss of calcium, glucose intolerance, weight loss, increased coagulation factors, reflux, constipation, headache and delayed postpartum rehabilitation.^{1,3,9} And, psychosocial problems related with bed rest are listed as follows: anxiety, low self-esteem, self-blaming, frustration, conflict, sentimentality, crisis, uncertainty, loss of control, boredom and concerns about fetus.^{1,3,4,10-12}

Main causes of psychosocial problems observed in pregnant women with risk include separation from family due to hospitalization, being uncomfortable with hospital atmosphere and other patients, and economic concerns. Any increase in the degree and duration of bed rest would increase the level of problems experienced.^{1,3,4,10,16}

Information about the type and duration of bed rest recommended for high-risk pregnancies is unclear.^{1,16} A national study carried out in the U.S. by Maloni et al. showed that types and duration of bed rest advised by obstetricians in risky conditions vary greatly.⁷

There are three types of bed rest: Type 1: Light bed rest (light housework, part-time working, short-distance walking, two-hours resting within day), Type 2: Moderate bed rest (leaving job, need for assistance for housework, restricted exercise including walking, resting at most part of the day), Type 3: Complete bed rest (staying at bed all day long, eating at bed, only bathroom privileges). Types of bed rest ordered in Turkish hospitals are Type 2 (also known as partial bed rest) and Type 3 (also known as strict bed rest).^{1,3} Bed rests recommended by Sachar et. al. for high-risk pregnancies are also classified as “Light”, “Moderate” and “Heavy”. In this study, the investigators scored the activities during the rest and identified the bed rest range for a high-risk pregnant woman.¹⁷

In any woman who has a pregnancy-related risk, her own health and child’s health are under threat. As already demonstrated by many studies, the psychosocial status of physically high-risk pregnant women is also at risk, and increased anxiety causes development of various complications related with pregnancy and labor (pregnancy related vomiting, pregnancy toxemia, recurrent miscarriage, dystocia, preterm labor etc.).^{2,4,5,13,14}

Nurses taking care of high-risk pregnant women at bed rest should be acknowledged about the physical and psychological problems that women can experience related with the bed rest at pregnancy and apply nursing practices that will prevent or at least minimize such problems. Based on this, we planned to identify and define the physiologic and physical problems that high-risk pregnant women at partial bed rest may experience.

Methods

The field of our study included high-risk pregnant women hospitalized at the Department of Obstetrics and Gynecology of a Social Insurance Institution (SII) hospital in Istanbul between December 2003 and April 2004, and our sampling consisted of 52 pregnant women with high-risk who had completed their 16 weeks' gestation, and hospitalized for partial bed rest at least for a period of five days and accepted to participate in the study. The clinic, location of the study, admits mean 15-20 high-risk pregnancies per month. We've reached to all of the pregnant women who had been admitted to the clinic during our study period and who were complying with our criteria.

For data collection, "Patient Information Form", "Antepartum Symptom Control List" and "Antepartum Hospital Stressors Inventory (AHSD)" were used. Patient Information Form consists of 16 questions to collect data about the demographic, obstetric and gynecologic status of the pregnant women. Antepartum Symptom Control List is a Likert-type form (grading scale), comprising 46 items used for identifying the physical and psychological symptoms of pregnant women at bed rest, which was developed by Maloni in 1993. The Cronbach's alpha coefficient was α 0.79 (35 cases) in the Maloni study; it was found 0.94 (60 cases) in the study by Oskay who translated the form into Turkish and realized its validation; and it was found 0.88 (52 cases) in our study. Antepartum Hospital Stressors Inventory is also a Likert-type scale (grading scale), which was first developed by White &Richie in 1981, and then improved by Maloni in order to evaluate the sources of stress for hospitalized high-risk pregnant women. The stressors were gathered in 7 sub-groups in the scale such as "Separation", "Environment", "Health sta-

tus", "Communication with Health Providers", "Self-image", "Emotional status" and "Family Status". The stress resulting from those stressors were classified as "No stress=0", "Slightly stressed =1", "Stressed =2", "Very stressed=3" and "Extremely stressed=4" depending on their severity. If the stressor is not related, the patient selects "Not applicable for me". The Cronbach's coefficient was found at an interval of 0.61 – 0.93 by White &Richie, of 0.63 –0.93 by Maloni et. al., and of 0.65- 0.83 by Oskay who translated the scale into Turkish and performed its validation. The alpha range was found between 0.62 to 0.87 in our study. For the assessment of data, Cronbach alpha coefficient calculation, calculations of percentage (%), mean (x), standard deviation (\pm SD) and correlation were used.

Results

An analysis of demographic and obstetric characteristics of the pregnant women hospitalized due to partial bed rest showed that 30.79% were aged between 19 and 23 years; 92.30% were not working; 69.24% were graduated from elementary school; 71.6% were willingly conceived; and 71.15% had no other child yet (Table 1). It was shown that during the hospitalization period, the pregnant women received best support from their husbands (80.76%), they mostly communicated with their roommates (86.53%), and they mostly chatted with their roommates during their leisure time (92.30%) (Table 2). At the end of the study, it was found out that 53.84% of pregnant women would have preferred to take their bed rest at home (Table 3).

The most commonly experienced psychological findings associated with hospitalization for pregnant women were mild attitude change (38.46%), moderate tension-nervousness (46.15%), severe boredom (23.08%), moderate nightmare (28.84%) and moderate emotionality (23.08%) (Table 4).

And the most commonly experienced physical findings associated with hospitalization for pregnant women were severe reflux (38.46%), mild pubic pain (48.08%), moderate back pain (38.46%), mild leg pain (44.23%), moderate dry lips (38.46%), mild skin tenderness (46.15%), mild pelvic/pubis pain/ache (53.85%), mild cramp at legs (46.15%), moderate headache (46.15%), mod-

Table 1. Demographic and obstetric characteristics of the participants.

	Feature	n	%	Total
Age	19-23	16	30.79	52
	24-28	12	23.07	
	29-33	12	23.07	
	34 and over	12	23.07	
Occupational Status	Works	4	7.70	52
	Doesn't work	48	92.30	
Educational Status	Literate	4	7.69	52
	Elementary scholl	36	69.24	
	High scholl	9	17.31	
	University	3	5.76	
Status of Pregnancy Willingness	Willing	37	71.16	52
	Unwilling	15	28.84	
Number of Pregnancy	1	32	61.53	52
	2	14	26.94	
Numer of Deliveries	3 and over	6	11.53	52
	0	36	69.23	
	1	6	11.53	
	2 and over	10	19.24	
Miscarriage/Currettage Status	Yes	19	36.54	52
	No	33	63.46	
	0	37	71.15	
	1	7	13.46	
Number of living Children	2 and over	8	15.39	52

Table 2. Features related with bed rest of participants.

	Features	n	%	Total
Previous Hospitalization for this Pregnancy	Yes	10	19.24	52
	No	42	80.76	
Previous Bet Rest at Home for this Pregnancy	Yes	24	46.16	52
	No	28	53.84	
Status of Attendant	Yes	11	21.16	52
	No	41	78.84	
Supporting Persons*	Partner	42	80.76	*
	Parents	34	65.38	
	Children	0	0.00	
	Friends/Neighbour	6	11.53	
Persons Mostly Communicated in the Hospital*	Physician	7	13.46	*
	Nurse	33	63.46	
	Roommate	45	86.53	
Leisure Time Activities*	Handwork	6	11.53	*
	TV/Müzik	4	7.69	
	Reading			
	Chat with room mates	8	15.38	
		48	92.30	

* More than one response.

erate sleeplessness after waking up (38.46%), mild involuntary drowsiness at day time (55.76%) and mild dizziness (59.61%) (Table 5).

According to the Antepartum Hospital Stressors Inventory, the most common stressors for pregnant women were as follows: “anxious about the baby’s well-being” (3.61 points over 4), “anxious about hospitalization period” (3.30 points), “separation from my family” (3.27 points), “concerns about the care of children at home” (3.25 points), “lack of information about my status” (3.18 points), “concerns about labor” (3.16 points), “feeling sad” (3.06 points) and “feeling bored” (3.03 points) (Table 6).

It was also found out that as age advanced and parity increased, concentration was reduced in the high-risk pregnant women participated in our study; again, tension-nervousness was increased as age advanced; women who willingly conceived were more tense, more emotional and had nightmares compared to those who were unwillingly conceived; and tension and emotionality were increased as the number of living children increased (Table 7).

It was also found out that findings for tension-nervousness and being more emotional of “Separation” sub-group in the Antepartum Hospital Stressors Inventory scale, findings for sensorial changes and having nightmares of “Environment” subgroup, findings for tension-nervousness of “Health” subgroup, findings for boredom of “Communication with Health Providers” subgroup and “Self-image” subgroup, findings for attitude change and being more emotional of “Emotional status” subgroup and findings for tension-nervousness of “Family status” subgroup were all related. Significant relations were found between the physical findings and psychological findings experienced by the high-risk pregnant women participated in our study. Reflux was significantly related with tension and boredom; nausea with lack of concentration; pubic pain with tension and being more emotional; pelvic pain/ache with being more emotional; earache, headache and sight problems with lack of concentration; sleeplessness after waking up with attitude change and having nightmares; waking up unrefreshed and dizziness with tension; drowsiness at daytime with tension; tiredness with lack of concentration and sensorial changes, and finally stuffiness with tension (Table 9).

Table 3. Distribution of the responses to the question "Would you prefer taking bed rest at home?"

	Response	n	%	Total	%
RESPONSE	o better take care of my children	14	50.00	28	53.84
	To take a showe	8	28.58		
Yes	I feel irritated at hospital	3	10.71	24	46.16
	My house is very close to the	1	3.57		
	Hospital is annoying	2	7.14		
	I feel safe at hospita	16	66.66		
No	I've been taken better care of	6	25.00	52	100
	I feel more rested at hospital	2	8.34		
Total					

Table 4. Distribution of bed rest associated psychological symptoms experienced by pregnant women.

Psychological Symptoms	Absent		Mild		Moderate		Severe	
	n	%	n	%	n	%	n	%
Difficulty in concentrating	26	50.00	14	26.92	12	23.08	0	0.00
Attitude change	24	46.15	20	38.46	8	15.39	0	0.00
Tension-nervousness	11	21.16	17	32.69	24	46.15	0	0.00
Boredom	8	15.39	15	28.84	17	32.69	12	23.08
Sensorial changes	44	84.61	2	3.84	0	0.00	6	11.55
Nightmares	34	65.40	3	5.76	15	28.84	0	0.00
Being more emotional	37	71.16	3	5.76	12	23.08	0	0.00

Table 5. Distribution of bed rest associated physical symptoms experienced by pregnant women.

Physical Symptoms	Absent		Mild		Moderate		Severe	
	n	%	n	%	n	%	n	%
Indigestion	25	48.08	15	28.84	7	13.46	5	9.62
Reflux	4	7.69	16	30.77	12	23.08	20	38.46
Nausea	21	40.38	9	17.30	13	25.02	9	17.30
Loss of appetite	27	51.92	4	7.69	14	26.92	7	13.46
Pubic pain	3	5.76	25	48.08	16	30.77	8	15.39
Other abdominal problems	40	76.92	12	23.08	0	0.00	0	0.00
Hip pain	29	55.78	20	38.46	3	5.76	0	0.00
Back pain	12	23.08	12	23.08	20	38.46	8	15.39
Leg pain	13	25.02	23	44.23	4	7.69	12	23.08
Pain in the external ear	41	78.85	8	15.39	3	5.76	0	0.00
Low back pain	37	71.15	0	0.00	9	17.30	6	11.55
Rash/erythema	39	75.00	13	25.00	0	0.00	0	0.00
Dry skin	26	50.00	7	13.46	11	21.15	8	15.39
Dry lip	4	7.69	16	30.77	20	38.46	12	23.08
Skin tenderness	12	23.08	24	46.15	12	23.08	4	7.69
Heel pain	43	82.71	4	7.69	3	5.76	2	3.84
Calf pain	29	55.76	9	17.30	8	15.39	6	11.55
Knee tenderness	45	86.56	3	5.76	2	3.84	2	3.84
Pelvic/pubuc pain/ache	4	7.69	28	53.85	16	30.77	4	7.69
Cramp at legs	12	23.08	24	46.15	12	23.08	4	7.69
Earache	40	76.92	8	15.39	4	7.69	0	0.00
Headeache	4	7.6	12	23.0	24	46.15	12	23.0

Table 5. (continued) Distribution of bed rest associated physical symptoms experienced by pregnant women.

Physical Symptoms	Absent		Mild		Moderate		Severe	
	n	%	n	%	n	%	n	%
Sight problems	37	71.15	0	0.00	9	17.30	6	11.55
Difficulty in sleeping	14	26.92	12	23.08	13	25.00	13	25.00
Waking up to go to bathroom	11	21.16	15	28.84	14	26.92	12	23.08
Waking up at night	25	48.09	13	25.00	5	9.61	9	17.30
Sleeplessness after waking up	13	25.00	12	23.08	20	38.46	7	13.46
Unrefreshed waking up	16	30.78	16	30.76	9	17.30	11	21.16
Involuntary drowsiness at daytime	9	17.30	29	55.76	8	15.39	6	11.55
Shortness of breath due to exercise/extreme activities	15	28.84	17	32.70	10	19.23	10	19.23
Dizziness	19	36.55	31	59.61	2	3.84	0	0.00
Faintness	33	63.45	0	0.00	19	36.55	0	0.00
Exhaustion	12	23.08	22	42.30	11	21.16	7	13.46
Constipation	23	44.23	18	34.61	6	11.55	5	9.61
Stuffiness	24	46.15	27	51.92	1	1.93	0	0.00
Edema	25	48.09	13	25.00	5	9.61	9	17.30
Hemorrhoid	26	50.00	11	21.16	12	23.08	3	5.76

Table 6. Distribution of stress scores for pregnant women at bed rest.

Antepartum Hospital Stressors Inventory	n*	X	±SD
Seperation	52	2.43	0.97
6. Sleeping alone	52	2.30	1.11
7. Being away from my job	4	2.00	0.00
10. Being away from home	52	2.53	0.13
19. Being away from my husband	52	2.76	0.88
22. Being away from habitual works	52	1.92	0.43
32. Being away from my friends	52	2.23	0.98
47. Being away from my family	52	3.27	1.25
Environment	52	2.19	0.95
16. Sleeping in an unknown bed	52	2.48	0.64
20. Lack of privacy	52	2.92	1.01
25. Boredom of being idle	52	2.56	0.78
26. Eating hospital meals	52	1.92	0.20
28. Hearing pulses from the monitor	52	1.61	0.15
35. Noise disturbance of hospital staff	52	2.97	1.09
38. Dependence on hospital staff for room cleaning	52	1.53	0.44
39. Noise disturbance in the hospital	52	2.38	0.95
40. Sharing the room with other patients	52	1.38	0.44
Health Status	52	2.72	0.66
3. Medication	52	2.88	0.79
4. Anxious about my own health	52	2.23	0.47
9. Tests	52	2.38	1.03
14. Anxious about my baby's well-being	52	3.61	1.26
27. Concerns about duration of hospitalization	52	3.30	1.17
36. Concerns about the well-being of other patients	52	2.15	0.54
44. Concerns about test results	52	2.44	0.48
48. Being tired of staying in bed	52	2.79	0.88
Communication with Health Providers	52	2.08	0.69
5. Trying to understand the explanations of test results	52	1.84	0.56
12. Trying to understand the medical terminology	52	2.39	0.89
13. Too much information about my status	52	1.84	0.34
33. Lack of information about my status	52	3.18	1.63
41. Hasty attitudes of nursing staff	52	1.69	0.87
45. Talking about myself to health professionals whom I don't know	52	1.0	0.5
49. Diverse and varying opinions of health professionals	37	2.55	0.74

Table 6. (continued) Distribution of stress scores for pregnant women at bed rest.

Antepartum Hospital Stressors Inventory	n*	X	±SD
Self-image	52	1.97	0.69
1. Being less active than usual	52	2.46	0.38
2. Not being at home to make arrangements for the baby	52	1.61	0.45
8. Concerns about being a mother	52	1.78	0.76
11. Questioning by other patients and visitors	52	1.46	0.49
17. Dependency on others	52	1.79	0.62
31. Wearing pyjamas/nightgown all the time	52	1.57	0.67
42. Concerns about labor	52	3.16	1.34
Emotional Status	52	2.54	0.92
15. Feeling sad	52	3.06	1.06
21. Fearfull	52	2.81	0.77
24. Distressful	52	3.03	1.30
30. Angry	52	1.23	0.61
46. Lonely	52	2.61	0.76
Family Status	52	1.97	0.33
18. Thinking of my partner who overtook my responsibilities	52	2.07	0.82
23. Concerns about the care of children at home	15	3.25	1.16
34. Concerns about the hospital charges	52	0.61	0.11

* n, "Bana uygun değil" seçeneğini cevaplayan kişiler çıkartılarak hesaplanmıştır.

Table 7. Correlation between the age and obstetric characteristics of pregnant women and the psychological symptoms experienced.

Features of Pregnants	Psychological Symptoms													
	Difficulty in concentrating		Attitude change		Tension-Nervousness		Boredom		Sensorial changes		Nightmares		Being more emotional	
Age	r=.37	p<0.05	r=.18	p>0.05	r=.43	p<0.05	r=.08	p>0.05	r=.15	p>0.05	r=.03	p>0.05	r=.17	p>0.05
Planned Pregnancies	r=.09	p>0.05	r=.22	p>0.05	r=.51	p<0.05	r=.11	p>0.05	r=.26	p>0.05	r=.73	p<0.001	r=.80	p<0.0001
Unintended Pregnancy	r=.07	p>0.05	r=.02	p>0.05	r=.10	p>0.05	r=.09	p>0.05	r=.08	p>0.05	r=.03	p>0.05	r=.13	p>0.05
Parity	r=.34	p<0.05	r=.24	p>0.05	r=.21	p>0.05	r=.26	p>0.05	r=.07	p>0.05	r=.06	p>0.05	r=.22	p>0.05
Miscarriage/Curretage Status	r=.00	p>0.05	r=.03	p>0.05	r=.06	p>0.05	r=.01	p>0.05	r=.00	p>0.05	r=.09	p>0.05	r=.19	p>0.05
Number of Living Children	r=.24	p>0.05	r=.21	p>0.05	r=.39	p<0.05	r=.19	p>0.05	r=.13	p>0.05	r=.11	p>0.05	r=.52	p<0.05

Table 8. Correlation between the mean stress scores of pregnant women and the psychological symptoms experienced.

Anteparum Hospital Stressors Inventory	Psychological Symptoms													
	Difficulty in concentrating		Attitude change		Tension-Nervousness		Boredom		Sensorial changes		Nightmares		Being more emotional	
Separation	r=.26	p>0.05	r=.19	p>0.05	r=.66	p<0.01	r=.28	p>0.05	r=.12	p>0.05	r=.28	p>0.05	r=.75	p<0.001
Environment	r=.24	p>0.05	r=.23	p>0.05	r=.18	p>0.05	r=.19	p>0.05	r=.39	p<0.05	r=.37	p<0.05	r=.27	p>0.05
Health Status	r=.28	p>0.05	r=.27	p>0.05	r=.73	p<0.001	r=.23	p>0.05	r=.21	p>0.05	r=.27	p>0.05	r=.26	p>0.05
Communication with Health Providers	r=.18	p>0.05	r=.22	p>0.05	r=.25	p>0.05	r=.41	p<0.05	r=.14	p>0.05	r=.17	p>0.05	r=.16	p>0.05
Self-image	r=.11	p>0.05	r=.13	p>0.05	r=.15	p>0.05	r=.44	p<0.05	r=.12	p>0.05	r=.13	p>0.05	r=.27	p>0.05
Emotional Status	r=.21	p>0.05	r=.53	p<0.05	r=.22	p>0.05	r=.20	p>0.05	r=.23	p>0.05	r=.21	p>0.05	r=.68	p<0.01
Family Status	r=.23	p>0.05	r=.21	p>0.05	r=.64	p<0.01	r=.24	p>0.05	r=.16	p>0.05	r=.22	p>0.05	r=.28	p>0.05

Table 9. Correlation between the physical and psychological symptoms of pregnant women.

Physical Symptoms	Psychological Symptoms													
	Difficulty in concentrating		Attitude change		Tension-Nervousness		Boredom		Sensorial changes		Nightmares		Being more emotional	
Indigestion	r=.02	p>0.05	r=.14	p>0.05	r=.19	p>0.05	r=.13	p>0.05	r=.00	p>0.05	r=.00	p>0.05	r=.00	p>0.05
Reflux	r=.13	p>0.05	r=.16	p>0.05	r=.43	p<0.05	r=.55	p<0.05	r=.02	p>0.05	r=.00	p>0.05	r=.19	p>0.05
Nausea	r=.74	p<0.001	r=.11	p>0.05	r=.27	p>0.05	r=.26	p>0.05	r=.06	p>0.05	r=.11	p>0.05	r=.18	p>0.05
Loss of appetite	r=.15	p>0.05	r=.24	p>0.05	r=.28	p>0.05	r=.27	p>0.05	r=.03	p>0.05	r=.09	p>0.05	r=.21	p>0.05
Pubic pain	r=.19	p>0.05	r=.15	p>0.05	r=.65	p<0.01	r=.22	p>0.05	r=.01	p>0.05	r=.18	p>0.05	r=.41	p<0.05
Other abdominal problems	r=.06	p>0.05	r=.03	p>0.05	r=.17	p>0.05	r=.11	p>0.05	r=.00	p>0.05	r=.00	p>0.05	r=.00	p>0.05
Hip pain	r=.00	p>0.05	r=.00	p>0.05	r=.14	p>0.05	r=.13	p>0.05	r=.00	p>0.05	r=.00	p>0.05	r=.00	p>0.05
Back pain	r=.03	p>0.05	r=.00	p>0.05	r=.19	p>0.05	r=.14	p>0.05	r=.00	p>0.05	r=.00	p>0.05	r=.00	p>0.05
Leg pain	r=.00	p>0.05	r=.00	p>0.05	r=.16	p>0.05	r=.13	p>0.05	r=.00	p>0.05	r=.00	p>0.05	r=.00	p>0.05
Pain in the external ear	r=.21	p>0.05	r=.17	p>0.05	r=.12	p>0.05	r=.19	p>0.05	r=.05	p>0.05	r=.00	p>0.05	r=.00	p>0.05
Low back pain	r=.00	p>0.05	r=.01	p>0.05	r=.16	p>0.05	r=.21	p>0.05	r=.00	p>0.05	r=.00	p>0.05	r=.00	p>0.05
Rash/erythema	r=.00	p>0.05	r=.00	p>0.05	r=.03	p>0.05	r=.12	p>0.05	r=.00	p>0.05	r=.00	p>0.05	r=.00	p>0.05
Dry skin	r=.00	p>0.05	r=.00	p>0.05	r=.20	p>0.05	r=.11	p>0.05	r=.00	p>0.05	r=.00	p>0.05	r=.00	p>0.05
Dry lip	r=.00	p>0.05	r=.00	p>0.05	r=.15	p>0.05	r=.08	p>0.05	r=.00	p>0.05	r=.00	p>0.05	r=.00	p>0.05
Skin tenderness	r=.00	p>0.05	r=.03	p>0.05	r=.10	p>0.05	r=.15	p>0.05	r=.00	p>0.05	r=.00	p>0.05	r=.00	p>0.05
Heel pain	r=.00	p>0.05	r=.00	p>0.05	r=.04	p>0.05	r=.09	p>0.05	r=.00	p>0.05	r=.00	p>0.05	r=.00	p>0.05
Calf pain	r=.00	p>0.05	r=.00	p>0.05	r=.06	p>0.05	r=.11	p>0.05	r=.00	p>0.05	r=.00	p>0.05	r=.00	p>0.05
Knee tenderness	r=.00	p>0.05	r=.00	p>0.05	r=.03	p>0.05	r=.10	p>0.05	r=.00	p>0.05	r=.00	p>0.05	r=.00	p>0.05
Pelvic/pubuc pain/ache	r=.22	p>0.05	r=.16	p>0.05	r=.23	p>0.05	r=.17	p>0.05	r=.01	p>0.05	r=.17	p>0.05	r=.39	p<0.05
Cramp at legs	r=.01	p>0.05	r=.07	p>0.05	r=.08	p>0.05	r=.06	p>0.05	r=.00	p>0.05	r=.00	p>0.05	r=.00	p>0.05
Earache	r=.48	p<0.05	r=.22	p>0.05	r=.18	p>0.05	r=.17	p>0.05	r=.03	p>0.05	r=.09	p>0.05	r=.16	p>0.05
Headache	r=.55	p<0.05	r=.27	p>0.05	r=.28	p>0.05	r=.26	p>0.05	r=.02	p>0.05	r=.23	p>0.05	r=.20	p>0.05
Sight problems	r=.46	p<0.05	r=.28	p>0.05	r=.21	p>0.05	r=.27	p>0.05	r=.07	p>0.05	r=.16	p>0.05	r=.19	p>0.05
Difficulty in sleeping	r=.11	p>0.05	r=.18	p>0.05	r=.23	p>0.05	r=.25	p>0.05	r=.00	p>0.05	r=.10	p>0.05	r=.12	p>0.05
Waking up to go to bathroom	r=.07	p>0.05	r=.04	p>0.05	r=.09	p>0.05	r=.10	p>0.05	r=.00	p>0.05	r=.02	p>0.05	r=.00	p>0.05
Waking up at night	r=.18	p>0.05	r=.19	p>0.05	r=.20	p>0.05	r=.20	p>0.05	r=.00	p>0.05	r=.11	p>0.05	r=.03	p>0.05
Sleeplessness after waking up	r=.22	p>0.05	r=.36	p<0.05	r=.24	p>0.05	r=.26	p>0.05	r=.00	p>0.05	r=.38	p<0.05	r=.02	p>0.05
Unrefreshed waking up	r=.38	p<0.05	r=.26	p>0.05	r=.24	p>0.05	r=.48	p<0.05	r=.02	p>0.05	r=.13	p>0.05	r=.06	p>0.05
Involuntary drowsiness at daytime	r=.16	p>0.05	r=.20	p>0.05	r=.53	p<0.05	r=.24	p>0.05	r=.01	p>0.05	r=.08	p>0.05	r=.09	p>0.05
Shortness of breath due to exercise/extreme activities	r=.09	p>0.05	r=.04	p>0.05	r=.11	p>0.05	r=.13	p>0.05	r=.00	p>0.05	r=.00	p>0.05	r=.13	p>0.05
Dizziness	r=.39	p<0.05	r=.26	p>0.05	r=.19	p>0.05	r=.52	p<0.05	r=.03	p>0.05	r=.20	p>0.05	r=.22	p>0.05
Faintness	r=.03	p>0.05	r=.09	p>0.05	r=.17	p>0.05	r=.13	p>0.05	r=.05	p>0.05	r=.12	p>0.05	r=.24	p>0.05
Exhaustion	r=.35	p<0.05	r=.27	p>0.05	r=.21	p>0.05	r=.20	p>0.05	r=.35	p<0.05	r=.19	p>0.05	r=.16	p>0.05
Constipation	r=.11	p>0.05	r=.06	p>0.05	r=.20	p>0.05	r=.19	p>0.05	r=.00	p>0.05	r=.00	p>0.05	r=.00	p>0.05
Stiffness	r=.10	p>0.05	r=.02	p>0.05	r=.32	p<0.05	r=.12	p>0.05	r=.07	p>0.05	r=.00	p>0.05	r=.03	p>0.05
Edema	r=.12	p>0.05	r=.10	p>0.05	r=.24	p>0.05	r=.21	p>0.05	r=.04	p>0.05	r=.11	p>0.05	r=.18	p>0.05
Haemorrhoid	r=.02	p>0.05	r=.08	p>0.05	r=.22	p>0.05	r=.18	p>0.05	r=.00	p>0.05	r=.00	p>0.05	r=.00	p>0.05

Discussion

Major part of our demographic data is parallel to the demographic data of the study carried out by Oskay1 on 60 pregnant women at partial and complete bed rest. According to our data, the pregnant women were mostly supported by their partners (80.76%) and parents (65.38%) during the hospitalization period. Similarly, in the study by Oskay 1 most of the support was provided by partners (91.7%), close relatives (61.7%) and parents (55.0%). The results of an interview carried out by Gupton, Heaman and Aschroft 11 'with 24 high-risk pregnant women at bed rest showed that parents and friends are most common support providers. In a study by Maloni, Brezinski-Tomasi and Johnson12 on 89 high-risk hospitalized pregnant women, the pregnant women and their partners were evaluated together, and it was found out that most common sources of support were par-

ents and close relatives. In a study carried out by Schroeder15 on 12 high-risk pregnant women, it was also shown that pregnant women are mostly supported by their parents and close relatives during the hospitalization period. Our data is also in compliance with the literature.

Our participants mostly communicated with their roommates during the hospitalization period (86.53%). It was also reported by Oskay 1 that pregnant women communicated with their roommates at most (83.3%). Our participants spent most of their leisure time by chatting (92.3%); rate for reading was very low (15.38%). It is also the case in the Oskay1 study that pregnant women spent most of their time by chatting (85%), but rate for reading was pretty high (75.0%). Lower reading rates in our study may result from the fact that majority of our participants were graduated from elementary school.

Of all pregnant women participated in our study, 53.84% indicated that they would have preferred to take bed rest at home whereas in the Oskay study¹, 53.3% of pregnant women expressed that they would prefer to stay at hospital for bed rest. In our study, the pregnant women, who indicated that they would have preferred to take bed rest at home, explained that they would prefer it in order to be able take care of their children, take a bath and not to feel bored and irritated.

Presence and severity of bed-rest-associated physical (reflux, pelvi/back/leg pain, dry lip, skin tenderness, headache, stuffiness, sleep disorders, etc.) and psychological (attitude change, tension-nervousness, boredom, etc.) symptoms in the pregnant women participated in our study are parallel with the study carried out by Oskay and Şahin³. Nine out of 10 high-risk pregnant women participated in this study indicated that they mostly experienced "boredom" among psychological symptoms, and eight out of 10 pregnant women indicated that they mostly experienced "sleep disorder" among all physical symptoms. McGain and Deatrick¹⁰ studying the hospitalization-associated-psychological problems experienced by 21 high-risk pregnant women showed that the pregnant women remarkably experienced "anxiety", "attitude change" and "boredom". Psychological problems identified by Gupton, Heaman and Aschroft¹¹ in risky pregnancies are as follows: Boredom, sense of loss of control and being a prisoner, uncertainty, being tired of waiting and concerns regarding fetus's well being. In Schroeder's¹⁵ study, it was reported that pregnant women who were at bed rest in the hospital underwent serious physical and psychological changes. The results of our study are supportive to the literature in that respect.

The most common stressors for the high-risk pregnant women participated in our study were "anxious about my baby's well-being", "concerns about hospitalization period", "Being away from my family", "Concerns about the care of children at home", "Lack of information about my status", "Concern about labor" and "Feeling sad". Findings of "Being away from my family", "Lack of information about my status" and "Feeling sad" were similar to the study carried out by Oskay.¹ The hospital stressors identified by Gupton, Heaman and Aschroft¹¹ in high-risk pregnant women were "Feeling irritated", "Anxious about my baby's well-being", "Concerns about care of children at home"

and "Being away from my family". The results of a study by Heaman and Gupton¹³ on 24 hospitalized risk pregnancies have shown that the most important stressors were "Being away from by family", "Lack of privacy" and "Uncomfortable hospital conditions". The major stressor identified by Martin-Arafeh et al.¹⁴ and Maloni¹⁶ is also "Being away from my family". Our results are in parallel to the literature.

Depending on our data, as age advanced, difficulty in concentrating and tension-nervousness increased in the pregnant women at bed rest ($p < 0.05$). There was a significant relation between planned pregnancies and tension-nervousness ($p < 0.05$). Again, a significant relation was found between planned pregnancies and nightmares ($p < 0.01$) and being more emotional ($p < 0.0001$). As parity increased, concentration problems increased ($p < 0.05$). As number of living children increased, tension-nervousness and being more emotional became more intense ($p < 0.05$). Those results were supported by the fact that pregnant women with one or more children preferred to take bed rest at home rather than at hospital. Pregnant women with children are concerned about their children at home as well as the risks of their current pregnancy and they experience psychological problems.

We have found a significant relation between the stressors and the psychological symptoms the pregnant women experienced. The most strong relationships were found between the stress caused by leaving home and being more emotional ($p < 0.001$), and stress caused by health status and tension-nervousness ($p < 0.001$). Emergence of psychological problems due to being away from home and fetus's health being under threat during pregnancy is a comprehensible situation.

From physical symptoms experienced by pregnant women, nausea was very significantly related with concentration problem ($p < 0.001$). Pelvic pain and tension-nervousness were significantly related ($p < 0.01$). Such physical and psychological problems are considered to be associated with pregnant woman's fear of fetus loss. We have found that psychological problems experienced by high-risk pregnant women participated in our study were related with age, obstetric characteristics and physical problems experienced. Pregnant women experience some physical and psychological problems due to the bed rest at hospital, and physical problems are significantly related with psychological problems. Age and obstetric histories of the

pregnant women have an impact on the structure and level of the psychological problems. Studies have shown that efficient nursing care significantly reduced the physical problems of high-risk pregnant women at bed rest. Oskay¹ emphasized that professional support is required to eliminate the psychological problems. However, our data showed that there was a significant relation between physical problems and psychological problems, which amplifies the significance of nursing care that would be given for elimination of physical problems.

Conclusion

In our study aiming to identify the bed rest associated physical and psychological problems of the high-risk pregnant women at partial bed rest, it has been found out that physical symptoms of the pregnant women were at mild and moderate levels, and they mostly experienced reflux, pelvic/back/leg pains, headache, dry lip and sleep disorders. Psychological problems were usually at moderate levels, and they mostly experienced boredom, tension-nervousness, nightmares and being more emotional. The most common stressors of pregnancy were "Anxious about my baby's well-being", "Concerns about hospitalization period" and "Being away from my family". It was also shown that psychological symptoms are related with age, obstetric characteristics and physical symptoms.

All nurses working at perinatology services should be informed about the bed rest associated physical and psychological problems that we identified and they should be alarmed about the precursor indications. It is very important to support their knowledge about risky pregnancies and side effects of the bed rest by continuous training programmes. Evidence-based information and practices are changing and developing day by day. Nursing approaches including various options are needed.

Monitoring high-risk pregnant women at home is vital in achieving healthy pregnancy outcomes as major part of bed rests is also held at home. Efficiency of perinatology nurses at home-care functions, and giving training and consultation to the pregnant women would be of great help. Based on this, preparation of monitoring procedures about pregnancy home care, instructing the pregnant and her family, organizing programmes

addressing the patient follow-up methods by phone, and early planning and application of measures to be taken have become essential for executing a contemporary nursing care to provide the pregnant women, who takes bed rest at home, with a safe delivery and a healthy neonate.

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Retrospective Analysis of 660 Stillbirth Cases During Ten Years Period

Ahmet Kale¹, Nurten Akdeniz¹, Mahmut Erdemođlu¹, Ahmet Yalınkaya¹, Murat Yayla²

¹Department of Gynecology and Obstetrics, Faculty of Medicine, Dicle University, Diyarbakır

²Clinics of Gynecology and Obstetrics, Haseki Training and Research Hospital, Istanbul

Abstract

Objective: The aim of this study was to analyze 660 stillbirth cases retrospectively during 10 years period.

Methods: We evaluated 660 stillbirth cases (group1) retrospectively during 10 years period in our clinic. Maternal age, parity, prepartum estimated gestational week, birth weight, vaginal and abdominal delivery ratio, cesarean section indications, fetal anomalies, maternal diseases were evaluated and compared with 660 women (group2) who had given live births .

Results: The ratio of stillbirth was 4.91% during ten years period. Multiparity was 73.63% in cases. Prepartum estimated mean gestational week was 33.8 ±3.9 in stillbirths and 25.75% of women had undergone cesarean section. Gestational hypertension 33.78%, gestational diabetes mellitus 1.0%, and type II diabetes mellitus were 0.3% in group 1. Fetal abnormality was found 12.12% in stillbirths. Pregnancy induced hypertension ratio was in group 1 and group 2 33.78%, 13.18% respectively (p<0.001). Cesarean section ratio were 25.75% and 46.21% in group 1 and group 2 respectively (p<0.001). The most seen cesarean indication was abruptio placentae (%12.87) in group 1. Fetal anomaly ratio were 12.12% and 3% in group 1 and group 2 respectively (p<0.001). Mean birth weight were 2121±1200 g and 2828 ±979 in group 1 and in group 2 respectively (p<0.001).

Conclusion: Gestational hypertension, fetal anomalies and placental abruption are the most common causes of fetal demise in our study. Our stillbirth ratio is higher than literature. High delivery rate, inadequacy of pregnant visits, inefficiency of antenatal care centers for high risk pregnant patients can increase ratio in our region. Improvement of antenatal care units in primary and secondary health centers may decrease our stillbirth ratio.

Keywords: Stillbirth, gestational hypertension, fetal anomaly, antenatal care.

On yıllık 660 ölü doğum olgusunun retrospektif analizi

Amaç: Kliniğimizde on yıllık sürede ölü doğum yapan 660 olguyu retrospektif olarak değerlendirmek.

Yöntem: Kliniğimizde 10 yıllık sürede gerçekleşen 660 ölü doğum olgusu (grup 1) retrospektif olarak incelendi. Olgular anne yaşı, paritesi, prepartum tahmini gebelik haftası, yenidoğan ağırlığı, normal vajinal ve abdominal doğum oranı, sezaryen endikasyonları, fetal anomaliler, maternal hastalıklar yönünden değerlendirildi ve olgular canlı doğum yapan random olarak seçilen 660 gebe (grup 2, kontrol grubu) ile karşılaştırıldı.

Sonuçlar: On yıllık sürede ölü doğum oranı %4.91 bulundu. Olguların %73.63'ü multipar, prepartum tahmini gebelik haftası 33.8±3.9 olarak bulundu ve %25.75'inin sezaryen ile doğum yaptığı belirlendi. Gebelikte görülen tüm hipertansif hastalıklar %33.78, gestasyonel diabetes mellitus %1.0 ve tip 2 diabetes mellitus %0.3 oranında bulundu. Ölü doğan fetusların %12.12'sinde fetal malformasyon saptandı. Gebeliğin indüklediği hipertansiyon grup 1 olgularında %33.78, grup 2'de %13.1 olarak bulundu (p<0.001). Sezaryen oranı grup 1'de %25.7, grup 2'de %46.21 olarak bulundu (p<0.001). Grup 1 olgularının %25.75'inin doğumunun sezaryen ile gerçekleştiği ve en sık sezaryen endikasyonunun dekolman plasenta (%12.87) olduğu saptandı. Ortalama yenidoğan ağırlığı grup 1'de 2121±1200g, grup 2'de 2828 ±979g olarak belirlendi (p<0.001).

Tartışma: Çalışmamızda sık görülen ölü doğum nedenleri gebelikte görülen hipertansif hastalıklar, fetal anomaliler ve dekolman plasenta olarak saptanmıştır. Ölü doğum oranımız literatürden yüksek bulundu. Bölgemizde doğum oranımızın ve gebelik

süresince düzenli takip altında olmayan gebelerin yüksekliği ve yüksek riskli olarak saptanan gebeliklere hizmet verecek merkezlerin yetersizliği ya da mevcut merkezlerin eksik tedavisi oranımızın yüksekliğini açıklamaktadır.

Sonuç: Birincil ve ikincil merkezlerde antenatal bakım hizmetlerinin artırılması ölü doğum oranını azaltabilir.

Anahtar Sözcükler: Ölü doğum, gestasyonel hipertansiyon, fetal anomali, antenatal bakım.

Introduction

Delivery after 20 weeks' gestation in which the infant displays no sign of life during perinatal or postnatal period or weighs than 500 grams is called stillbirth. In recent years, rate of stillbirths has shown a decline from 11.5/1000 to 5.1/1000 in parallel to the developments in the obstetric, clinic, genetic and maternal-fetal medicine. The most common known four causes of stillbirths are infection, malformation, intrauterine growth retardation and abruptio placentae. Also, causes with unknown etiology have a significant portion.¹

The objective of our study was to retrospectively evaluate the cases who were referred to our clinic due to in utero mort fetus and those who were diagnosed with in utero mort fetus and delivered in our clinic in aspects of maternal age, parity, birthweight, vaginal and abdominal delivery ratios, indications for caesarean section, fetal anomalies and maternal diseases.

Methods

Doğum Out of 13,431 deliveries realized in the Obstetrics Clinic between June 1, 1994 and June 1, 2004 for a period of 10 years, 660 stillbirths were retrospectively evaluated. All data about the cases were obtained from computer records, registration books and patient files. Those cases of 660 stillbirths were considered Group 1 while randomized 660 cases with livebirths in our clinic comprised the Group 2. We evaluated the maternal age, parity, birthweight, delivery method, indications for caesarean section, fetal anomalies and maternal diseases for both groups. Records showed that the gestational age and absence of any fetal cardiac activity were determined by obstetric ultrasonography for all cases. Fetal anomalies had been detected by prenatal ultrasonography and findings of postpartum physical examination on the fetus.

Statistical analysis of the data was made by SPSS (Statistical Package for Social Science) version 10.0. For analysis, Chi-square and Student-t test were used, and $p < 0.05$ was considered statistically significant.

Results

A total of 13,431 deliveries had been realized in our clinic within a period of 10 years, and 660 of these deliveries were (4.91%) stillbirths. The mean maternal age was 30.5 ± 7.2 years in Group 1 and 29.9 ± 5.6 years in Group 2 ($p > 0.05$). The mean prepartum estimated gestational week was 33.8 ± 3.9 in Group 1 and 34.9 ± 3.2 in Group 2 ($p > 0.05$). All pregnancy-related hypertensive disorders were found in 33.78% of Group 1 cases (26% preeclampsia, 6% chronic hypertension, 1.8% eclampsia), and in 13.18% of Group 2 cases (12.18% preeclampsia, 1% eclampsia) ($p < 0.001$). In Group 1, 1.0% gestational diabetes mellitus (diagnosed by 100 gr Oral Glucose test) and 0.3% Type 2 diabetes mellitus were found while a maternal mortality due to intraabdominal hemorrhage secondary to uterus rupture was observed (Table 1). 25.75% of the deliveries in Group 1 was caesarean section, and the most frequent indication for caesarean section was abruptio placentae (12.87%) whereas in Group 2, the ratio of caesarean section was 46.21% and the most frequent indication for caesarean section was a previous caesarean section. Indications for caesarean section in the Group 1 cases are shown at Table 2. Also, three of cases (0.45%) in the Group 1 underwent cesarian hysterectomy due to uterus rupture (Porro operation).

The mean birthweight was 2121 ± 1201 g in Group 1, and 80 cases (12.12%) had fetal malformation. Among malformations, the most frequent ones were cerebrospinal anomalies (68.7%) and immune hydrops fetalis (10%); the diagnosis for

Table 1. Demographic characteristics, gestational hypertension ratio, delivery methods ratio, mean birthweights and fetal anomalies of the cases in Group 1 and Group 2.

Maternal and fetal characteristics	Group 1 (Mean \pm SD)	Group 2 (Mean \pm SD)	p
Maternal age	30.5 \pm 7.2	29.9 \pm 5.6	>0.05
Gravida	4.2 \pm 2.3	3.3 \pm 1.1	>0.05
Parity	3.2 \pm 1.2	2.4 \pm 1.1	>0.05
Gestational week	33.8 \pm 3.9	34.9 \pm 3.2	>0.05
All hypertensive conditions experienced in pregnancy	223 (%33.78)	87 (%13.18)	<0.001
Delivery by caesarean section	170 (%25.75)	305 (%46.21)	<0.001
Mean birthweight (g)	2121 \pm 1200	2828 \pm 979	<0.001
Fetal anomalies	80 (%12.12)	20 (%3.03)	<0.001

Table 2. Distribution of indications for cesarean section in Group 1

Indications	n	%
Apruptio placenta	85	50
Previous caesarean section	30	17.6
Macrosomic infant	10	5.8
Arm prolapse	9	5.2
Cephalopelvic disproportion	9	5.2
Placenta previa totalis	7	4.1
Uterus rupture	6	3.5
Nonprogressive labor	4	2.3
Transverse position	3	1.7
HELLP syndrome	2	1.1
Development of primigravid anus	2	1

Table 3. Distribution of fetal anomalies detected in Group 1

Distribution of fetal anomalies	n	%
Anencephaly	23	28.7
Hydrocephaly	12	15.0
Immune hydrops fetalis	8	10.0
Meningomyelocele	7	8.7
Encephalocele	5	6.2
Skeletal displasia	5	6.2
Anencephaly + spina bifida	4	5.0
Gastroschisis	3	3.7
Holoprocencephaly	3	3.7
Omphalocele	2	2.5
Cystic hygroma	2	2.5
Sacroccygeal Teratoma	2	2.5
Encephalocelel+spina bifida	2	2.5
Vertebral colon aplasia	1	1.2
Down syndrome	1	1.2

immune hydrops fetalis was made by indirect coombs test positivity and obstetric ultrasonography (Table 3). In Group 2, the mean birthweight was 2828 \pm 979 g ($p<0.001$), and 20 cases (3.03%) had fetal malformation ($p<0.001$). Among malformations, the most common ones were cerebrospinal anomalies (77%) and hydrops fetalis (8%). Rate of fetal anomaly was 3.0% in Group 2 (12 anencephaly, 4 immune hydrops fetalis, 4 meningomyelocele) ($p<0.001$). All fetal malformations detected were resolved in our clinic.

Discussion

Stillbirth means delivery after 20 weeks' gestation in which the infant displays no sign of life during perinatal or postnatal period or weighs less than 500 grams. They can occur due to fetal, placental or maternal causes.¹ Although stillbirths are mainly observed during early gestational weeks, 80% of such deaths occur before term.² We have found that the mean gestational week of stillbirths was 33.8 \pm 3.9.

Fetal anomalies are one of the causes of death. Gürel et al. found a ratio of 9.8% for fetal anomalies per,³ 800 stillbirths. The rate of fetal anomaly was 12.12% in our study. It was significantly higher than the fetal anomaly rate in the control group. Neural tube defect (NTD), hydrops fetalis, isolated hydrocephaly are the most common fetal anomalies leading to stillbirth. Of NTD cases, anencephalic fetuses are either born dead or die right after the delivery.^{4,5} In our study group, among fetal anomalies, cerebrospinal anomaly was at the first place with 68.7%, which was followed by hydrops fetalis with 10%. Anencephaly was the most frequent type of cerebrospinal anomaly (28.7%).

Abruptio placentae was the most common anomaly among placental causes leading to stillbirth. In a study carried out on 278 stillbirths, Fretts et al.⁶ found the rate of stillbirth associated with abruptio placentae as 14%. Again in a study carried out with 40,000 pregnant women in the Parkland hospital, it was found out that 12% of stillbirths were associated with abruptio placentae.¹ In parallel to the literature, we have found a rate of 12.87% for abruptio placentae. Önderoğlu et al.⁷ revealed that 326 out of 513 pregnant women

who had a stillbirth were multiparous, and the most common cause of death (32,5%) was maternal hypertension. However, Gürel et al.³ reported that 29.5% of stillbirths were resulting from preeclampsia and eclampsia. In our study, 73.63% of mothers with stillbirth delivery was multiparous, and stillbirth was related with gestational hypertension in 33.78% of cases ($p < 0.001$). Ahlenius et al.⁸ found microfarcts in their placental analysis of stillbirths related with pregnancy-induced hypertension.⁸ Pregnant women with carbohydrate intolerance have an increased risk of stillbirth.⁹ The incidence of intrauterine exitus associated with pregnancy and diabetes had been reduced from 12% down to 0.4%.¹⁰ In our series, the ratio of stillbirth associated with gestational diabetes mellitus and pregestastional diabetes mellitus was 1.3%.

In conclusion, we have found that the most frequent three causes of stillbirths were gestational hypertension, fetal anomalies and abruptio placentae. Our birthstill rate with 49.14 per thousand, alone, is higher than the perinatal mortality rate in our population, which mainly results from the fact that we are a reference center. Also, insufficient antenatal care service provided by the primary and secondary centers in our region may be one of the reasons raising our rate. Improved antenatal care services in the primary and secondary centers, detection of high-risk pregnancies in earlier gesta-

tional weeks and taking the necessary medical precautions may contribute to decreases in the birthstill rate.

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Does Previous Cesarean Delivery Increase the Risk of Ectopic Pregnancy?

Levent Tütüncü, Ercüment Müngen, Murat Muhcu, Murat Sancaktar, Yusuf Ziya Yergök

¹Clinics of Gynecology and Obstetrics, GATA Haydarpaşa Training Hospital, Istanbul

Abstract

Background and Objective: Ectopic pregnancy is the leading cause of pregnancy-related death with an overall incidence of 1-2% and its incidence is increasing. Similarly, cesarean delivery rates are rising and currently rates are close to 25%. It is accepted that history of pelvic surgery is a risk factor for ectopic pregnancy but it is controversial whether previous cesarean delivery is an independent risk factor for ectopic pregnancy. This study is conducted to determine whether previous cesarean delivery increases the risk of ectopic pregnancy.

Methods: In this retrospective, controlled study, we compared ectopic pregnancy cases with those women who gave birth or ultrasonographically confirmed intrauterine pregnancy had been terminated in our department. Women who had a history of abdominal surgery, infertility, pelvic inflammatory disease, and ectopic pregnancy or intrauterine device users were excluded from the study and only multiparas women included to the study.

Results: During the study period, 343 cases who had a surgically confirmed ectopic pregnancy and 11176 women who had an intrauterine pregnancy were analyzed retrospectively and 101 ectopic pregnancy cases were compared with 5017 women with intra-uterine pregnancy who met the inclusion criteria for the study. There were no significant differences between the groups with respect to demographic characteristics ($p>0.05$). The odds ratio was 1.22 (95%CI:0.79-1.88) ($p=0.352$).

Conclusion: Although the odds ratio was statistically insignificant in this study, previous cesarean section can be a risk factor for ectopic pregnancy. Further studies are necessary to elucidate the effect of previous cesarean delivery on the risk of ectopic pregnancy.

Keywords: Ectopic pregnancy, Cesarean delivery, complication, risk factors.

Geçirilmiş sezaryen doğum ektopik gebelik riskini arttırır mı?

Amaç: Ektopik gebelik %1-2 oranında görülen, gebeliğe bağlı kadın ölümlerinde ön sıralarda yer alan ve son yıllarda insidansında artma olan ciddi bir komplikasyondur. Sezaryen ile doğum da son yıllarda gittikçe artmış, tüm dünyada doğumların yaklaşık %25'i sezaryen ile olmaya başlamıştır. Genel olarak geçirilmiş pelvik cerrahi ektopik gebelik riskini artıran bir faktör olarak kabul edilir, ancak geçirilmiş sezaryen operasyonunun bu riski artırıp artırmadığı net olarak ortaya konulamamıştır. Bu çalışmada önceden geçirilmiş sezaryen operasyonunun ektopik gebelik riskini artırıp artırmadığı ortaya konulmaya çalışılmıştır.

Yöntem: Bu retrospektif, kontrollü çalışmada, Ocak 1993 - Aralık 2003 tarihleri arasında kliniğimizde ektopik gebelik tanısı almış olan olgular, aynı dönemde kliniğimizde doğum yapmış veya intrauterin gebeliği ultrasonografi ile kesinleşmiş ve gebeliği sonlandırılmış, multipar kadınlarla karşılaştırıldı. Daha önceden geçirilmiş batın cerrahisi olanlar, ektopik gebelik, infertilite veya PID hikayesi olanlar, RIA kullanan olgular çalışma dışı bırakıldı ve sadece multipar kadınlar çalışmaya dahil edildi.

Bulgular: Bu dönemde tanısı cerrahi olarak kesinleştirilmiş 343 ektopik gebelik olgusu ve intrauterin gebelik saptanmış 11176 kadın retrospektif olarak tarandı ve çalışmaya dahil edilme kriterlerine uyan 101 ektopik gebelik olgusu, 5017 intrauterin gebelik olgusu ile karşılaştırıldı. Gruplar arasında demografik özellikler açısından anlamlı bir fark saptanmadı ($p>0.05$). Çalışmada gruplar arası olasılık oranı (Odds Ratio) 1.22 (%95 Güven aralığı-Confidence Interval 0.79-1.88) olarak saptandı ($p=0.352$).

Sonuç: Bir pelvik cerrahi girişim olarak sezaryen operasyonu sonraki gebeliklerde ektopik gebelik riskini artıran bir faktör olabilir. Ancak burada sunulan çalışmada, olasılık oranı istatistiksel olarak anlamlı seviyelere ulaşmamıştır. Bu konuda daha büyük çaplı, çok merkezli ve uzun süreli takip çalışmalarına ihtiyaç vardır.

Anahtar Sözcükler: Ektopik gebelik, sezaryen doğum, komplikasyon, risk faktörleri.

Introduction

Ectopic pregnancy has an overall incidence of 1-2% all over the world.^{1,2} It is a very severe complication and it is the leading cause of maternal deaths during the first trimester.³ It has been reported that in recent years, the incidence of ectopic pregnancy has been increasing, particularly in women over 35 years of age.^{3,4} Similarly, there has been a remarkable increase in the incidence of caesarean births within the last 25 years. For example, caesarean rate which was 16.5% in the U.S. in 1980s increased up to 25% at present, which is 20% in England.⁵ Unfortunately, it is not possible to obtain net figures for caesarean rates in our country due to lack of sound statistical data. However, it is already known that there is a remarkable increase, and such an increase has been observed by almost everybody. For example, the caesarean rate in our hospital, which is a training hospital, increased from 11.5% in 1993 to 38.5% in 2003.

Although it has been claimed that increased rate of ectopic pregnancy is particularly associated with increased rates of chlamydial infections or smoking,⁶ increase in caesarean rates may also contribute to this condition.⁷ It is already known that, any type of pelvic surgery, mainly in the adnexial regions, is a risk factor for ectopic pregnancy.⁸ Similarly, it can be concluded that caesarean operation as a surgical intervention can be a risk factor for ectopic pregnancy. The last study published on this subject is dated 1996,⁹ indicating that number of studies is insufficient in the last decade where, in fact, caesarean rates have highly increased.

We retrospectively evaluated the cases followed-up in our clinic in the last decade in order to evaluate whether a previous caesarean operation as a surgical intervention increased the risk for ectopic pregnancy or not.

Methods

We planned a retrospective, controlled study in order to evaluate whether a previous caesarean operation subsequently increased the risk for ectopic pregnancy or not. Based on this, we retrospectively examined 343 women who had a surgically confirmed diagnosis of ectopic pregnancy

between January 1993 and December 2003 in our clinic and 11176 women aged between 18 and 45 years, who had given birth over 500 g or who had ultrasonographically confirmed intrauterine pregnancy, but whose pregnancy was terminated by any reason in spite of healthy pregnancy during the same period. Of examined cases, pregnant women with a history of spontaneous abortus were excluded since it was not confirmed if they previously had any risk factor increasing the ectopic pregnancy or had intrauterine pregnancy. Also only multiparous women were included in the statistical evaluation in order to achieve inter-group similarity. A total of 5017 women, who met the inclusion criteria and were allocated in the control group, was compared with 101 cases of ectopic pregnancy, who comprised the study group and had the same criteria (Figure 1).

Statistical evaluations were carried out by SPSS Ver. 10.0 (Chicago, IL, ABD), using Chi-square and matched t-test, and $p < 0.05$ was considered statistically significant.

Results

Of 101 ectopic pregnancy included in the study, 30 had a previous caesarean delivery (29.7%). The corresponding number in the control group of 5017 cases was 1285 (25.6%). When the groups were compared in terms of age, parity, smoking rate, number of curettage, educational level and oral contraceptive use, no statistically difference was found between the groups ($p > 0.05$) (Table 1). Comparison between the study group

Table 1. General characteristics of the study and control groups.

Characteristic	Study group n=101	Control group n=5017	P values
Mean age (\pm SD)	26.3 \pm 6.2	27.6 \pm 5.9	a.d.
Mean parity (\pm SD)	1.26 \pm 0.3	1.33 \pm 0.4	a.d.
Mean number of curettage (\pm SD)	0.32 \pm 0.14	0.44 \pm 0.18	a.d.
Mean contraceptive use rate	10 (%9.9)	487 (%9.7)	a.d.
Smoking rate	18 (%17.8)	936 (%18.6)	a.d.
Educational level (year \pm SD)	7.3 \pm 1.4	6.8 \pm 1.7	a.d.
Normal delivery or D&C	71 (%70.3)	3732 (%74.4)	a.d.
Caesarean delivery	30 (%29.7)	1285 (%25.6)	a.d.*

SD: Standard deviation, a.d.: not significant ($p > 0.05$), D&C: Dilatation and curettage
* Odds ratio (%95 confidence interval) = 1.22 (0.79-1.88) ($p = 0.352$).

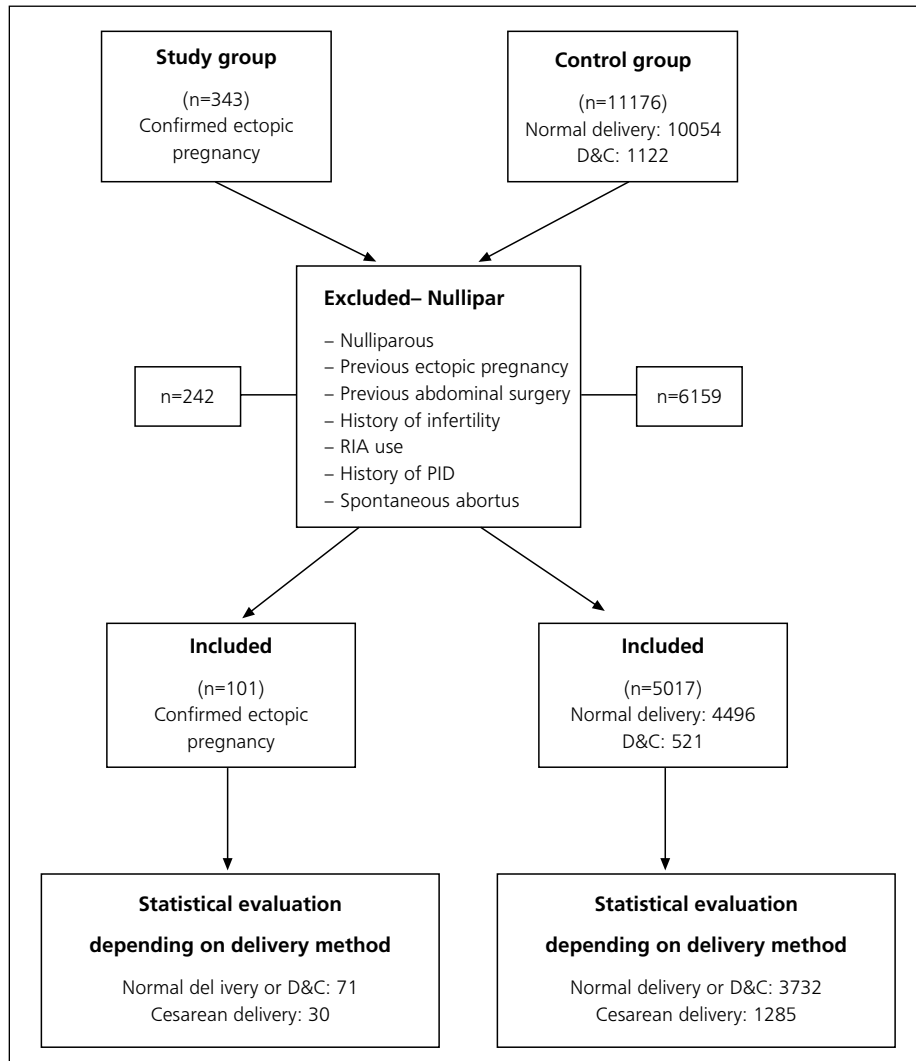


Figure 1. Flowchart (retrospective evaluation of the patients included in the study).

and the control group in terms of caesarean rates gave an odds ratio of 1.22 (95% confidence interval=0.79-1.88) ($p=0.352$) (Table 1).

Discussion

In recent years, there is an ongoing increase in the incidence of ectopic pregnancy. For example, incidence of ectopic pregnancy was 0.5% of all pregnancies in the U.S. in 1970 while it was reported as 1.97% in 1992. 10 Ectopic pregnancy also comprises 9-13% of pregnancy associated deaths, and it still rates the first among pregnancy associated deaths during the first trimester.¹¹ Various risk factors increasing the potential of ectopic pregnan-

cy have been reported so far, and among them most frequent ones are history of infertility and its treatment, previous pelvic infection, previous ectopic pregnancy, previous tubal surgery, smoking, advanced age and RIA use.¹²⁻¹⁵ It is known that risk for ectopic pregnancy also increases following the abdominal surgery, particularly pelvic surgical interventions.⁶ For years, it has been also considered that as a pelvic surgical intervention, caesarean operation may also increase the risk for ectopic pregnancy, and several cohort and case controlled studies have been conducted to clarify it.

While a considerable increase is observed in the caesarean rates in recent years, complications

related with caesarean operation have become a frequent subject to dispute. Although no sound data is available about the caesarean rates in our population, it has been considered that caesarean rates highly increased in latest years, and a major of this increase is not related with medical issues, and particularly women with higher educational levels and income contributed much to the increase in the caesarean rates.¹⁶ This situation, unfortunately reminds us the Brazilian case. In Brazil where delivery by caesarean section is almost perceived as an indication of higher status, the caesarean delivery rates are 50% in state hospitals, and almost 100% in private hospitals.¹⁷ Of course, caesarean operations carried out without any medical rationale are accompanied with severe complications in the short and long term. Maternal complications related with caesarean operation that may develop in the short term include infection, bleeding, injuries of vicinal organ and anesthetic complications.¹⁸ It was reported that the long-term effects may include development of complications such as uterine rupture in subsequent pregnancies,^{4,19} placenta previa²⁰ and placenta accreta,²¹ abruptio placentae, stillbirth at subsequent pregnancy with unknown etiology,²² pelvic adhesion and associated secondary infertility and ectopic pregnancy.²³ Based on all these reasons, necessary precautions have been taken in many developed countries in order to reduce caesarean rates, and achieve the ideal rate (15%) recommended by the World Health Organization (WHO).²⁴

In a cohort study carried out in 1996, Hemminki et al. reported that caesarean operation moderately increased the risk for ectopic pregnancy in the long term, and the increase in the risk was statistically significant as 1.28 fold.²³ In another study by the same group of researchers, the rate was higher and relative risk was 1.4-1.7.²⁵ However, some case controlled studies carried out during the same period reported that risk for ectopic pregnancy increases following the caesarean operation,²⁶ but no increase was observed in the risk in some other studies,^{9,27} as it can be seen, results of studies on this issue are controversial and no studies can be found during the last decade where in fact a remarkable increase was observed

in the caesarean rates. Therefore, the present study including the caesarean operations carried out in the last decade in a training hospital is crucial in demonstrating if caesarean operations increase the risk for ectopic pregnancy, a serious complication of pregnancy. Although it is generally known that retrospective studies are less reliable compared to the prospective studies, and some factors that may have an impact on the results of the study can not be efficiently controlled and thus they may be biased, such studies can be preferred, especially when the number of cases is restricted as they can be conducted in the short term with restricted number of patients. Therefore, we believe that the present study can provide an idea about the subject even though it is a retrospective and controlled study carried on a few subjects. We found an Odds ratio of 1.22 (95% confidence interval=0.79-1.88) ($p=0.352$). This ratio is generally parallel to the ones obtained in previous studies.^{23,25,26} Although the result does not reach a statistically significant value, ectopic pregnancy should also be taken into consideration among long term complications of caesarean operation as a pelvic surgical intervention.

Conclusion

In conclusion, remarkable increase has been observed both in the incidence of ectopic pregnancies and rate of caesarean deliveries in recent years. Following the caesarean operation, which should be considered as a pelvic surgical operation, there might be an increase in the incidence of ectopic pregnancy as there might be several other complications in the long term. This tendency, which may be harmful in the long term, should be kept in mind particularly in caesarean operations carried without any medical rationale; unnecessary caesarean operations should be avoided, preferring the physiological and natural way as much as possible. In the present study, the Odds ratio was calculated as 1.22 after all other factors increasing the risk for ectopic pregnancy were taken under control, and statistically significant levels were not reached. Therefore, further multi-centered, prospective studies including more cases of ectopic pregnancies with longer follow-up periods are required.

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Spontaneous Abortion and Thyroid Functions

Melahat Dönmez, Tolga Şişli, Alev Atuş, Yavuz Aydın

3rd Clinics of Gynecology and Obstetrics, Şişli Etfal Training and Research Hospital, İstanbul

Abstract

Background and Objective: To investigate thyroid functions as an etyologic factor in spontaneous abortions.

Methods: We performed thyroid function tests in 60 patients having spontaneous abortion without any known etiology between 5 to 20 weeks of gestation and compared them with these of 40 pregnant women of same gestational weeks and known to reach term and had a healthy labor.

Conclusions: There may be subclinical hypothyroidism in spontaneous abortion group and this may be responsible from some of the spontaneous abortions.

Keywords: Pregnancy, abortion, thyroid, T4, TSH.

Spontan abortus ve tiroit fonksiyonları

Amaç: Spontan abortus etyolojisinde tiroit fonksiyonlarının yerini araştırmak.

Yöntem: 5-20 gebelik haftalarında spontan abortus yapan ve abortus etyolojisi bilinmeyen 60 hastanın tiroit fonksiyonları, aynı gebelik haftalarında bulunan ve daha sonra miada ulaşarak sağlıklı doğum yapan 40 gebenin tiroit fonksiyonları ile karşılaştırıldı.

Bulgular: Spontan abortus yapan grubun hem total T3,T4 hem de serbest T3 ve serbest T4 seviyeleri miada ulaşan gruptan anlamlı olarak düşük, TSH değeri ise anlamlı olarak yüksekti.

Sonuç: Abortus grubunda klinik olmasa bile subklinik hipotiroitizm mevcut olabilir ve bu da spontan abortusların bir bölümünden sorumludur.

Anahtar Sözcükler: Gebelik, abortus, tiroit, T4, TSH.

Introduction

Diagnosis of thyroid diseases in pregnancy becomes difficult due to some physiological changes that remind hyperthyroidism. During pregnancy, requirements of thyroid hormone and iodine are increased.^{1,2} Synthesis of thyroid binding globulin (TBG) is raised in pregnancy with estrogen effect, resulting in elevated total T3 (TT3) and total T4 (TT4) levels. Increase in total fractions

through the end of pregnancy leads to decrease in free fractions, which in turn results in stimulation of TSH and consequently enlargement of the thyroid gland.^{3,4} Renal loss of iodine as a result of increased glomerular filtration is increased in pregnancy. Fetus takes up only thyroid from the mother for thyroid hormone synthesis; daily iodine requirement of a pregnant woman is 200 mg. 5 T hyroid is also stimulated by the human chorionic

gonadotropin (hCG). Therefore, in the first trimester where hCG rapidly increases, TSH can decrease while FT3 and FT4 can increase. The hCG values are at peak at gestational week 10 whereas TSH is at lowest level. When hCG is reduced to its stable value as the pregnancy advances, TSH levels are increased, establishing a new balance. The temporary increase in FT4 disappears during the second trimester.^{6,7} TBG continues to increase by the gestational week 20, and thus total thyroid hormones continue to increase by that period, but free fractions remain unchanged in their new balanced status following the first trimester.^{1,3,6} Fetal hormone synthesis is initiated at gestational week 10 by means of TSH secretion from fetal hypophysis, and it is maintained at lower levels until the gestational week 20 while the synthesis is facilitated from that week, sustaining the increase until the end of pregnancy.^{5,6,8}

The prevalence of hyperthyroidism is 0.05-0.02% in pregnancy. The most valuable tests in diagnosis are determination of TSH reduction and FT4 increase. However, as previously indicated, a 20% reduction can be observed physiologically in TSH during the first trimester. Graves disease is the most common cause of hyperthyroid in pregnant women. Other causes may include subacute thyroiditis, toxic nodular goiter and toxic solitary nodules.^{9,10} The most common maternal complications observed in hyperthyroid are abortus, premature delivery, abruptio placentae, preeclampsia, congestive heart failure and hyperemesis gravidarum while most common fetal complications are neonatal thyrotoxicosis, intrauterine growth retardation, prematurity, stillbirth and congenital anomalies.^{1,9,11,12}

Prevalence of permanent hypothyroidism in pregnancy is 0.11% while its temporary (sub-clinic) prevalence is 0.19%. The most common cause of hypothyroidism in pregnancy is Hashimoto thyroiditis or disorders treated by thyroid ablation due to thyrotoxicosis (thyroidectomy or radioactive iodine treatment).^{3,8,13} The most valuable diagnostic tests are assessments of FT4 and TSH. Diagnosis for primary hypothyroidism is made by lower FT4 and higher TSH levels. The maternal complications reported with hypothyroidism include abortus, premature delivery, hypertensive problems and postpartum bleeding, and the most severe complication is congestive heart failure while fetal complica-

tions are congenital anomalies, lower birthweight, stillbirth, prematurity and mental retardation.^{14,15}

We evaluated the presence of thyroid function disorder in the etiology of spontaneous abortus by comparing the thyroid functions of women whose pregnancy resulted in spontaneous abortus with those of normal pregnant women.

Methods

The study group included 60 patients who presented to the clinic with complaints of vaginal bleeding, pelvic pain and tissue discharge, and diagnosed with spontaneous abortus at gestational weeks 5-20 while the control group consisted of 40 pregnant women who were at the same gestational weeks and then reached term and gave birth. Serum total T3 (TT3), total T4 (TT4), TSH, free T3 (FT3), free T4 (FT4) were studied in both groups. Diagnostic criteria for spontaneous abortus were uterine bleeding, presence of cervical dilatation, pelvic pain associated with uterine contraction, tissue discharge (complete or partial moles), damaged or absent pregnancy pouch in vaginal ultrasonography (thickened and irregular endometrium), absence of fetal cardiac activity or presence of placental detachment and hematoma. No restriction was imposed on age, parity and gravida in the pregnant women. The patients with metabolic or endocrinologic disorders were excluded. Cases that may effect the uteroplacental circulation such as ones with multiple pregnancy, genital organ anomaly, uterine myoma, advanced malnourishment, exposure to toxic substances, diabetes, hypertension, autoimmune disease and infection (TORCH) were also excluded. Patients in each group underwent a thorough physical and thyroid gland examination. Demographic characteristics of patients were determined by means of anamnesis. The gestational ages based on the start of the last menstruation period were confirmed by measurements of gestational pouch and crown-rump length. TT3, TT4, FT3, and FT4 measurements were carried out by chemiluminescence systems (ACS: 180+A Chiron Diagnostics, USA). And, TSH measurements were done by two-site sandwich immunoassay, automated chemiluminescence system, again using the direct chemiluminescence technology. Statistical analyses were performed by SPSS 10.0. Thyroid function tests of both groups were compared by Student-t test.

Results

No significant difference was found between the abortus group and the control group in the parameters such as age, parity, gravida and gestational age ($p > 0.05$). The mean age was 24.38 ± 3.34 years in the abortus group, and 24.14 ± 4.66 years in the control group. TT4 values were 9.93 ± 1.28 $\mu\text{g}/\text{dl}$ in the abortus group, and 11.39 ± 1.41 $\mu\text{g}/\text{dl}$ in the control group where the TT4 value in the abortus group was very significantly lower ($p < 0.001$) (Table 1). FT3 values were 3.22 ± 0.82 pg/ml and 4.19 ± 1.14 pg/ml in the abortus group and control group respectively, and FT3 was significantly lower in the abortus group ($p < 0.001$). The mean FT4 values were 1.11 ± 0.31 ng/dl and 1.45 ± 0.69 ng/dl in the study and control groups, respectively, and again in the abortus group FT4 value was found significantly lower than the value in the control group. When TSH values were compared, the mean values were 1.80 ± 1.18 mIU/dl and 0.97 ± 1.45 mIU/dl in the abortus and control groups, respectively, and TSH was significantly higher in the study group ($p < 0.05$). TT3 values in the abortus and control groups were 2.61 ± 0.51 ng/ml and 2.88 ± 0.48 ng/ml , respectively, and there was a statistically significant difference between two groups ($p < 0.05$).

Table 1. Comparison of thyroid function tests in spontaneous abortus and control groups.

	TSH (mIU/dl)	TT4 ($\mu\text{g}/\text{dl}$)	TT3 (ng/dl)	FT4 (ng/ml)	FT3 (pg/ml)
Abortus Group	1.80 ± 1.18	9.93 ± 1.28	2.61 ± 0.51	1.11 ± 0.31	3.22 ± 0.82
Control Group	0.97 ± 1.45	11.39 ± 1.41	2.88 ± 0.48	1.45 ± 0.69	4.19 ± 1.14
P	$P < 0.05$	$P < 0.001$	$P < 0.05$	$P < 0.001$	$P < 0.001$

Discussion

In spite of many studies available regarding the physiological changes in the thyroid during pregnancy, it is uncertain if functional disorders of the thyroid play a role in the etiology of spontaneous abortus.⁶ Maruo et al. proposed that maternal thyroid hormone levels are one of the endocrine factors responsible from the abortus threat. They reported that 32 patients diagnosed with abortus threat had higher FT3 and FT4 levels compared to 21 pregnant women at the same gestational week, and TSH level was indifferent.¹⁶ Ross et al. indicat-

ed that functional disorders of the thyroid is not effective in the outcomes of miscarriage.¹⁷

In three different studies, Pratt, Bussen and Singh found out that the thyroid autoantibody levels were higher in women with recurrent miscarriages during the first trimester than in the normal pregnant women.^{18,19,20} It was suggested that those autoantibodies, which can also be higher in the euthyroid patients, may produce a threat for miscarriage in the subsequent pregnancy. In a prospective study by Rushworth et al., it was concluded that thyroid antibodies are not associated with spontaneous abortus,²¹ which was also supported by Esplin et al.²² As it can be seen from these studies, the role played by neither thyroid hormone levels (total hormone or free fraction) nor thyroid autoantibody levels in the etiology of spontaneous abortus and/or recurrent abortus is clear. However, we evaluated only the thyroid function tests, as there is a tendency in recent prospective studies to emphasize that thyroid autoantibodies are not responsible from spontaneous abortus.

Lower TT3, TT4, FT3, FT4 levels and higher TSH values we obtained in the spontaneous abortus group are an indication of the presence of a hypothyroidic situation in this group. It may lead to slowing down in the necessary synthesis and oxidation procedures, resulting in termination of the pregnancy. Thus, there are several publications indicating that ratio of spontaneous abortus rises two-fold in women with hypothyroid.^{3,5,6,8} Again Matsua et al.³² showed that FT3 and FT4 values of women whose pregnancy was terminated by abortus were significantly lower than those with a healthy continuation of pregnancy in thyroid function tests performed following the clinic diagnosis of abortus imminence, which is parallel to our findings.¹⁶ All of these studies including our study indicate the frequency of subclinic hypothyroidism in pregnancy and its association with spontaneous abortus.

Subclinic hypothyroidism can be evaluated in two different groups where TSH is always higher than 10 mIU/L and lower than 10 mIU/L . There is a consensus regarding that subclinic hypothyroidism should be treated with thyroxine in the subgroup with higher TSH.²³ Particularly pregnancy and/or thyroid peroxidase antibody positive cases require immediate treatment. In the subgroup with TSH lower than 10 mIU/L , no consen-

sus exits regarding the treatment. Need for treatment in this group of pregnancies can be clarified by further studies.^{23,24}

Conclusion

Thyroid function disorders play a role in the etiology of at least some part of spontaneous abortus and/or recurrent abortus, and based on our results spontaneous abortus seems more associated with subclinic hypothyroidism. Therefore, TSH levels should be measured as a routine screening test in all pregnancies.

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Urinary Tract Infection in Pregnancy

Levent Tütüncü¹, Nurittin Ardic², Ercüment Müngen¹, Ali Rüştü Ergür¹, Y. Ziya Yergök¹

¹Clinics of Gynecology and Obstetrics, GATA Haydarpaşa Training Hospital, İstanbul

²Clinics of Microbiology and Clinical Microbiology, GATA Haydarpaşa Training Hospital, İstanbul

Abstract

Background and Objective: Urinary infection is one of the most common medical complications of pregnancy. It occurs in 5-10% of pregnant women and may lead to serious fetal morbidity like prematurity and low-birth-weight infants, and may result in maternal morbidity, like renal dysfunction, sepsis, respiratory insufficiency and even maternal death if it's progressed to acute pyelonephritis. We retrospectively evaluated the prevalence of urinary infection, causing microorganisms, risk factors and complications in our population.

Methods: The medical files of 1934 patients who gave birth in our department within last two years have been retrospectively evaluated. 1326 women who had a routine antenatal care and at least one screening urine culture for bacteriuria had been included to the study. Women who had positive urine culture (n=106) had been compared with those who had negative result (n=1220) for demographic characteristics and maternal/fetal complications.

Results: 1326 pregnant women were studied, of whom 106 (16.98%) were identified to have asymptomatic bacteriuria. The level of education was lower in asymptomatic bacteriuria group, but the prevalence of preterm delivery, low-birth-weight infants and anemia were higher than the control group. Thirty cases of acute pyelonephritis (2.26%) were hospitalized during the study period.

Conclusion: Urinary tract infection during pregnancy can cause serious maternal and perinatal morbidity. All pregnant women should be screened for bacteriuria by urine culture at least once and they should be treated if the results are positive. Acute pyelonephritis during pregnancy is a serious problem which should be treated as inpatients with appropriate parenteral antibiotics.

Keywords: Pregnancy, urinary tract infection, asymptomatic bacteriuria, pyelonephritis.

Gebelikte üriner enfeksiyon

Amaç: Üriner enfeksiyon gebelikte en sık görülen tıbbi komplikasyonlardan birisidir. Gebeliklerin yaklaşık %5-10'unda görülen üriner enfeksiyonlar, zamanında ve etkin bir şekilde tedavi edilmediğinde, erken doğum ve düşük doğum ağırlığı gibi ciddi fetal sorunlara yol açabileceği gibi, akut pyelonefrit tablosuna ilerlediği takdirde renal yetmezlik, sepsis, solunum yetmezliği ve hatta ölüm gibi çok ciddi maternal sorunlara da neden olabilirler. Bu konuda ülkemizdeki durumu özetleyebilmek amacıyla, kliniğimizde takip edilen gebelerdeki üriner enfeksiyon sıklığı, risk faktörleri, enfeksiyon etkenleri ve görülen komplikasyonlar retrospektif olarak araştırıldı.

Yöntem: Kliniğimizde son 2 yıl içerisinde doğum yapan 1934 hastanın dosyaları retrospektif olarak tarandı. Bu kadınlardan gebelik takibi kliniğimizde yapılan ve gebeliği süresince en az bir kez tarama amaçlı idrar kültürü yapılmış olan 1326 gebe çalışmaya dahil edildi. İdrar kültürü pozitif raporlanan gebelerle (n=106), kültür sonucu negatif olanlar (n=1220) genel özellikler ve maternal/fetal komplikasyonlar açısından birbirleri ile karşılaştırıldı.

Bulgular: Çalışmaya dahil edilen 1326 gebeden 106 (%16.98) tanesinde asemptomatik bakterüri saptandı. Bu gebelerde eğitim düzeyi daha düşüktü, erken doğum, düşük doğum ağırlığı ve anemi sıklığı, asemptomatik bakterüri saptanmayan kontrol grubuna nazaran daha fazla bulundu. Toplam 30 (%2.26) hasta akut pyelonefrit nedeniyle yatırılarak tedavi edildi.

Sonuç: Üriner enfeksiyonlar gebelerde ciddi maternal ve perinatal sorunlara neden olabilir. Bu nedenle tüm gebeler gebelik kontrolleri esnasında en az bir kez bakterüri açısından taranmalı ve pozitif sonuç çıktığında uygun antibiyotik ile tedavi edilmelidir. Gebelikte akut pyelonefrit, hastane ortamında, parenteral antibiyotiklerle tedavi edilmesi ve yakından takip edilmesi gereken ciddi bir sorundur.

Anahtar Sözcükler: Gebelik, üriner enfeksiyon, asemptomatik bakterüri, pyelonefrit.

Correspondence: Dr. Levent Tütüncü

GATA Haydarpaşa Eğitim Hastanesi, Kadın Hastalıkları ve Doğum Kliniği, İstanbul

e-mail: ltutuncu@yahoo.com

Introduction

Urinary tract infection is one of the most common medical complications of pregnancy together with anemia and hypertension, and it occurs approximately in 5-10% of all pregnancies.^{1,2} Urinary infection can be defined as the proliferation of active microorganisms inside the urinary channel which are harmful to their environment. Bacteriuria is the isolation of bacteria in the urine specimen.³ Presence of 1×10^5 or more colony forming units (CFUs) of the same active microorganism per milliliter in 2 consecutive urine specimens has been a historically used threshold value for the diagnosis of bacteriuria.

Some physiological changes occurring during the pregnancy expedite the emergence of urinary infections and cause a higher incidence. As a result of hormonal changes, tonus of urinary bladder and ureter is reduced, and subsequently dilatation in the ureter and renal pelvis, incidence of urinary stasis and vesicourethral reflux increase. Increased plasma volume and glomerular filtration rate result in reduction in the urinary concentration. Furthermore, there is an increase in the incidence of glycosuria and aminoaciduria and a reduction in the resistance of urinary tract system against bacteria in pregnancy. Depending on all these developments, the incidence of symptomatic urinary tract infections is increased in pregnancy.⁴

Urinary tract infections can be seen in three different forms in pregnancy; asymptomatic bacteriuria, acute cystitis or acute pyelonephritis. The incidence of asymptomatic bacteriuria, which can be described as bacteriuria without specific symptoms of the urinary tract infection, has been reported between 2-13% in pregnancy in our population⁵ and all over the world, and this rate is not higher than the non-pregnant rate of the same age group.⁶ However, physiological changes in pregnancy lead to a severe course of the problem. It has been demonstrated that if untreated, asymptomatic bacteriuria increased the frequency of premature delivery and neonates with low birthweight⁷, and also it was likely to cause acute pyelonephritis at a rate of 15-30%.⁸ Acute pyelonephritis is a serious clinical presentation which can be seen in 1-2% of all pregnancies, and may cause critical fetal-maternal adverse effects.⁹

Based on all, we planned a retrospective study in order to identify the incidence of urinary tract infection and complications in the pregnant women followed-up by our clinic and to describe the potential risk factors and reveal the effectiveness of the treatment.

Methods

Files of 1934 patients who gave birth in our clinic over 24 week's gestation between 1 January 2003 and 31 December 2004 were retrospectively evaluated. As it is a routine to get urine specimen from all pregnant women presented to our clinic for antenatal follow-up, 1326 pregnant women, who visited the clinic at least twice for antenatal control and had her urine culture done at least once for screening purposes during the pregnancy and had no fetal anomaly, were included in the study. Since there was not a complete correlation between the results of cytometric urine analysis and the results of urine culture and detection of pyuria is not an efficient criteria to distinguish between symptomatic and asymptomatic urinary infections,¹¹ detection of pyuria as a result of cytometric urine analysis was not admitted as a diagnosis of the urinary tract infection, and only patients with a result of urine culture were included. Then, clinic files of 1326 patients included in the study were individually examined, and data about demographic characteristics of patients, complications emerged during the course of pregnancy, incidence of asymptomatic bacteriuria and symptomatic urinary tract infection, birthweights of neonates and neonatal complications were collected. Deliveries earlier than 37 week's gestation were regarded as preterm; hematocrite value less than 30% detected during the labor as anemia; and birthweights less than 2500 gr as low birthweight. Results of the urine culture of patients included in the study were retrospectively screened by means of the automation programme of the hospital in coordination with the clinic of microbiology. The results were also evaluated in terms of incidence of the infecting organisms identified.

Urine specimens of the patients were obtained from the first urine in the morning in sterile cups following the appropriate cleaning as moderate-

flow urine specimen. Specimens were inoculated with a 0.001 ml calibrated loop onto a 5% sheep blood and eosin methylene blue (EMB) agar, and evaluated following an incubation at 37°C for 18 to 24 hours. Presence of 1×10^5 or more CFUs of the same active microorganism per each millimeter of the urine specimen was regarded as positive outcome. Pregnant women whose results of 2 subsequent urine cultures were positive, but who had no symptoms and clinical complaints were diagnosed with asymptomatic bacteriuria, and all those patients were treated by cephuroxime axetil (250 mg twice a day) for a period of 5 days if the organism was sensitive, but with appropriate antibiotics if it was insensitive. Patients who had positive or negative outcome of urine culture during the routine visit control, but presented with clinical symptoms and complaints such as fever higher than 38°C, flank pain and costovertebral angle tenderness, and diagnosed with acute pyelonephritis were all admitted to the hospital, and treated with parenteral antibiotics after obtaining specimens for urine culture. These patients received sodium cephotaxime sodium (1 gr, iv, 2x1) as treatment agent which lasted 24 hours after the disappearance of clinical findings. In patients with insufficient response to the treatment, parenteral treatment was continued with appropriate antibiotics after receiving the outcome of the urine culture. In all patients who were treated in accordance with the diagnosis of acute pyelonephritis, the treatment was continued with oral antibiotics after the acute period, and those patients were evaluated again with urine culture two weeks after the end of the treatment. In this control, the pregnant women who had a positive urine culture, but no clinical symptoms were prophylactically treated with nitrofurantoin (100 mg, per-oral, 1x1) during the rest of their pregnancy, and this treatment lasted until the 37 week's gestation. In patients who had a negative urine culture before the parenteral treatment in spite of clinical diagnosis of acute pyelonephritis, as there may be some organisms like *U.urealyticum* ve *M. hominis* present other than routinely examined bacteria,¹² they were also examined for such organisms. Mycoplasma-IST (bio Merieux, Fransa) media was inoculated in accordance with the instructions of the manufac-

turer and the growth was evaluated following an incubation of 24 to 48 hours at 37°C. The patients with *U. urealyticum* and *M. hominis* were treated with erythromicine (250 mg, per-oral, 4x1) for a period of 14 days.

1326 pregnant women who were included in the study were divided into two groups as with/without asymptomatic bacteriuria, and then compared in terms of overall characteristics and maternal/fetal complications. Also pregnant women who were treated due to acute pyelonephritis were evaluated in aspects of overall characteristics and complications, but no statistical comparison was made with normal pregnant women due to restricted number of cases. Only ratios reflective of our population were calculated.

Statistical analyses were made by SPSS Ver. 10.0 (Chicago, IL, ABD) programme using Fisher exact, Chi-square and matched t-test, and $p < 0.05$ was considered statistically significant.

Results

A total of 1934 medical files were retrospectively evaluated, and 1326 pregnant women who met the study criteria were included in the study. Evaluations showed that a total of 110 (8.9%) cases had preterm delivery, 98 (7.39%) cases had preeclampsia/eclampsia, 93 (7.01%) cases had anemia, 101 (7.61%) had low birthweight and 25 (1.8%) cases had perinatal infant death. Of pregnant women included in the study, 510 (38.46%) had caesarean delivery, and the remaining 816 (61.54%) had normal vaginal delivery. Analysis of culture results showed that a total of 106 (7.99%) pregnant women had positive urine culture, and they comprised the group diagnosed with asymptomatic bacteriuria. The most common causative organism in pregnant women with bacteriuria was *E. coli* (84.9%) in 90 women, followed by *Staphylococcus saprophyticus* (5.66%) in 6 women, methicillin-resistant *Staphylococcus aureus* (3.77%) in 4 women, methicillin-sensitive *Staphylococcus aureus* (2.83%) in 3 women and other Enterobacteria (2.83%) in 3 women respectively.

Of 1326 pregnant women included in the study, comparison of 106 women whose routine

urine culture was positive, i.e. who received the diagnosis of asymptomatic bacteriuria, with 1220 pregnant women with negative urine culture in terms of demographic characteristics showed that there was no significant difference between the groups except for the educational level ($p>0.05$), and the educational level was significantly lower in the group of pregnant women with asymptomatic bacteriuria ($p=0.032$), (Table 1). When maternal and fetal complications in both groups were compared, no significant difference was observed in delivery method, incidence of preeclampsia/eclampsia, incidence of pyelonephritis and peripartum fetal death rates ($p>0.05$) (Table 2). However, 16.87% of pregnant women with asymptomatic bacteriuria had a preterm delivery earlier than the week 37 while this ratio was found 7.29% in the group without asymptomatic bacteriuria and intergroup Odds Ratio was calculated as 2.50 (95% confidence interval = 1.44-4.34) ($p=0.001$) (Table 2). When both groups were compared in the incidence of low birthweights, the intergroup Odds Ratio was found 1.98 (95% confidence interval= 1.08-3.62) ($p=0.024$) (Table 2). Furthermore, when the incidence of anemia was compared between both groups, it was observed that the incidence of anemia was higher in pregnant women with asymptomatic bacteriuria (12.26%) than in the group without asymptomatic bacteriuria (6.55%) (Odds Ratio= 1.99) (95% confidence interval= 1.06-3.71) ($p=0.027$) (Table 2).

Of 106 pregnant women with diagnosis of asymptomatic bacteriuria, 65 (61.3%) came back

for culture control 2 weeks after the treatment while 41 women (38.7%) didn't show up for control until the delivery. The bacteria was not isolated in 38 cultures (92.7%) following the treatment, and thus the treatment was considered successful in these pregnant women. In the remaining two women, one had a reinfection with another microorganism, but an analysis showed that her specimen was inappropriate, therefore, it was concluded that growth of bacteria was resulting from contamination. In the other woman with persistent infection, there was a history of urinary stone.

Among 1326 pregnant women included in the study, a total of 30 (2.26%) patients were admitted to our clinic and treated with a diagnosis of acute pyelonephritis during that period. Four of those patients were among the group of patients who had positive urine culture and had been diagnosed with asymptomatic bacteriuria, and thus received prophylactic treatment. The previous urine culture was negative in the remaining 26 patients. The incidence of acute pyelonephritis was slightly higher in the group with asymptomatic bacteriuria with 3.77% compared to the group without asymptomatic bacteriuria (2.13%), but the difference was not statistically significant (Odds ratio = 1.80), (95% confidence interval=0.61-5.26), ($p=0.214$). Of those, the number of patients who had a positive urine culture reprocessed upon their presentation to the clinic with a diagnosis of acute pyelonephritis was 19 (63.3%). Also, in spite of clinical diagnosis of acute pyelonephritis, eight of 11 patients with a negative urine culture in the repeated test had *U. urealyticum* while one had *M. hominis*. In two patients, no growth was observed in the urine culture although the clinical findings were in com-

Table 1. Overall characteristics of the pregnant with and without asymptomatic bacteriuria.

Characteristics	With asymptomatic bacteriuria n=106	Without asymptomatic bacteriuria n=1220	p value
Mean age (year±SD)	26.43±4.5	27.21±5.6	0.436
Mean parity (±SD)	0.6±0.7	0.59±0.7	0.474
Mean educational level (year±SD)	7.31±3.03	8.88±3.44	0.032
Previous preterm delivery (<37 hf)	5 (%4.71)	49 (%4.01)	0.726
Concomittant medical disorders (Diabetes etc.)	4 (%3.77)	41 (%3.36)	0.484

SD: Standard deviation

Table 2. Asymptomatic bacteriuria and maternal/fetal complications.

	With asymptomatic bacteriuria n=106	Without asymptomatic bacteriuria n=1220	Odds Ratio (95% confidence interval)	p value
Preterm delivery (<37 week)	18 (%16.98)	92 (%7.54)	2.50 (1.44-4.34)	0.001
Caesarean delivery	45 (%42.45)	465 (%38.11)	1.19 (0.80-1.79)	0.379
Preeclampsia/eclampsia	9 (%8.49)	89 (%7.29)	1.17 (0.57-2.41)	0.652
Acute pyelonephritis	4 (%3.77)	26 (%2.13)	1.80 (0.61-5.26)	0.214
Anemia (<30% hematocrite)	13 (%12.26)	80 (%6.55)	1.99 (1.06-3.71)	0.027
Low birthweight (<2500 gr)	14 (%13.20)	87 (%7.13)	1.98 (1.08-3.62)	0.024
Perinatal death	2 (%1.88)	23 (%1.88)	1.0008 (0.23-4.30)	0.607

pliance with the presentation of acute pyelonephritis. Overall characteristics and complications of the pregnant women with acute pyelonephritis are shown at Table 3.

Table 3. General characteristics and complications of the pregnant women with acute pyelonephritis.

Mean age (year±SD)	25.9±5.3
Mean parity (parite) (±SD)	0.54±0.6
Previous preterm delivery (<37 week)	5 (%16.6)
Low birthweight (<2500 gr.)	10 (%33.3)
Premature delivery (<37 week)	8 (%26.6)
Caesarean delivery	10 (%33.3)
Preeclampsia/eclampsia	4 (%13.3)
Anemia (<30% hematocrite)	9 (%30)
Mean hospitalization period (day±SD)	4.36±2.47
Mean IV antibiotics use (day±SD)	4.0±1.08

SD: Standard deviation

Discussion

Urinary tract infection is one of the most common medical complications of pregnancy, and it presents as asymptomatic bacteriuria in nearly 2 to 13%, and symptomatic infection in 1 to 2% of all pregnant women.¹³ Although symptomatic urinary tract infections consist of acute cystitis and acute pyelonephritis presentations, it is not easy to distinguish symptoms of cystitis and asymptomatic bacteriuria due to frequent complaints of suprapubic pain and polyuria in pregnancy. Also, infecting organisms leading to asymptomatic bacteriuria and acute cystitis are frequently different, and asymptomatic bacteria can progress into pyelonephritis,

but it is not a cause of cystitis. Therefore, we considered conventional acute pyelonephritis as the presentation of symptomatic urinary infection, and pregnant women who had no or unspecific complaints and bacteriuria in the urine culture processed for screening purposes were considered having asymptomatic bacteriuria. Based on this, frequency of asymptomatic bacteriuria and acute pyelonephritis is 7.99% and 2.26% respectively in our population. In another study conducted in our country, the reported frequencies for asymptomatic bacteriuria and symptomatic urinary infection were 10.6% and 4.6% respectively.⁵ Uncu et al. found an asymptomatic bacteriuria rate of 9.3%, and also an acute pyelonephritis frequency rate of 0.5% in the group who underwent routine screening and treatment while it was 2.1% in the group without any screening.¹⁴ We have found a slightly higher rate of acute pyelonephritis compared to the results of Uncu et al. It may result from the detection of *U. urealyticum* and *M. hominis* induced infections that cannot be determined by routine culture processings, but by special mycoplasma culture, in nearly one third of the patients diagnosed with acute pyelonephritis.

Although it has been recently reported that a few tests like catalase activity¹⁵, nitrite¹⁶ or Gram's staining¹¹ can be used to evaluate the urine specimen for the diagnosis of urinary tract infections, culture of moderate-sterile urine has become the golden standard in the diagnosis of bacteriuria as the specificity and sensitivity of above tests are insufficient. Only half of the pregnant women with bacteriuria are diagnosed with pyuria evaluation in

the urine alone.¹¹ According to the commonly accepted description, presence of 10⁵ or more CFUs of the same active microorganism per 1 milliliter of the sterile urine specimen obtained at least 2 consecutive times is necessary to make a diagnosis for asymptomatic bacteriuria.¹⁷ However, it has been proposed that a single urine culture from the specimen obtained during the first trimester of pregnancy would be sufficient in order to identify the frequency of bacteriuria in pregnancy and treat it, if necessary, and thus all pregnant women should be screened at least once.¹⁸ On the other hand, if the conditions are appropriate, and it is certain that the pregnant woman will re-visit for control purposes, it would be a better approach to confirm the diagnosis with a second urine culture in women whose urine culture was positive due to high risk of contamination. Also, it is cost effective to conduct a routine screening in populations where incidence of bacteriuria is over 2% and risk for developing acute pyelonephritis in those with bacteriuria is over 13%.¹⁹ Therefore, all pregnant women who present to our clinic for routine pregnancy follow-up are required to give at least one urine specimen, and we used the urine culture as a criteria in the diagnosis of urinary tract infections in our study.

E. coli is responsible from approximately 90% of urinary tract infections in sexually active women, which is followed by *Staphylococcus saprophyticus*.¹⁷ It is almost the case in pregnant women, and the most common organisms of the urinary tract infection in pregnancy include *E. coli*, *Staphylococcus saprophyticus*, *Proteus mirabilis*, *Klebsiella pneumoniae*, group B streptococci and rarely *U. urealyticum* and *M. hominis*.²⁴ The most common organism in our study was *E. coli*, followed by *Staphylococcus saprophyticus*, methicillin-resistant *Staphylococcus aureus*, methicillin-sensitive *Staphylococcus aureus* and other Enterobacteria respectively, which is a parallel finding to the literature.

Many studies conducted so far reported that both inefficiently treated asymptomatic bacteriuria and acute pyelonephritis may lead to preterm delivery, low birth weight, and even perinatal death, which have been also supported by several

meta-analyses.^{7,20} In a very recent systematic review, it has also been reported that treatment of asymptomatic bacteriuria in pregnant women with antibiotics reduced the risk for acute pyelonephritis and potential preterm delivery.²¹ As a result, in case asymptomatic bacteriuria is detected in pregnancy, it must be properly treated in order to avoid any maternal and fetal complications that may develop.^{2,6,18} We also treated all pregnant women diagnosed with asymptomatic bacteriuria. However, the ratio of preterm delivery before 37 week's gestation, delivery of neonates less than 2500 gr and anemia was higher in pregnant women with asymptomatic bacteriuria in our study. It may be associated with non-attendance of a major part of pregnant women (38.7%) who were included in the study and treated due to asymptomatic bacteriuria for the control visit after receiving the treatment until the delivery, non-attendance for control culture after the treatment or non-compliance with the treatment. It is already indicated in the literature that risk for recurrent bacteriuria is higher in a later period in spite of treatment, and it should be monitored with follow-up cultures.¹³ Also, it has been found that the educational level of pregnant women in the asymptomatic bacteriuria group is significantly lower. Therefore, it may be considered that the frequency of preterm delivery, low birthweight and anemia in this group may not be directly associated with asymptomatic bacteriuria, but it may be related with lower socioeconomic status and insufficient antenatal care.

It is well known that in case asymptomatic bacteriuria is detected in pregnancy, it should be treated, however it is still controversial which treatment agent should be used and how long the treatment should last. Based on this, a systematic review carried out in 2004 showed that although a wide variety of antibiotics has been used in the past, almost all of the agents used were effective, and no superiority has been demonstrated for any of them.²² Besides, the most commonly used agents are mainly penicillins and cephalosporins whose teratogenic effect has not been demonstrated yet, and β -lactam antibiotics, phosphomycin and nitrofurantoin.²³ Such infections can be successfully treat-

ed by oral cephalosporins even though there is a high level of resistance to penicillins in recent years. All pregnant women with bacteriuria in our study was treated by cephuroxim axetil (250 mg, twice a day for 5 days), which resulted in 92.7% success. Different results exist regarding the treatment period of asymptomatic bacteriuria in the literature. Some studies report that a single dose therapy is efficient,²⁴ some others suggest three, five or seven days of treatment periods.⁴ A systematic review showed that there is not enough evidence so that it can not be exactly described,²⁵ however Infectious Diseases Society of America recommends that duration of antimicrobial therapy should be 3-7 days.¹⁸ In our study, a successful outcome was achieved with a five-day treatment, and bacteriuria was eradicated in most of the patients (92.7%).

Acute pyelonephritis can be described as the acute, bacterial infection of the kidney presenting with tremor, fever and mostly flank pain.²⁶ It has been reported that acute pyelonephritis develops in 1-2% of pregnancies, and presence of previous asymptomatic bacteriuria or any renal disease increases the risk for development of pyelonephritis, and also possibility to develop acute pyelonephritis is reduced at less than 5% in case pregnant women with asymptomatic bacteriuria are treated.²⁷ In our population, the frequency of acute pyelonephritis was 3.77% in the group with asymptomatic bacteriuria and 2.13% in the group without asymptomatic bacteriuria, and no significant difference was found between the two groups. The reason for higher acute pyelonephritis rate in spite of timely treatment of asymptomatic bacteriuria may be higher non-attendance rates of patients for post-treatment controls and perhaps insufficient compliance with the therapy. But, it is difficult to interpret because of restricted number of cases. Nearly one third of the cases with acute pyelonephritis included in the study had preterm delivery, low birthweight and anemia. Hill et al.⁹ reported 8% preterm delivery, 7% low birthweight and 23% anemia in their population. Our rates for preterm delivery and low birthweight were slightly higher. However, the rate for preterm delivery was only 3% in the Hill et al. study while our rate was 16.6%. Furthermore, the rate of hypertensive

pregnant women was 13.3%. Therefore, higher rates of preterm delivery and low birthweight in our group of 30 patients may not be associated with the presentation of acute pyelonephritis, but with the nature of the patient population carrying a risk for preterm delivery. We followed up the patients diagnosed with acute pyelonephritis at mean 4.5 days as inpatients, and treated them with cephalosporin group of antibiotics for 4 days, and none of the patients developed more severe maternal complications such as respiratory failure, renal failure or sepsis. Such severe complications had been reported in very high rates (21%) at the beginning of 1980s,²⁸ but they were highly reduced along with improvement in the monitoring and treatment facilities in recent years.

Conclusion

Urinary tract infection in pregnancy is a very frequent medical problem, and if untreated on time or inefficiently treated it may lead to severe maternal and fetal complications. Therefore, all pregnant women should be screened at least once by urine culture for asymptomatic bacteriuria throughout their antenatal controls, during early pregnancy, if possible, and when the result is positive, they should be treated by oral antibiotics for a period of 3-7 days. Those women should also be followed-up for recurrent infection after the treatment by means of periodic culture processing. And pregnant women who were diagnosed with acute pyelonephritis must be treated aggressively as inpatients, and appropriate, parenteral antibiotics should be selected for treatment.

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A Case of Tricuspid Atresia: Prenatal Diagnosis and Postnatal Evaluation

Melih Atahan Güven¹, Serdar Ceylaner², Bülent Celasun³, A. Hakan Beyazıt⁴, Numan Aydemir⁵

¹Department of Gynecology and Obstetrics, Kahramanmaraş Sütçüimam University, Kahramanmaraş

²Genetik Center, Zekai Tabir Burak Training and Research Hospital, Ankara

³Department of Pathology, Gülbana Military School of Medicine, Ankara

⁴Department of Gynecology and Obstetrics, Kahramanmaraş State Hospital, Kahramanmaraş

⁵Siyami Ersek Thoracic, Cardiac and Vascular Surgery, Istanbul

Abstract

Background: In this case report, we aimed to discuss prenatal diagnosis and postnatal evaluation of tricuspid atresia is a cyanotic form of congenital cardiac defect in which there is not a direct connection between the right atrium and the right ventricle.

Case: A 25-year-old pregnant woman, G2 P1, in 28th gestational week was referred to our clinic with an abnormal four-chamber-view of the fetus, additionally with a suspected VSD. Fetal echocardiography revealed situs solitus, tricuspid atresia and ventriculo-arterial concordance. A large VSD was present between the left ventricle and the rudimentary right ventricle. A decision of cordocentesis was taken by parents after giving genetic counselling. A normal karyotype, 46 XY, was obtained. Later on, parents made up their decision as termination of pregnancy due to the possible surgical complications and difficulties of palliative surgical interventions. Postmortem examination was performed and a normal situated heart, tricuspid atresia, VSD, rudimentary right ventricle, pulmonary stenosis was detected.

Conclusion: The diagnosis of tricuspid atresia is feasible with fetal echocardiography. A cooperative evaluation should be made by an obstetrician, a thoracic-cardiac surgeon and a specialist in genetics and counselling should be also given to the parents by this team.

Keywords: Tricuspid atresia, fetal echocardiography, gebelik.

Triküspid atrezili bir olgu: prenatal tanı ve postnatal değerlendirme

Amaç: Bu olgu sunumunda, konjenital kalp hastalıklarının siyanotik bir formu olan ve sağ atrium, ventrikül arasında doğrudan bir bağlantı olmaması sonucu ortaya çıkan triküspid atrezisinin prenatal tanısı ve postnatal değerlendirilmesi tartışılmıştır.

Olgu: Yirmibeş yaşında, G2 P1, 28.gebelik haftasında olan ve fetüsta anormal dört kadran görüntüsüne ek olarak ventrikülo-septal defekt (VSD) şüphesi ile sevk edilen hastanın yapılan fetal ekokardiografisinde; situs solitus, sağ atrium ile sağ ventrikül arasında bağlantıyı sağlayan triküspid kapağının yokluğu (tek perfore mitral kapak varlığı) ve konkordant ventrikülo-arterial iletinin olduğu gözlemlendi. Rudimenter sağ ventrikül ve normal morfolojide olan sol ventrikül arasında büyük bir VSD mevcuttu. Aile genetik danışma sonrası kordosenteze karar verdi. Karyotip 46, XY olarak tespit edildi. Karyotip tayinini takiben, aile postnatal operasyonları ve olası komplikasyonları düşünerek terminasyona karar verdi. Fetüse yapılan postmortem muayenede; normal anatomik pozisyonunda yerleşmiş kalp, triküspid atrezisi, VSD, rudimenter sağ ventrikül ve pulmoner stenoz tespit edildi.

Sonuç: Triküspid atrezinin fetal ekokardiografi ile doğum öncesi tanısı mümkündür. Bu olgular kadın doğum, genetik, göğüs kalp damar cerrahisi gibi alanlardan seçilmiş uzmanlardan oluşan bir ekip tarafından değerlendirilmeli ve aileye danışmanlık da bu ekip tarafından verilmelidir.

Anahtar Sözcükler: Triküspid atrezisi, fetal ekokardiografi, gebelik.

Background

Cardiac anomalies occur in 0.4 to 1.1% of live neonates, and they comprise the most common anomaly group.^{1,2} Tricuspid atresia is a cyanotic form of the congenital heart diseases, and its clinical presentation is a result of the absence of a direct connection between the right atrium and the right ventricle. Its incidence is between 1% and 2.5% among infants with congenital heart diseases.^{3,4} Almost all of the cases with tricuspid atresia has ventricular septal defect (VSD), frequently accompanied with rudimentary right ventricle and pulmonary stenosis. Additionally, 80% of the cases with tricuspid atresia have concordant ventriculoarterial connection, 5 while 20% have discordant connection (transposition).⁶

Prognosis is worse in the infants born with tricuspid atresia if it is not managed palliatively. Usually the infants undergo 2 to 3 procedures (Glen and Fontan operations) within the first six years following the labor. The mean survival rate is 50% at the end of 15 years following the procedure.⁷

Case

A twentyfive-year-old pregnant woman, G2 P1, at gestational week 28 who was monitored for a suspected VSD in addition to the abnormal four-chamber-view of the fetus was referred to the Obstetrics and Gynecology Department of the Medical Faculty of Kahramanmaraş Sütçü İmam University for fetal echocardiography. In a sequential analysis of the heart,⁵ presence of situs solitus, lack of formation of the tricuspid valve connecting the right atrium with the right ventricle (presence of a single perforated mitral valve) and concordant ventriculo-arterial connection were observed. A large VSD was present between the rudimentary right ventricle and left ventricle, which was in normal morphology (Figure 1). No anomaly other than cardiac was observed during the systemic examination by ultrasonography. The parents made their choice for cordosynthesis upon genetic consultation. Cariotype was found 46, XY. Following that, the parents decided for the termination of pregnancy considering the postnatal operations and potential complications. A postmortem examinati-

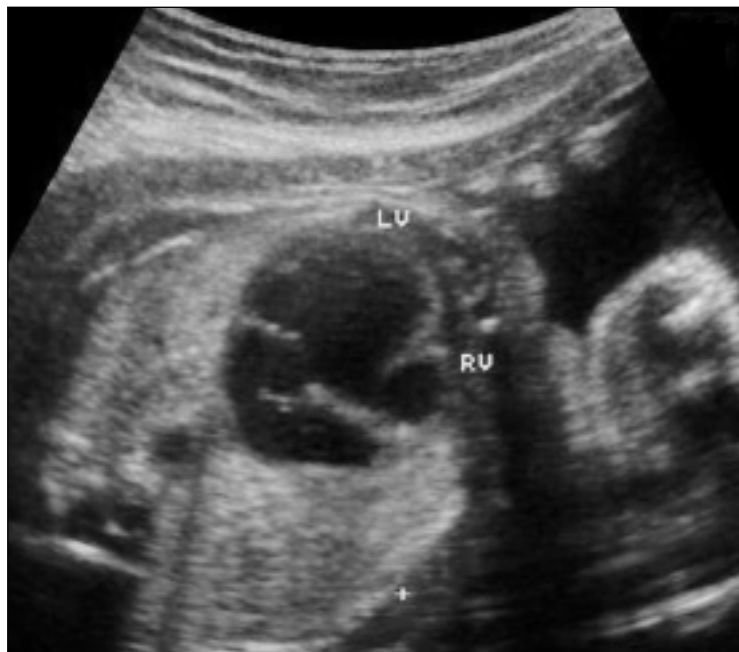


Figure 1. View of tricuspid atresia, rudimentary right ventricle, ventricular septal defect and abnormal four-chamber.

on on fetus revealed a normal anatomic position of the heart, tricuspid atresia, VSD, rudimentary right ventricle and pulmonary stenosis.

Discussion

Diagnosis of tricuspid valve anomalies is made by a standard four-chamber-view, however fetal echocardiography is required for final diagnosis. Tricuspid atresia is a cardiac anomaly which is a rare condition among other cardiac anomalies, and doesn't provide promising results in spite of the procedures where the heart is operated into a single ventricular structure anatomically during the postnatal period.^{3,4,7} Contrary to other cardiac anomalies, it is very rare that tricuspid atresia is accompanied with chromosomal disorders and multiple malformation syndromes, but chromosomal evaluation should also be undertaken.⁸ Incidence of concomitant non-cardiac malformations is around 10%.

No additional anomaly was observed during the prenatal ultrasonographic and postnatal evaluations in our case. In prenatal diagnosis, advanced ultrasonography (particularly facial, renal and gastrointestinal systems), fetal cariotype, family history of cardiac arrhythmia, history of congenital cardiac anomaly and history of lithium intake during pregnancy should be evaluated.⁸ As a result of these evaluations, no etiology was found in our case to understand the cardiac anomaly. In differential diagnosis, pulmonary atresia accompanied with intact septum should be evaluated. Monitoring of the tricuspid regurgitation is helpful in differential diagnosis in such cases. Another diagnosis that should be considered is Double-Inlet ventricle. The family should be informed about the risk for a recurrence rate of appr. 1% in

subsequent pregnancies during the genetic consultation.⁸

Conclusion

Prenatal diagnosis of tricuspid atresia can be made by fetal echocardiography. Such cases should be evaluated by a team of experts from fields such as obstetrics, genetic, and cardiovascular surgery, and counselling should be provided by that team.

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An Ovarian Pregnancy with Delivery of a Live Infant

Banu Dane¹, Cem Dane¹, Murat Yayla¹, Ahmet Çetin¹, Salih Dural¹, Ahmet Tarlacı²

¹Clinics of Gynecology and Obstetrics, Haseki Training and Research Hospital, İstanbul

²Department of Pathology, Haseki Training and Research Hospital, İstanbul

Abstract

Ovarian ectopic pregnancy occurs very rarely. Most of them are terminated before reaching viability. Failed termination at early pregnancy, and repeated failed labor induction especially if the fetus has an abnormal lie or an abnormal presentation are the most important signs. By our case the findings at ultrasonography were like an abdominal pregnancy at 32 weeks' gestation. At laparotomy the diagnosis of ovarian pregnancy was made and a live female infant, weighing 1400g was delivered. After salpingoophorectomy, the patient made an uneventful recovery.

Keywords: Ovarian pregnancy, laparotomy, ultrasonography, abdominal pregnancy.

Canlı doğumla sonuçlanan over gebeliği

Ovaryen ektopik gebelik oldukça nadirdir. Bu gebeliklerin çoğu viabilite sınırına gelmeden sonlandırılmaktadır. Erken gebelikte başarısız sonlandırma, ve özellikle prezentasyon anomalisi olan vakalarda tekrarlayan başarısız doğum indüksiyonu en önemli bulgulardır. Bizim vakamızda ultrasonografi bulguları 32 haftalık abdominal gebelik ile uyumlu idi. Laparotomi sırasında overyen gebelik tanısı koyuldu ve 1400 g ağırlığında canlı, kız bebek doğurtuldu. Hastamız, salpingooforektomi sonrası sorunsuz bir post-operatif dönem geçirmiştir.

Anahtar Sözcükler: Over gebeliği, laparotomi, ultrasonografi, abdominal gebelik.

Background

The reported incidence of ovarian ectopic pregnancy is only 1:7000-40,000 deliveries, and in 0.7% or 0.4% of ectopic pregnancies. Approximately 75% are terminated in the first trimester; 12.5%, in the second trimester; 12.5%, in the third trimester.¹ Nicholls, in 1941, stated that 38 ovarian pregnancies have been recorded to reach the age of viability with 12 living babies and 22 living mothers.² In the 32 years since this report, a search of the world literature has revealed 10 cases that have

been reported as examples of ovarian pregnancy reaching viability.³ In 1982 and 1991 two more cases were reported.^{4,5} This case report describes the clinical and sonographic pattern of an advanced ovarian pregnancy with the aim of emphasizing the most important features.

Case

N.K., a 22-year-old woman, para 1, gravida 2, admitted to the hospital at 32 weeks' gestation, with some abdominal discomfort. She mentioned

of a failed termination at 8 weeks of gestation and has never used an intrauterine contraceptive device. Abdominal examination revealed an oblique lie. Fetal heart tones were 135 bpm and regular. On vaginal examination, the cervix was thick and closed; the presenting part was high.

The findings at ultrasonography were: a 32 weeks fetus separate from the uterus, an ectopic placenta, oligohydramnios and amniotic bands (Figure 1). The first diagnosis was abdominal pregnancy and we decided to terminate the pregnancy because of signs of the acute abdomen.

The abdomen was entered through a midline incision. At laparotomy, the uterus was approximately 12 weeks' size. The amniotic sac containing the fetus and placenta occupied the position of the right ovary; it was adherent to the lateral pelvic wall and attached to the uterus by the utero-ovarian ligament. A diagnosis of an ovarian pregnancy was made. The thin ovarian wall was opened and a female infant, weighing 1400g was delivered. The amniotic fluid was brown colored. The infant had no discernible congenital abnormalities and had Apgar scores of 6, 8, and 9.

By blunt and sharp dissection the amniotic sac and placenta were removed from the lateral pelvic wall. Salpingooforectomy was performed. The penrose drain was placed in posterior cul-de-sac and removed at postoperative second day. The patient had an uneventful recovery and was discharged from the hospital on the seventh postoperative day.

The spontaneous breathing baby was exchange transfused because of hyperbilirubinemia and followed up at an intensive care unite.

The surgical specimen measured 28x17x5 cm, had a bright surface and a vasculated surface with umbilical cord. The placenta had two parts. Sections of umbilical cord were unremarkable. The tube was intact and distinctly separate from the ovary. Chorionic villi with intact ovarian stroma are demonstrated on microscopic specimens (Figure 2). Diagnosis was placenta, with ovarian tissue and ovarian pregnancy.

Discussion

Primary ovarian pregnancy is very rare. This rare ectopic pregnancy is difficult to diagnose prior to surgery. Earlier diagnosis is now possible,

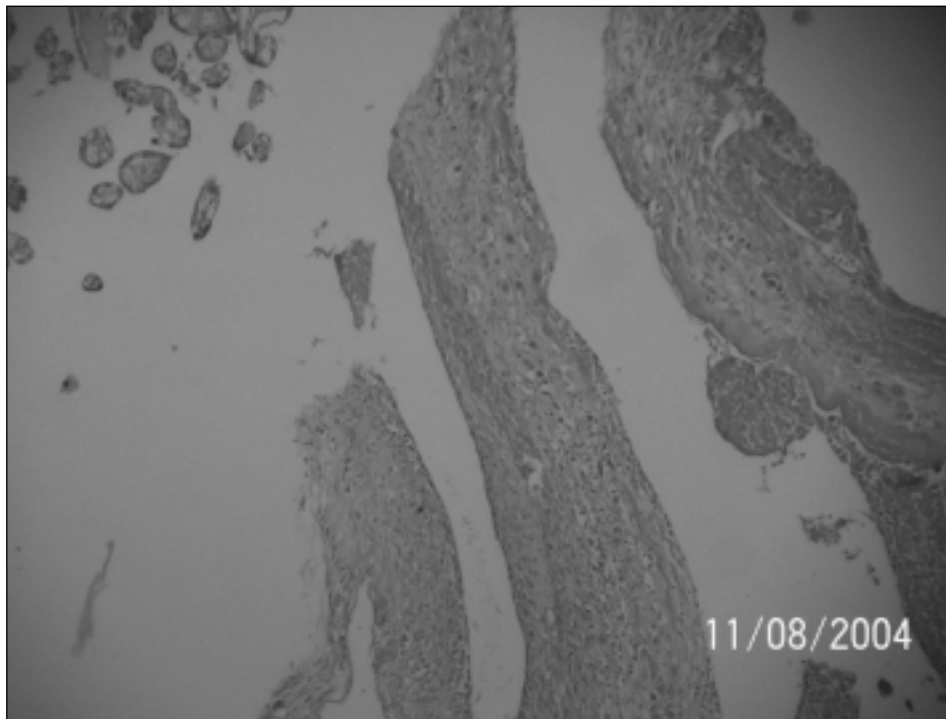


Figure 1. Microscopic section of ovarian tissue and chorionic villi.



Figure 2. On abdominal ultrasonography, the uterus (U) is separate from the placenta (P) and the fetus.

owing to the availability of highly specific radioimmunoassay for human chorionic gonadotrophin and the development of transvaginal ultrasonography. At the beginning of pregnancy, ovarian pregnancies are usually considered as tubal pregnancies, the advanced cases are diagnosed as abdominal pregnancies.

Spiegelberg outlined four criteria for the diagnosis of primary ovarian gestation:⁶ 1. The fallopian tube with its fimbriae should be intact and separate from the ovary, 2. Gestational sac should occupy the normal position of the ovary, 3. The gestational sac should be connected to the uterus by the uterine ovarian ligament; and 4. Ovarian tissue must be present in the specimen attached to the gestational sac. The Spiegelberg criteria were met in this case.

By first trimester pregnancy terminations like in our case, one must insure that tissue obtained at suction curettage is evaluated thoroughly. If pathologic study of the endometrial tissue reveals no chorionic villi, additional diagnostic evaluation is required.⁷

In cases of repeated failed labor induction especially if the fetus has an abnormal lie or an abnormal presentation, the possibility of abdominal pregnancy should be kept in mind.

To the practicing physician, it is of greater importance to reach a decision regarding the necessity for laparotomy than to attempt distin-

guishing preoperatively between forms of ectopic pregnancy.

Ovarian pregnancy must be distinguished from primary peritoneal implantation, which can involve any intraperitoneal site with different problems of diagnosis and management related to the organs involved. The ovary has no peritoneal covering and the implantation within the ovary results in a predictable sequence of events because of the consistent vascular anatomy of the ovary.

The management is laparotomy. Hysterectomy is justified when the ovary cannot be removed alone, when there is other pathology or for sterilization.

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