

ISSN 1300-5251

PERINATAL JOURNAL

Volume 15 / Issue 1 / April 2007



The Official Publication of Turkish Perinatology Society



deomed®

PERINATAL JOURNAL

Volume 15 / Issue 1 / April 2007

The Official Publication of Perinatal Medicine Foundation

On behalf of the Perinatal Medicine Foundation: Murat Yayla

Managing Editor: Cihat Şen

www.perinataljournal.com

Editor-in-Chief

Cihat Şen

Associate Editors

Murat Yayla

Advisory Board

Arif Akşit
Figen Aksoy
Tayfun Alper
Hediye Arslan
Oluş Api
Sebahat Atar Gürel
Tahsin Ayanoğlu
Nazif Bağrıaçık
Gökhan Bayhan
Yeşim Baytur
Tugan Beşe
Faruk Bayru
Nur Danişmend
Fuat Demirkıran
Özgür Deren
Melahat Dönmez
Yakup Erata
Ali Ergün

Kubilay Ertan
Eflatun Gökşin
Arif Güngören
Bilgin Gürateş
Melih Güven
Ümit S. Inceboz
Ayşe Kafkaslı
Ömer Kandemir
Hakan Kani
Ömer Kilavuz
Selahattin Kumru
Nilgün Kültürsay
Rıza Madazlı
Ercüment Müngen
İnanç Mendilcioğlu
Engin Oral
Lütfü Önderoğlu
Soner Öner

Semih Özeren
Okan Özkaya
Yıldız Perk
Haluk Sayman
Yunus Söylet
Mekin Sezik
Turgay Şener
Zeki Taner
Mete Tanır
Alper Tanrıverdi
Ebru Tarım
Aydın Tekay
Başar Tekin
Neslihan Tekin
Beyhan Tüysüz
Seyfettin Uludağ
Ahmet Yalınkaya
Murat Yurdakök

Published four times a year • Publication local periodical

Correspondence: Rumeli Caddesi 47/606, Nişantaşı 34371 İstanbul

Phone: (0212) 224 68 49 • **Fax:** (0212) 296 01 50

e-mail: editor@perinataldergi.com

www.perinataljournal.com

Instructions for the Authors

Coverage

The manuscripts should be prepared for one of the following article categories which are peer-reviewed:

- Clinical Research Article
- Experimental Study
- Case Report
- Technical Note
- Letter to the Editor

In addition, the journal includes article categories which do not require a peer review process but are prepared by the Editorial Board or consist of invited articles, titled as:

- Editorial
- Viewpoint Article
- Review Article
- Abstracts
- Announcements
- Erratum

Manuscript Evaluation

All submissions to Perinatal Journal must be original, unpublished, and not under the review of any other publication. This is recorded by the system automatically with the IP number, the date and time of submission. On behalf of all authors the corresponding author should state that all authors are responsible for the manuscripts. The name, date, and place of the relevant meeting should be stated if the submission is a work that was previously presented in a scientific meeting.

Following the initial review, manuscripts which have been accepted for consideration are reviewed by at least two reviewers. The Editors of the journal decide to accept or reject the manuscript considering the comments of the reviewers. They are authorized to reject or revise the manuscript, to suggest required corrections and changes upon the comments and suggestions of reviewers, and/or to correct or condense the text by permission of the corresponding author. They have also the right to reject a manuscript after authors' revision. Author(s) should provide additional relevant data, documents, or information upon the editorial request if necessary.

Ethical Issues

All manuscripts presenting data obtained from studies involving human subjects must include a statement that the written informed consent of the participants was obtained and that the study was approved by an institutional ethics board or an equivalent body. This institutional approval should be submitted with the manuscript. Authors of case reports must submit the written informed consent of the subject(s) of the report or of the patient's legal representatives for the publication of the manuscript. All studies should be carried out in accordance with the World Medical Association Declaration of Helsinki, covering the latest revision date. Patient confidentiality must be protected according to the universally accepted guidelines and rules. Manuscripts reporting the results of experimental studies on animals must include a statement that the study protocol was approved by the animal ethics committee of the institution and that the study was conducted in accordance with the internationally accepted guidelines, including the Universal Declaration of Animal Rights, European Convention for the Protection of Vertebrate Animals Used for Experimental and Other Scientific Purposes, Principles of Laboratory Animal Science, and the Handbook for the Care and Utilization of Laboratory Animals. The authors are strongly requested to send the approval of the ethics committee together with the manuscript. In addition, manuscripts on human and animal studies should describe procedures indicating the steps taken to eliminate pain and suffering.

The authors should also disclose all issues concerning financial relationship, conflict of interest, and competing interest that may potentially influence the results of the research or scientific judgment. All financial contributions or sponsorship, financial relations, and areas of conflict of interest

should be clearly explained in the cover letter to the Editor-in-Chief at the time of submission, with full assurance that any related document will be submitted to the journal when requested. For the details of journal's "Conflict of Interest Policy" please read the PDF document which includes "Conflicts of Interest Disclosure Statement".

Perinatal Journal follows the ethics flowcharts developed by the Committee on Publication Ethics (COPE) for dealing with cases of possible scientific misconduct and breach of publication ethics. For detailed information please visit www.publicationethics.org.

Manuscript Preparation

In addition to the rules listed below, manuscripts to be published in Perinatal Journal should be in compliance with the Uniform Requirements for Manuscripts Submitted to Biomedical Journals published by International Committee of Medical Journal Editors (ICMJE) of which latest version is available at www.icmje.org.

Authors are requested to ensure that their manuscript follows the appropriate guidelines such as CONSORT for randomized controlled trials, STROBE for observational studies, STARD for diagnostic accuracy studies, and PRISMA for systematic reviews and meta-analyses, for the study design and reporting if applicable.

Authorship and Length of Texts

The author(s) must declare that they were involved in at least 3 of the 5 stages of the study stated in the "Acknowledgement of Authorship and Transfer of Copyright Agreement" as "designing the study", "collecting the data", "analyzing the data", "writing the manuscript" and "confirming the accuracy of the data and the analyses". Those who do not fulfill this prerequisite should not be stated as an author.

Original research articles base on clinical or experimental studies. The main text should not exceed 2500 words (max. 16 pages) and there should be a maximum 6 authors

Case reports should illustrate interesting cases including their treatment options. The main text should not exceed 2000 words (max. 8 pages) and there should be a maximum 5 authors.

Viewpoint articles: Only by invitation and should be no more than 2000 words long (max. 8 pages).

Review articles: Only by invitation and should be no more than 4000-5000 words long (max. 20 pages).

Technical notes aims to present a newly diagnostic or therapeutic method. They should not exceed 2000 words (max. 8 pages) and include a maximum of 10 references.

Letters to the Editor should be no more than 500 words long (max. 2 pages) and include a maximum of 10 references.

Sections in the Manuscripts

Manuscripts should be designed in the following order: title page, abstract, main text, references, and tables, with each typeset on a separate page:

Page 1 - Title page

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)

Last Page - Appendices (patient forms, surveys etc.)

Title page

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.

Abstract page

Abstracts should not contain any abbreviation and references. They should be prepared under following designs.

— **Abstracts of research articles** should be max. 250 words and structured in four paragraphs using the following subtitles: Objective, Methods, Results, and Conclusion. Following the abstract, each abstract page should include max. 5 key words separated with comma and written in lower cases.

— Abstracts of **case reports** should be max. 125 words and structured in three paragraphs using the following subtitles: Objective, Case, Conclusion. Following the abstract, each abstract page should include max. 3 key words separated with comma and written in lower cases.

— Abstracts of **review articles** should be max. 300 words and presented not structured in one paragraph. Following the abstract, each abstract page should include max. 5 key words separated with comma and written in lower cases.

— Abstracts of technical **notes should** be max. 125 words and structured in three paragraphs using the following subtitles: Objective, Technique, Conclusion. Following the abstract, each abstract page should include max. 3 key words separated with comma and written in lower cases.

Main text:

The sections in main text are defined according to the manuscript type.

— In **research articles**, main text should consist of sections titled as "Introduction, Methods, Results, Discussion and Conclusion". Each title may have subtitles. The categories of subtitles should be clearly defined.

The Introduction section should include a brief summary of the base of the work and clearly states the purpose of the study.

The Methods section should contain a detailed description of the material, the study design and clinical and laboratory tests, and statistical methods used. A statement regarding the ethical issues should also be given in this section.

The Results section should provide the main findings of the study. Data should be concisely presented, preferably in tables or graphs.

The Discussion section should mainly rely on the results derived from the study, with relevant citations from the most recent literature.

The Conclusion section should briefly and clearly present the conclusions derived from the results of the study. It should be in compliance with the aim of the work and and point out its application in clinical practice.

— In **Case Reports**, main text should be divided with the titles "Introduction, Case(s), Discussion". Reported case(s) should be introduced clearly including the case story, and the results of laboratory tests should be given in table format as far as possible.

— The text of the **reviews articles** should follow the "Introduction" and be organized under subtitles which should clearly define the text's context categorization. The Reviews are expected to include wide surveying of literature and reflect the author's personal experiences as far as possible.

— The text of the **technical note** type of articles should be divided into "Introduction, Technic, Discussion". The presented technic should be defined briefly under the related title, and include illustrations or figures as soon as possible.

— **Letters to the Editor** should not have titled sections. If there is a citation about a formerly published article within the text, reference(s) should be provided.

References

References used in the text should be directly related to the topic, as recent as possible and in enough numbers. They should be numbered in square brackets in the order in which they are mentioned in the text including Tables and Figures. Citation order should be checked carefully.

Only published articles or articles in press can be used in references. Unpublished data including conference papers or personal communications should not be used. Papers published in only electronic journals or in the

preprint or online first issues of the electronic versions of conventional periodicals should be absolutely presented with DOI (digital object identifier) numbers.

Journal titles should be abbreviated according to the Index Medicus. All authors if six or fewer should be listed; otherwise, the first six and "et al." should be written.

Direct use of references is strongly recommended and the authors may be asked to provide the first and last pages of certain references. Publication of the manuscript will be suspended until this request is fulfilled by the author(s).

The style and punctuation should follow the formats outlined below:

— **Standard journal article:** Hammerman C, Bin-Nun A, Kaplan M. Managing the patent ductus arteriosus in the premature neonate: a new look at what we thought we knew. *Semin Perinatol* 2012;36:130-8.

— **Article published in an only electronic journal:** Lee J, Romero R, Xu Y, Kim JS, Topping V, Yoo W, et al. A signature of maternal anti-fetal rejection in spontaneous preterm birth: chronic chorioamnionitis, anti-human leukocyte antigen antibodies, and C4d. *PLoS ONE* 2011;6:e16806. doi:10.1371/journal.pone.0011846.

— **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.

Figures and tables

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.

Submission

For a swift peer review, Perinatal Journal operates a web-based submission, peer review and manuscript tracking system. Authors are required to submit their articles online. Details of how to submit online can be found at www.perinataljournal.com.

Submission Checklist

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)
8. Figures and tables (numbering; legends and headings; copyright info/permission)
9. Cover letter
10. Acknowledgement of Authorship and Transfer of Copyright Agreement (undersigned by all authors)
11. Conflicts of Interest Disclosure Statement (if necessary)

Perinatal Journal

Volume 15 / Issue 1 / April 2007

Contents

Review	The Role of Neonatal Nurses in Initiating the Mother-Infant Relationship in Premature Infants	1
	Ayşegül İşler	
Research Articles	The Opinion of Health Workers Regarding Vaginal Labor and Cesarean Section	7
	Zeynep Duman, Güleğül Nadirgil Köken, Figen Kır Şahin, Emine Coşar, Dağistan Tolga Arıöz, İlknur Aral	
	Determination of the Median Levels of Triple Test Screening Parameters in Our Region	12
	Nalan Akalın, Serap Arıkan	
	The Role of Ultrasound in Early Pregnancy in Prediction of Miscarriages	20
	Ahmet Jakal, Hüsnü Görgeç, Banu Dane, Cem Dane, Ahmet Çetin, Murat Yayla	
	The Role of the Bishop Score for Successful Labor Induction	26
	Alpaslan Akyol, Özcan Karademir, Ali Gedikbaşı, H. Cemal Ark, Ahmet Gülek	
Case Report	Aplastic Anemia and Pregnancy: Case Report	35
	Ercan Yılmaz, Ümit Korucuoğlu, Arzu Acar, Nuray Bozkurt, Aydan Biri	
	Celiac Disease and Pregnancy: A Case Report	39
	Tuncay Nas, Ercan Yılmaz, Ümit Korucuoğlu, Pınar Keskin Özcan, Aylar Poyraz, Rifat Gürsoy	
	A Case of Left Isomerism with Hydrops Fetalis: A Case Report	42
	İncim Bezircioğlu, Mine Tunakan, Ali Baloğlu, Burcu Çetinkaya, Merve Biçer	
	Congenital pulmonary airway malformation: Case report	47
	Nihal Kılınc, Abdurrahman Önen, Murat Yayla	

REVIEW

The Role of Neonatal Nurses in Initiating the Mother-Infant Relationship in Premature Infants

Ayşegül İşler

Ege Üniversitesi, Çocuk Sağlığı ve Hastalıkları Hemşireliği, Bornova, İzmir

Abstract

Mother-infant relationship bears a crucial significance on emotional and physical development of the infant, especially in the development of a feeling of confidence in later years. The relationship is affected negatively by the disappointments about the infant's condition and by its transfer to the intensive care unit for serious health problems. Neonatal nurses occupy a unique position among other health professionals in initiating a positive relationship between the mother and the infant with their professional knowledge, experience and observations.

Keywords: Mother infant relationship, mother, premature infant, neonatal nurses.

Prematüre bebeklerde anne-bebek ilişkisinin başlatılmasında yenidoğan hemşirelerinin rolü

Anne-bebek ilişkisinin erken dönemde başlatılması, bebeğin ruhsal ve fiziksel gelişimi ve çocuğun yaşının ileriki dönemlerinde güven duygusunun kazandırılması için oldukça önemlidir. Prematüre bebeklerde, bebeğin hayal edilenden farklı olması ve bazı sağlık sorunlarının bulunması nedeniyle yoğun bakım ünitesine transfer edilmesi sonucu anne-bebek ilişkisi olumsuz yönde etkilenmektedir. Yenidoğan hemşireleri, yenidoğanlar konusundaki bilgi, gözlem ve deneyimleriyle sağlık ekibi içinde prematüre bebeği olan annelerde, anne-bebek ilişkisinin olumlu yönde başlatılmasında eşsiz bir konuma sahiptirler.

Anahtar Sözcükler: Anne-bebek ilişkisi, anne, prematüre bebek, yenidoğan hemşireleri.

Introduction

Having a baby is one of the momentous events in people's lives, and parents, without exception, dream of having a normal and healthy baby.^{1,3} The mother-infant relationship is based on mothers' first impression of the infant during the first days of neonatal period.^{3,4} Maternal commitment has been regarded as a process of building up an affective connection between the mother and the infant along with a satisfying and emotionally gratifying interaction.³ An infant's commitment and affection to

its mother has proved to be one of the fundamental factors in providing a normal and healthy growth affecting their life quality positively.³

Prematurity, on the other hand, influences maternal commitment adversely.³ It has been often reported that mothers who have their baby prematurely experience high levels of psychosocial stress.^{3,5,6} Mothers may feel a sense of failure or insecurity because of having an unhealthy baby and even reject an interaction with their baby. That mothers of premature

babies fail to maintain their self-confidence and become dissatisfied may cause a delay in commitment and a negative perception on behalf of the infant.^{3,5} Studies have shown that mothers with premature babies see, touch and embrace their babies later than usual and thus have difficulties in being accustomed to having a premature baby, which, eventually, affects mother-infant relationship negatively.^{5,6}

Factors in providing intimacy between the mother and the infant in early neonatal period

These are rooming in, skin to skin care, eye contact, embracing, breastfeeding and participation in baby care.^{2,7}

Rooming-in: Mothers and babies shouldn't be separated after a normal birth. The baby may be placed in a cradle by the mother, which is called "rooming in", and which marks the beginning of mothers' responsibilities. Rooming-in is considered as a significant opportunity for enabling the mother to breast-feed her baby whenever she wants. The baby can be given to the mother unless she is severely ill or addicted to alcohol or drugs.^{2,8}

Interruption of rooming-in in the neonatal period for a variety of reasons and separation of the infant from the mother for a long time also affect the mother-infant relationship.⁸ In a study on the significance of rooming-in period, it was reported that while mothers whose babies were given to them naked after birth were observed to make progress in improving skin to skin care, those whose babies were kept in infant incubators could see their babies 12 days after the birth and failed to improve skin care.⁹

Skin to skin (Kangaroo) care: Also called the Kangaroo care, skin to skin care is an indispensable factor in maternal commitment starting right after the birth when mothers are highly vulnerable to stimuli and developing in the early neonatal period.^{10,11}

Kangaroo care between the premature infant and the parents

- starts with a 30 minutes care once a day,
- can be applied two or three hours a day,

- may also be practical in infants who receive oxygen therapy and nasal CPAP (Continuous Positive Airway Pressure)
- can be integrated into hospital care^{10,11}

These initiatives:

- provide a feeling of fulfillment of pregnancy for the mothers
- helps an earlier transition to natural parental roles
- have an influence on maintaining the heat balance of the premature infant
- reduce apnea and periodic breathing
- palliate the adverse effects of the intensive car on babies
- facilitates early discharge of the newborn infants^{10,11}

Embracing: Skin to skin care phase is followed by embracing when mothers can comfortably hold their babies and want a closer skin contact, which is usually regarded as a sign of love and affection.^{2,12} Most of the mothers hold their babies at breast level on the left hand side so they can hear their mothers' heartbeat and feel secure. It has been also reported that although infants are expected to develop hypothermia when placed naked on their mothers' breast, the body temperature decreases by only about 0.1 centigrade even without a heating lamp.^{1,2}

Eye Contact: Seeing their baby for the first time after birth, mothers try to communicate with their babies in order to encourage them to open their eyes by whispering and talking like "open your eyes", "what color are its eyes?" or "It is looking at me". When the mother manages to make eye contact with her baby, she feels intimate and confident. This, in turn, pleases the baby and starts a substantive relationship between both sides. Eye contact has been also observed between premature infants and their mothers as well and considered to be the beginning of motherhood.^{1,2}

Breastfeeding: Breastfeeding assures a strong mother-infant commitment and reinforces a loving and affectionate relationship. A mother who attentively starts breastfeeding ensures a feeling of confidence for her baby, which brings about a feeling of warmth both

biologically and emotionally. Breastfeeding mothers are believed to be more affectionate and yet less complaining about caring and feeding the baby.^{8,12}

Maternal behaviors that have adverse affects on mother infant relationship

- Dissatisfaction with the birth experience / Ignoring or neglecting the infant
- Perceiving the infant as ugly / Feeling of hate towards the infant
- Annoyance for the voices that the infant produces,
- Feeling of nausea about the baby's vomit / Cleaning up its excretion with anger
- Holding the infant away from her body in an uncomfortable position or refusing to hold the infant
- Avoiding touching, caressing or making eye contact with the infant
- Not talking to the infant or thinking that the infant doesn't love her.
- Insisting that the infant has a health problem although no confirming symptom is found during the tests.
- Claiming that the infant shows no resemblance to parents (one of the most serious negative statements about the infant)
- Considering that the infant doesn't need eye contact, skin to skin contact and positive verbal stimuli.
- Inadequate or excessive feeding, avoiding breastfeeding,
- Leaving the infant alone in the room or in a crowded and noisy place and ignoring the infant.
- Verbal or non-verbal negative behaviors,
- Dissatisfaction with the infant's sex^{2,9}

A healthy infant's emotions may be also influenced adversely in a negative mother-infant relationship.

The problems that may be caused by the negative behaviors of the mothers

- Malnutrition / continuous vomiting / recurrent diarrhea

- Growth Disorder / Constant crying and perturbation
- A lethargic and unhappy outlook / sleeping disorder,
- Staring at a certain point for a long time / a displeasing relationship,
- Minimal verbal production of the infant^{2,9}

The significance of nursing care in initiating the mother/infant relationship in premature infants

A team approach is the most fundamental component of a Neonatal Intensive Care Unit (NICU) where the infant care, treatment and tracking are carried out through a cooperation of a specially trained and experienced health team among whom neonatal care nurses occupy a unique position. They mostly deal with maternal problems such as refraining from touching, caressing or giving care to the infants for the fear of hurting them, or failure in breastfeeding. Spending a great deal of time with the infants when compared to other members of the health team, neonatal care nurses inevitably undertake a more comprehensive responsibility in developing a mother-infant relationship. The most crucial role of the nurse is considered to find out the necessities of the mother about the infant and support them until they can maintain the self-care. In a study conducted with the purpose of assessing the significance of nursing care in initiating the mother-infant relationship, it was observed that there was a statistically meaningful difference between the average monitoring scores of the mothers before and after the education program, which illustrated that education programs for the premature infant care would certainly improve the mother-infant relationship.³

Emphatic Approach: Premature birth or having a baby with certain illnesses or anomalies may cause the family to become emotionally disturbed or develop unexpected reactions. Families of premature infants utilize a variety of coping strategies to overcome such emotional problems. When failed to overcome these problems and maintain a psychological balance, they may even experience emotional breakdowns.^{5,14} Avoiding a crisis and providing a

healthy solution can only be possible so long as the nurse develops an emphatic approach and awareness towards the difficulties of the family allowing and controlling healthy reactions. Nurses, too, may develop feelings of anger, hostility or disappointment if they can't succeed to maintain the psychological balance of the family members, which jeopardizes their assistance to the mothers and the infants.^{5,14,15}

Neonatal nurses should seek the answers for the following questions and design the neonatal care plan for the families of premature infants accordingly.

- How do the family members feel about the premature birth?
- What did it change in relations of the family members?
- How did it affect the emotional conditions of the family members?
- What kind of assistance do the family members need to overcome this problem?^{21,15}

The nurses monitor and evaluate the mother-infant relationship and set a role model for the mother when necessary. It is imperative that the nurses in neonatal units must become accustomed to the infant and therefore examine the infant before showing it to the mother, which helps the nurse to answer the questions better. The nurse should allow the mother to spend some time with her baby and look over it while standing by the mother and answering her questions. During the consultation, the nurse should inform the parents about the birth characteristics, personal and unique characteristics of the infant and explain about the hearing and seeing reflexes. If the infant has an anomaly (like the cleft palate), the mother's attention will be focused on this anomaly unavoidably. However, the nurse's duty is to distract her attention away from the anomaly and focus on the positive characteristics of the infant like "its eyes are beautiful" or "look how it holds my fingers with its tiny hands", which is expected to help the mother to focalize her attention on the positive attitudes of her baby. A warm, kind and relaxing atmosphere will certainly help. At the end of the consultation, the family of the premature baby should be given an instructive guideline.^{3,15,16}

Providing efficient support for the family on their entrance to the intensive care unit: The mother who is going to visit her baby at the intensive care unit is highly anxious to learn if the infant has any anomalies. She looks at the faces of the health team seeking a clue to learn whether or not the baby is making progress and doesn't feel fully satisfied until seeing her baby.^{1,15}

It is crucially important to communicate with the parents right after the birth and choose the words diligently. Pessimistic evaluations and information must not be uttered instantly, which will be kept in mind after all rather than all other evaluations and instructions. The nurse must maintain her sincerity from the beginning and especially refrain from letting out the statistical data about the life chance of the infant.^{1,2} The infant must be shown to the mother when she feels ready. Nevertheless, it should be remembered that a delayed visit will cause more anxiety for the mother. Therefore, mothers of premature infants shouldn't be kept waiting for a long time and the visit must be arranged at a convenient time for both sides.^{4,7} It has been also noted that the mothers should be allowed to see the infant right after the birth to assure the identity of the infant against which no restrictive rules should be enforced in the unit. It must be kept in mind that family visits (parents and siblings) are allowed during the day in neonatal care units worldwide.^{1,2}

Convincing the family about the significance of skin contact: Certain attitude differences were reported among the mothers of premature infants in a study conducted with the mothers of term and preterm infants. It was also observed in the same study that the mothers of premature infants turned around the incubator and touched the limbs of the infants when they were allowed to see their babies for the first time.¹⁷ Although minimum handling policy is a common procedure in neonatal intensive care units in order to prevent infections, neonatal nurses shouldn't hesitate to touch and caress the infant in accordance with the social touching principle. Parents are also allowed, and even encouraged, to see and touch the infant and instructed about infant care in the meantime.

In a study conducted by Yılmaz (2004) on the significance of the effects of baby massage on premature infants, 20 premature infants were given baby massage for 15 minutes three times a day for ten days in total versus the control group of unmassaged 20 premature infants. With the same amount of nutrition and same kind of food, the massaged infants gained 47% more weight; they comparatively stayed awake for a longer period of time, and they were more agile when compared to the control group. It was also reported that the test group illustrated a more rapid and balanced physical and motor and mental development and they were discharged six days earlier.³ Consequently, baby massage obviously helped both physical and mental development in premature infants.

Ensuring parental participation in the infant care: Neonatal unit nurses should assure a close contact between the mother and the infant immediately and sufficiently. The ideal time for the mother's active participation in the infant care should be decided and her relation with the infant should be evaluated. When the infant's health condition becomes stabilized and convenient for the mother care, the nurse should encourage the mother to participate fully in the infant care so as to relieve her anxieties.¹⁸ It was proved in related studies that the mother infant relationship developed better as the mother of the premature baby spent more time in the NICU.^{1,5} The mothers who were accepted to the NICU were observed to develop less negative attitudes towards the infants as they participated more in feeding the baby and changing the diapers and gained much confidence in the premature infant care.^{1,2,5} However, especially primipar mothers may avoid an interaction with the infant and refrain from undertaking the responsibilities of infant care. Therefore it should be kept in mind that these mothers need extra time, attention and support in adjusting themselves to maternal roles.² Neonatal care nurses should highlight the positive developments in the infant's health. If mothers of premature infants, for instance, realize slight weight losses, they should be reminded that gaining weight doesn't always occur gradually upwards and slight losses are considered to be normal, which will certainly mitigate the anxieties of the mothers.¹ The father's par-

ticipation in the infant care will also help to develop empathy between the spouses. The primary responsibility of a neonatal nurse in this phase is to monitor the behaviors of the mother and immediately report if the mother looks dissatisfied with her baby or avoids eye contact or if the father hasn't showed up yet, which necessitates instructive support accordingly.^{2,3} Excessive optimism of the mothers is also regarded harmful as such mothers may not pay much attention to the infant care and neglect instructions occasionally.¹

Assisting to reduce stress: Because the NICU might be considered as unnerving and foreign places, it is highly important to answer all the questions accurately and satisfactorily. Malfunctioning or beeping devices may induce stress for the parents. The intensive care unit nurses should calm down the parents saying that the alarm beeps have nothing to do with their baby and they can see the infant in a few minutes.¹ In a related study, Bell stated that one of the most important problems of the health teams in time of crisis is communication and health professionals who have difficulties in verbal communication may lose connection with the parents of the premature infant.¹⁹ However, a healthy interaction between the nurse and the parents also includes non verbal communication and sometimes saving some time for the mother and her relatives and even a friendly touch would be fairly enough, which will help both sides to overcome the crisis situation.

As a conclusion, initiating a healthy and positive mother/infant relationship between the mother and the premature infant assures a feeling of confidence resulting in a healthy development of personality in later years. The health professionals in the NICU, especially the neonatal care nurses, apparently have great responsibility in accomplishing a healthy relationship between the mother and the premature infant.

References

1. Akansel KN. Prematüre doğum yapmış ailelerin, özellikle annelerin, bebeğe fiziksel ve duygusal yaklaşımlarında hemşirenin eğitici ve destekleyici rolünün önemi. İstanbul Üniversitesi Sağlık Bilimleri Enstitüsü Yüksek Lisans Tezi, 1993.

2. Balcı SA. İlk kez doğum yapan annelerin bebeklerini algılama durumları. İstanbul Üniversitesi Sağlık Bilimleri Enstitüsü Yüksek Lisans Tezi, 1997.
3. İşler A, Görak G. Prematüre bebeği olan annelerde olumlu anne-bebek ilişkisinin başlatılmasında hemşirelik yaklaşımının önemi. *Çocuk Dergisi* 2007; 7: 36-41.
4. Sung MH, Kim MK. A study of the effects of behavior contact in early mother-infant attachment. *Taehan Kanbo Hakboe Chi* 2005; 35: 842-9.
5. Seideman RY. Parent stress and coping in NICU and PICU. *J Pediatr Nurs* 1997; 12: 169-75.
6. Gibbins SM, Chapman JS. Holding on: parents perceptions of premature infants' transfers. *JOGNN* 1996; 25: 147-53.
7. Tilokskulchai F, Phatthanasiriwethin S, Vichitsukon K, Serisathien Y. Attachment behaviors in mothers of premature infants: a descriptive study in Thai mothers. *J Perinat Neonatal Nurs* 2002; 16: 69-83.
8. Brandt KA. Mother-infant interaction and breastfeeding outcome 6 weeks after birth. *JOGNN* 1998; 27: 169-74.
9. Cusson RM, Lee AL. Parenteral interventions and the development of the preterm infant. *JOGNN* 1994; 1: 54-60.
10. Neu M. Parents' perception of skin to skin care with their preterm infants requiring assisted ventilation. *JOGNN* 1999; 157-63.
11. Feldman R, Eidelman AI, Sirota L, Weller A. Comparison of skin-to-skin (kangaroo) and traditional care: parenting outcomes and preterm infant development. *Pediatrics* 2002; 110: 16-26.
12. Conk Z, Başbakkal Z, Kılıç M ve ark. Prenatal dönemde emzirme tekniği konusunda verilen planlı eğitimin, anne sütü ile beslenme üzerine etkisi. Ege Üniversitesi EGEMEM Projesi, 2006.
13. Yılmaz H. Bebek masajının bebeklerde uyku süresine, büyüme-gelişmeye ve annelerde durumluk-sürekli kaygı düzeyine etkisinin incelenmesi. Ege Üniversitesi Sağlık Bilimleri Enstitüsü Doktora Tezi, 2004.
14. Griffin T, Wishba C, Kavanough K. Nursing interventions to reduce stress in parents of hospitalized preterm infants. *J Pediatr Nurs* 1998; 13: 290-4.
15. McKim E. The information and support needs of mothers of premature infants. *J Pediatr Nurs* 1993; 8: 233-43.
16. McCarthy P. The mother-child interaction and clinical judgment during acute pediatric illness. *J Pediatr* 2000; 136: 809-17.
17. Leonard BJ, Scott SA, Erpestad N. Maternal perception of first-born infants. A controlled comparative study of mothers at premature and full-term infants. *J Pediatr Nurs* 1992; 7: 90-95.
18. İşler A, Conk Z. Pediatride aile merkezli bakım. *Ege Pediatri Dergisi* 2006; 13: 187-94.
19. Bell L, St-Cyr Tribble, D Paul, D Long. A concept analysis of parent-infant attachment. *J Adv Nurs* 1998; 28: 1071-81.

The Opinion of Health Workers Regarding Vaginal Labor and Cesarean Section

Zeynep Duman¹, Gülelgül Nadirgil Köken², Figen Kır Şahin², Emine Coşar², Dağistan Tolga Arıöz², İlknur Aral²

¹Serbest, Yüksek Hemşire, Afyonkarabisar

²Afyon Kocatepe Üniversitesi, Kadın Hastalıkları ve Doğum Anabilim Dalı, Afyonkarabisar

Abstract

Objective: The aim of this study is to determine the opinions of the health workers about vaginal labor and cesarean section.

Methods: In May 2006 August 2006, a total of 270 women health workers in Ahmet Necdet Sezer Hospital of Afyon Kocatepe University were interviewed. 250 health workers who accepted to participate were recruited in this study. The study was performed by a questionnaire which has 26 questions about vaginal labor and cesarean section. The questionnaire is formed by five sections and contains questions about sociodemographic status, obstetric status and the delivery status.

Results: According to the results of this study, %46.9 of health workers chose vaginal birth while 53.1% cesarean section. It was found that the main reasons for cesarean section are medical complications (16.3%) and personal choice (76.7%). Women who have no previous delivery experience stated that they prefer vaginal birth with 57.4% and cesarean section with 23.1%, and 19.5% of women was undecided. 74.2% of women with vaginal delivery believe that the vaginal birth is so natural, while 53.8% of women with cesarean section believe the vaginal birth is so painful.

Conclusion: In this study 53.1% of the female health workers who has a birth preferred cesarean section. The first reason to prefer cesarean section was detected as pain. Only 15.8% of the health workers who had vaginal labor, had epidural anesthesia during delivery. We suppose that the cesarean section rates will decrease when the people will be inform about epidural anesthesia.

Keywords: Vaginal birth, cesarean section, health workers.

Sağlık çalışanlarının normal doğum ve sezaryen ile ilgili düşünceleri

Amaç: Çalışma, sağlık çalışanlarının normal doğum ve sezaryen doğum ile ilgili düşüncelerini incelemek amacıyla yapılmıştır.

Yöntem: Araştırmamızda Mayıs 2006 ve Ağustos 2006 tarihleri arasında, Afyon Kocatepe Üniversitesi Ahmet Necdet Sezer Uygulama ve Araştırma Hastanesi'nde çalışan, 250 bayan sağlık personeline, normal doğum ve sezaryen doğum ile ilgili düşüncelerini içeren, 26 sorudan oluşan anket formu uygulanmıştır. Anket formu, 5 bölümden meydana gelmektedir. Formda, sosyodemografik özelliklere ait sorular, obstetrik özelliklere ait sorular, normal ve sezaryen doğum yapanlarla, hiç doğum yapmayanlara ait sorular bulunmaktadır.

Bulgular: Araştırma sonuçlarına göre, doğum yapan sağlık personelinin %46.9'u normal doğumu, %53.1'i sezaryen doğumu tercih etmiştir. Sezaryen olma sebepleri incelendiğinde, kendi isteği ile sezaryen olanların oranı %16.3, tıbbi endikasyon nedeniyle sezaryen olanların oranı %76.7 olarak bulunmuştur. Hiç doğum yapmayan sağlık personelinin doğum tercihleri sorulduğunda %57.4'ü normal doğumu, %23.1'i sezaryen'i tercih ederken, %19.5'i kararsız kalmıştır. Normal doğumu tercih edenlerin %74.2'si normal doğumun doğal olduğunu, sezaryeni tercih edenlerin %53.8'i normal doğumun ağırlı olduğunu düşünmektedir.

Sonuç: Araştırmamızda, doğum yapan sağlık personelinin %53.1'i sezaryen doğumu tercih etmiştir. Sezaryen doğumu seçme nedeni olarak ilk sırada ağrı yer almaktadır. Normal doğum yapan sağlık çalışanlarının sadece %15.8'inin epidural analjezi ile doğumunu gerçekleştirdikleri saptanmıştır. Bu nedenle epidural analjezi ile ilgili bilgiler artırıldığında, sezaryen doğum oranlarının düşeceği kanaatindeyiz.

Anahtar Sözcükler: Normal doğum, sezaryen doğum, sağlık personeli.

Introduction

Today, being a safer procedure has made the cesarean section rate increased.¹ World Health Organization propose that cesarean section rate should be limited at 15%.^{2,3} Brazil has highest cesarean section rates with 36%.⁴ However, like most of the other countries, cesarean rates are over the WHO proposal in our country. According to the Turkey Population Health Study in 2003, cesarean section rate is 21.2% in Turkey.⁵ Later marriage ages of women, later conception ages, desire of lesser number of children, infertility problem, and emergence of “risky baby” and “precious baby” concepts caused increased cesarean rates.⁶ Most of the women decide cesarean section when become pregnant to not feel the delivery pain. Cesarean section is getting more preferred method especially in health workers without any medical indication. The goal of this study was to determine the opinion of health workers regarding vaginal labor and cesarean section.

Methods

In May 2006–August 2006, a total of 270 women health workers in Ahmet Necdet Sezer Hospital of Afyon Kocatepe University were interviewed. 250 health workers, who accepted to participate, were recruited into this descriptive study. The questionnaire which was consisted of five parts with total 26 questions was used in health workers. It was composed of questions about age, educational state, profession, and marital status, delivery, number of delivery, number of child, vaginal delivery, cesarean section, nulliparity, most secure way of delivery, and complications and cost effectiveness of delivery ways. Data were analyzed by SPSS for Windows 13.0. For statistical analysis, Student T test and χ^2 test were used. Statistical significance is quoted at the $P < 0.05$ level.

Results

Mean ages for women at least with one vaginal delivery were 31.38 ± 5.42 ($n=81$) and for women who have no delivery were 25.29 ± 4.25 ($n=169$) in study population. According to the results of this study, 46.9% of health workers chose vaginal delivery (mean age was 32.00 ± 6.35) while 53.1% cesarean section (mean age was 30.84 ± 4.46) ($n=81$). 32.4% of the cases had delivered. 61.7% of the delivered women had one delivery and 25.9% of the cases had delivery twice. 8.6% of the cases ($n=10$) had delivery three times, 2.5% of the cases had delivery four times and 1.2% of the cases had delivery five times. Sociodemographic properties can be seen in Table 1. All women with low educational level (graduated from the primary school) delivered vaginally (100%) and 58.5% of women with high educational level (graduated from university) have chosen cesarean section as presented in Table 2. Rates of cesarean section rose with increased educational. It was determined that most of the teaching staff delivered (68.4%) but most of the nurses (71.7%) and other participants (73.3%) did not delivered as showed in Table 3. In the analysis of the cause of preferring the vaginal delivery, 73.7% of participants stated that it was their personal choice and 18.4% of them stated that doctor’s proposal. 81.6% of participants who delivered vaginally firstly, wanted vaginal delivery again. Causes of preferring the vaginal delivery were less medical complications, breastfeeding and earlier return to daily activities, safety, and naturalness in vaginal delivery, 18.4% of participants who delivered by cesarean section at first delivery, wanted cesarean section at second delivery. These participants stated that vaginal delivery was more painful and with more blood loss. It was determined that epidural analgesia was not done in 84.2% of cases and was done in 15.8% of cases in vaginal delivery. In the

Table 1. The distribution of socio-demographic characteristics.

Educational Status	n	%
Primary school	5	2.0
Secondary school	3	1.2
High school	55	22.0
University	187	74.8
total	250	100
Professional Status	n	%
Prof/Asc Prof	19	7.6
Resident	39	15.6
Nurse	106	42.4
Other	86	34.4
Total	250	100
Marital Status	n	%
Married	112	44.8
Single	138	55.2
Total	250	100

analysis of the cause of preferring the cesarean section it was found that 76.7% of participants stated medical indications, 16.3% of participants stated personal choice. Distribution of the next delivery preference according to first

delivery way was given in Table 4. When asked to participants as which one was the most secure way of delivery, 84.8% of participants answered as vaginal delivery and 15.2% of participants answered as cesarean section. When asked to participants which way of delivery had more complications, 18.5% of participants answered as vaginal delivery and 81.5% of participants answered as cesarean section. 57.6% of subjects said no and 42.4% answered yes to the question if elective cesarean section should be performed without any medical indication. 69.6% of participants answered as yes and 30.4% as no, when they asked if they wanted epidural analgesia for vaginal delivery. Distribution pattern of epidural analgesia request according to educational level during vaginal delivery is given in Table 5. All the participants who graduated from primary school did not want epidural analgesia during labor while 71.7% of participants who graduated from university wanted epidural analgesia during labor.

Table 2. The method of delivery and educational status.

	Metod of Delivery					
	Normal		caesarean		Total	
Educational Status	%	%	%	%	%	%
Primary school	5	100	-	-	5	100
Secondary school	2	100	-	-	2	100
High school	4	44.4	5	55.6	9	100
University	27	41.5	38	58.5	65	100

$\chi^2=8.70$, $p<0.05$ ($p=0.034$).

Table 3. The distribution of occupational status and parity.

	Metod of Delivery					
	Yes		No		Total	
Professional Status	%	%	%	%	%	%
Prof/Asc Prof	13	68.4	6	31.6	19	100
Resident	15	38.5	24	61.5	39	100
Nurse	30	28.3	76	71.7	106	100
Other	23	26.7	63	73.3	86	100

$\chi^2=13.98$, $p<0.01$ ($p=0.003$).

Table 4. The distribution of occupational status and parity.

	Metod of Delivery at Next Pregnancy					
	Normal		Caesarean		Total	
Metod of delivery at first pregnancy	n	%	n	%	n	%
Normal	31	81.6	7	18.4	38	100
Caesarean	3	7	40	93	43	100

$\chi^2=46.10$, $p<0.001$ ($p=0.000$).

Table 5. Demanding epidural anesthesia and educational status.

Educational Status	Metod of Delivery					
	Yes		No		Total	
	%	%	%	%	%	%
Primary school	-	-	5	100.0	5	100.0
Secondary school	2	66.7	1	33.3	3	100.0
High school	38	69.1	17	30.9	55	100.0
University	134	71.7	53	28.3	187	100.0

$\chi^2=11.84$, $p<0.05$ ($p=0.008$).

Discussion

It was determined that when educational level was risen cesarean section rates were risen too and cesarean section rates in delivered health workers were 53.1% in our study. Although there were not sufficient data about cesarean section rates in our country, the frequency of this method reported as increasing significantly in recent years. Most of this increase is constituted by elective (personal choice) cesarean sections.⁷ In one study, elective cesarean section rate was 8.1% in Haseki Hospital.⁸ Canbaz et al.,⁹ reported that %29.2 of health workers preferred elective cesarean section in their study which was compatible with our study. Elective cesarean rate was 16.3% in our study. The main factors that increasing cesarean section rate were principal of “once cesarean and always cesarean” and elective cesareans in socioeconomically developed societies.¹⁰ Women with cesarean delivery have a prevalent custom to prefer cesarean section

again because of the risk of uterus rupture from the scar tissue. However, recent studies showed that 60-80% of women with previous cesarean section can have vaginal delivery.¹¹ In our study, 93% of participants who delivered by cesarean section at first, preferred cesarean section again at second delivery. 18.4% of participants who delivered vaginally at first delivery wanted cesarean section at second delivery. In our study, causes of preferring the cesarean section were medical indication, herself or husband's choice, and fear of the labor pain. In study of Sayın et al.,⁷ causes of cesarean section in health workers were fear of the labor pain, fear of the baby trauma, doctor proposal, and social factors. In Hopkins study,¹² it was determined that most of the women preferred vaginal delivery and found vaginal delivery was superior to cesarean section. In our study, 96% of participants stated that vaginal delivery was so natural and physiological, 81.6% of them think that cesarean section had more complications too.

Conclucion

53.1% of delivered health workers chose cesarean section in our study. First cause of preferring cesarean section was pain. It was found that only 15.8% of health workers who delivered vaginally were done with epidural analgesia. Consequently, we think that when the knowledge about epidural analgesia and the knowledge about delivering vaginally after cesarean section in suitable patients increase, cesarean section rates would decrease.

References

1. Güneş H. Jinekolojik ve Obstetrik Cerrahi. Ankara: Güneş Kitabevi; 2005; 1549-71.
2. Konakçı S., Kılıç B. İzmir'de sezaryen sıklığı ve buna etki eden faktörler. *T Klin Jinekoloj Obst* 2004; 14: 88-95.
3. Yumru E, Davas İ, Baksu B, Altıntaş A, Altın A, Mert M. 1995-1999 Yılları arasında sezaryen operasyonu endikasyonları ve oranları. *Perinatoloji Dergisi* 2000; 8: 94-8.
4. Osis KS, Padua GA, Duarte TR, Souza A. Faundes. The opinion of Brazilian women regarding vaginal labor and cesarean section. *Int J Gynecol Obstet* 2001; 75: 59-66.
5. www.saglik.gov.tr Erişim 28.10.2006.
6. Özgüven T, Evrücke C. Sezaryen In: Beksaç S. (Ed). *Obstetrik Maternal-Fetal Tıp & Perinatoloji*. İstanbul: Nobel Tıp Kitabevleri, 2001; 1322-8.
7. Canbaz S, Sünter T, Süren C ve ark. Kadın sağlık çalışanlarının doğurganlık özellikleri, gebelik ve doğum sonu dönemdeki çalışma koşulları. *Kocatepe Tıp Dergisi* 2005; 6: 39-44.
8. Sayın C, Berberoğlu U, Varol F. Sezaryenle doğum yapmış sağlık personelinde doğum sonrası memnuniyet ve takip edilen gebelikte doğum şekli tercihi. *T Klin Jinekoloj Obst* 2004; 18: 82-8.
9. Hut F. Haseki Eğitim ve Araştırma Hastanesi Kadın Hastalıkları ve Doğum Kliniğinde 2000-2004 Yılları Arasında Sezaryen Oranları. Uzmanlık Tezi, İstanbul, 2005.
10. Cunningham FG, MacDonald PC, Gant NF. Cesarean Delivery and Cesarean Hysterectomy. In: Williams Obstetrics. Connecticut: Appleton Lange; 1997; 509-33.
11. Has R, Saygılı R. Doğum Operasyonları, In: Berkman S, Has R. (eds). *Doğum Bilgileri*. İstanbul: Nobel Tıp Kitabevi; 2004; p. 64-6.
12. Hopkins K. Are Brazilian women really choosing to delivery by cesarean? *Soc Sci Med* 2000; 99: 557-80.

Determination of the Median Levels of Triple Test Screening Parameters in Our Region

Nalan Akalın, Serap Arıkan

Başkent Üniversitesi Alanya Hastanesi, Biyokimya, Antalya

Abstract

Objective: The purpose of this study was to determine the median values of the triple test screening parameters in pregnancy and reevaluate the risky pregnancies according to the classical cut-off values by the way of the new median values in our region.

Methods: In this study we evaluated the serum hormon values of 700 pregnant women who admitted to Biochemistry Laboratory for the prenatal triple test between 2003-2006.

Results: The median values of 1130 patients were calculated for each parameters between the gestational 16-19 weeks. We found that the alpha fetoprotein median values were significantly low according to the values used 16th-19th weeks ($p < 0.05$).

Conclusion: As a result we conclude that using the median values of a specific region during the evaluation of prenatal risk will be the matter of fact and further unnecessary evaluations can be prevented.

Keywords: Prenatal diagnosis, screening tests, median, Down syndrome.

Üçlü test tarama belirteçlerinin bölgemize ait medyan değerlerinin belirlenmesi

Amaç: Bu çalışmadaki amacımız, gebelik taramasında kullanılan üçlü test tarama belirteçlerinin bölgemize ait medyan değerlerini belirlemek ve kullanılan medyan değerlere göre saptanan riskli gebelikleri yeni medyanlara göre tekrar değerlendirmektir.

Yöntem: Başkent Üniversitesi Alanya Uygulama ve Araştırma Merkezi Biyokimya laboratuvarına 2003-2006 yılları arasında üçlü tarama testi yaptırmak için başvuran 16-19 gestasyonel haftalar arasındaki toplam 1360 gebede ölçülen üçlü test biyokimyasal belirteçlerin medyan değerleri retrospektif olarak incelendi. Kullanılan programda girilmiş olan medyan değerleri ile arasındaki farklar araştırıldı. Riskli kabul edilen gebeliklerin risk durumu yeni medyanlara göre tekrar değerlendirildi.

Bulgular: Her bir belirteç için 16-19 gestasyonel haftalar arasına ait medyan değerleri hesaplamayı etkileyecek veriler çıkarıldıktan sonra toplam 1130 gebe üzerinden belirlendi. Bulduğumuz alfa-fetoprotein medyan değerleri kullanılan medyan değerlerine göre 16-19. haftalarda anlamlı oranda düşük olarak tespit edildi ($p < 0.05$). Human koryonik gonodotropin medyan değerlerinde 17. haftada anlamlı oranda düşüklük tespit edilirken ($p < 0.05$), 16, 18 ve 19. haftalarda anlamlı bir artış olduğu gözlemlendi ($p < 0.05$). Ankonjuge östriol medyan değerleri 18. haftada anlamlı oranda olmak üzere ($p < 0.05$) 16, 17 ve 19. haftalarda düşük olarak saptandı. Önceden riskli olarak belirlenen ve medyan hesaplaması sırasında analize dahil edilmeyen 156 gebenin %17.9'u (28 gebe) yeni medyan değerlerine göre riskli durumdan çıktığı tespit edildi.

Sonuç: Prenatal risk değerlendirmesi sırasında kullanılmakta olan programlara girilmiş veriler yerine bölgelere ait medyan değerlerinin kullanılması ile anneye ve fetüse risk getiren gereksiz invazif girişimlerin önlenebileceği kanısındayız.

Anahtar Sözcükler: Prenatal teşhis, tarama testleri, medyan, Down sendromu.

Introduction

Genetic disorders are an important group of disorder giving rise to mental and physical defects and also social and economic problems together. As a result of having no way of treatment, the preventive prenatal diagnostic studies come out. One of the studies is a screening test performing at pregnant women between 16-20 weeks of pregnancy which is known as triple test.^{1,2} Screening tests are used for revealing the frequency of a little group of patient carrying high risk for a specific anomaly in a big group of society. After the risk estimation, high and low risk groups can be defined by using an obvious cut-off value. There can be also false positive values in group of having positive screening test results.² It is important that this false positive result ratio should be in an acceptable level because these patients undergo invasive tests like amniocentesis and corion villus biopsy which has the risk of fetal exitus, spontane abortus and intrauterine exitus between 2.4%-5.2%.³ In 1988 Prof. Dr. Wald developed the Triple Screening test in London. Trizomi 21 patients can be determined by these tests as the ratio of 60-65% by evaluating the chemical indicators as maternal age, AFP, β -hCG and unconjugated ostriol (μ E3) together. According to the metaanalysis the negative sides of these tests are the low diagnostic (67%) and false positivity (5%) rates. However, suggesting advanced investigations Down Syndrome determination ratio changes 1/25 to 1/77 in pregnant. Determination of neural tube defects with the test is much higher.^{3,7} The secretion levels of maternal alpha fetoprotein (AFP), Human chorionic gonadotrophin Beta (β -hCG) and μ E3 are independent from gestational week and are giving more useful information about the risk than the maternal age. While AFP and μ E3 levels are

increasing in the second trimester of pregnancy the β -hCG levels go down. Because of this, for the purpose of easiness and obtaining the equation between units, the values of all three parameters are converted to multiple of median (MOM) unit by the way of dividing the median values by matching values of the pregnancy week. To determine the gestational week, screening programs generally use the calculated gestational age with ultrasonographic (USG) biparietal diameter (BPD). For a numerical estimation it is statistically required to take into consideration of the risk with maternal age and some other factors. This evaluation and the determination of estimated risk values can be done by using a pocket computer programme. It has shown that the diagnostic ratio of triple test by using the measurement of only the maternal AFP is 33% where as including β -hCG this ratio rises to 53%, and also including μ E3 it rises to 58%. The level of these markers which are effected with many factors like race, geographical distribution should be determined according to the region as many routine biochemical levels.^{7,9} It is determined that the level of AFP MOM is decreasing (0.7 MOM) and β -hCG serum level is increasing (2.5 MOM) in Down Syndrome where as AFP MoM level is increasing (3 MOM) at fetus with NTD.^{5,7} Because of its being cheap and simple triple test takes an important place in prenatal diagnosis also in our country. The reliability of the risk estimation by the application of triple test is closely correlated with median values those using for a specific region. The purpose of this study is to determine the median values of triple test markers in our regional population and to reevaluate the population that tests results are positive according to the previous computer programme.

Methods

In our study we evaluate the data of 1360 pregnant women who admitted to our hospital biochemistry laboratory to have a triple screening test between 2003 and 2006 retrospectively. Their gestational age was 16-19 (16+0 and 19+6) weeks and were living in Alanya and environment. We evaluated the levels of AFP, β -hCG and μ E3 and also the gestational age according to the biparietal diameter (BPD) determined ultrasonographically. The serum levels of AFP, β -hCG and μ E3 has included as data to evaluate those we obtained with IMMULITE ONE equipment (Diagnostic Products Corporation, ABD) which run with chemiluminescence method and belongs to BIO-DPC company. The MoM values were calculated comparing these three marker values obtained according to the gestational week with the median values of normal gestational population. The screening test positive pregnancies were determined by analyzing of obtained MOM levels of AFP, β -hCG, μ E3 and maternal age with other data as maternal weight, smoking, DM and twin pregnancies statistically with Prisca 4.0 (Prenatal Risk Calculation, TYPOLOG Software/ GmbH, Hamburg, Germany) programme. The MoM values were calculated by comparing these three hormone levels obtained according to the gestational week with the median values normal gestational population. During the calculation of medians, the screening positive pregnancies determined by previous programme, patients having risks related with hormones (β -hCG 2.5 MoM and higher, 0.4 MOM and lower, for AFP and μ E3 0.4 MOM and lower), twin pregnancies and having demographic data affecting the evaluations were excluded from the study. Previous screening tests positive pregnancies were reevaluated according to the new median values. Triple test cut-off values were accepted

as 1/250 for Down Syndrome and 1/100 for Trisomy 18. SPSS 11.0 (SPSS-11.00, Inc, Chicago, USA) programme was used for statistical analysis. To evaluate the normal distribution of data Kolmogorov-Smirnov test was used. To evaluate the differences between the normal distributed data Student-t test and Mann-Whitney-U test for the other differences between the data. Values of $p < 0.05$ were considered statistically significant.

Results

156 of 1360 pregnant women were excluded because of having positive screening test previously. 60 of remaining 1204 patients had at least one MOM value which was out of the stated interval and 14 patients had twin pregnancies. These were also excluded from the study. Median values for each marker concerning 16-19 gestational week were calculated of 1130 pregnant women. Separately and determined the percentage difference and significantly comparing with the stated median values. The demographic data of pregnant women and serum marker values distribution is summarized in table 1. We found that according to the stated median values AFP median values were significantly low as 18.6% at week 16%, 21.4% at week 17, 18.6% at week 18 and 14.9% at weeks 19 ($p < 0.001$). β -hCG median

Table 1. The demographic data of pregnant women and serum marker values distribution.

	Minimum	Maksimum	Median \pm SEM*
Age	18	43	28 \pm 0.13
Gestational week	15	21	17.2 \pm 0.30
Weight (kg)	46	116	64 \pm 0.32
BPD	28	50	37 \pm 0.11
AFP (IU/ml)	14.5	95	32.50 \pm 0.35
β -hCG (mIU/ml)	2260	60775	20961 \pm 309
μ E3 (ng/ml)	0.77	9.10	2.70 \pm 0.03
AFP (MOM)	0.41	2.92	0.81 \pm 0.00
β -hCG (MOM)	0.41	2.47	1.05 \pm 0.01
μ E3 (MOM)	0.42	7.08	0.93 \pm 0.01

Table 2. AFP median values for gestational weeks, the percentage differences and significancies.

	Situated Median	AFP Living Median	Different %	P*
16. Week	30.10	36.96	-18.6	0.000
17. Week	31.80	40.47	-21.4	0.000
18. Week	38.10	46.81	-18.6	0.000
19. Week	44.40	52.20	-14.9	0.000

Table 3. β-hCG, median values for gestational weeks, the percentage differences and significancies.

	Situated Median	β-hCG Living Median	Different %	P*
16. Week	25000	23975	+4.3	0.000
17. Week	20803	20979	-0.8	0.000
18. Week	18026	16943	+6.4	0.003
19. Week	16340	14435	+13.2	0.000

Table 4. μE3 median values for gestational weeks, the percentage differences and significancies.

	Situated Median	E3μ Living Median	Different %	P*
16. Week	2.10	2.39	-12.1	0.521
17. Week	2.85	2.89	-1.4	0.687
18. Week	3.20	3.69	-13.3	0.014
19. Week	4.20	4.29	-2.1	0.233

values were significantly high as 4.3% at week 16. (0.000), 6.4% at week 18. (0.003) and 13.2% at week 19. (0.000) and significantly low as 0.8% at week 17. (0.000). Serum μE3 median values were significantly low as 13.3% at week 18. (0.014), and 12.1% at week 16. (0.521), 1.4% at week 17. (0.687) and 2.1% at week 19 (0.233).

The percentage differences and significan-

cies between the stated and the values those we found are summarized in table 1,2,3 and 4. The median value distribution of AFP, β-hCG and μE3 concerning the gestational week and difference graphics are shown in fig. 1, 2 and 3 (A and B). 28 (17.8%) of 156 pregnant who were excluded from the study because of having positive screening test result for the stated median value were determined to be out of the positivity according to the new median levels.

Discussion

The aim of the measurements in clinical laboratory is to diagnose, to follow and to evaluate the health condition. It is observed that widespread application and to put the statement “

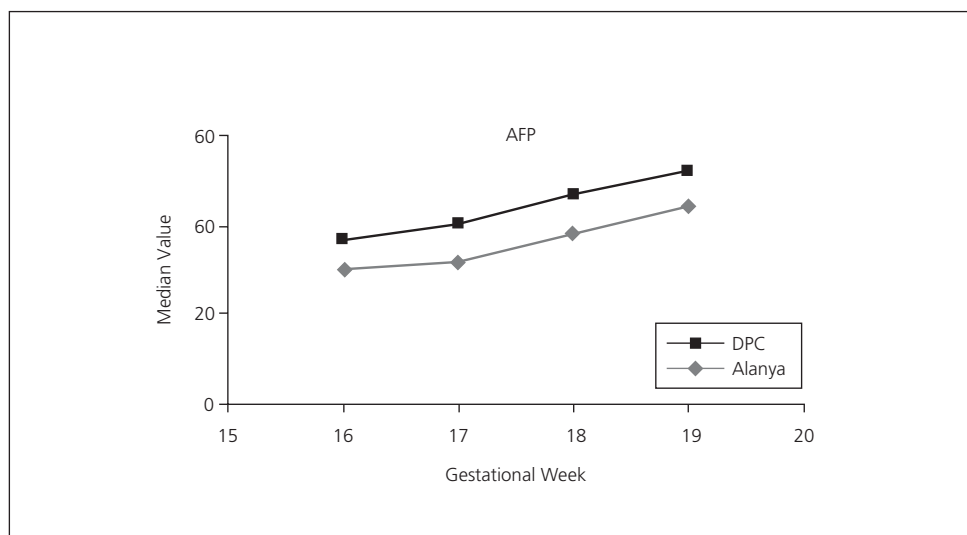


Figure 1a. The median values distribution for AFP levels in gestational weeks.

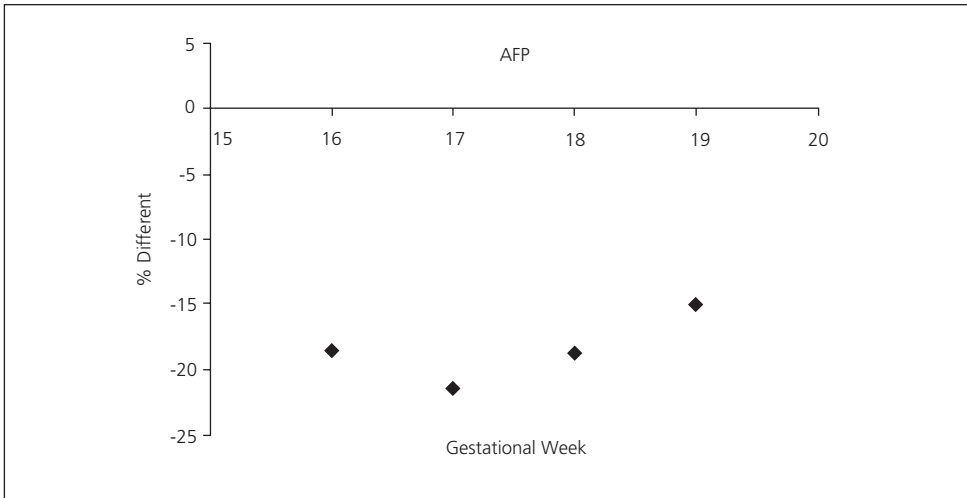


Figure 1b. AFP different figure.

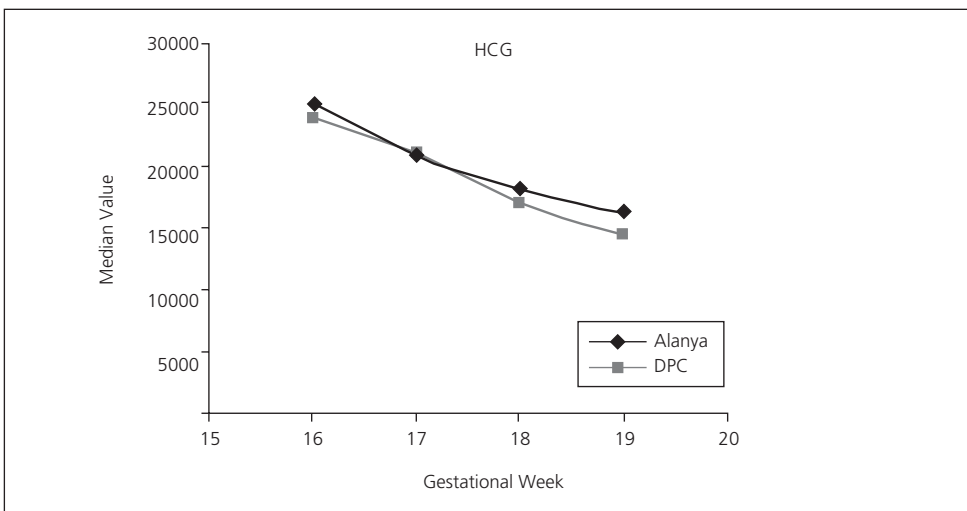


Figure 2a. The median values distribution for β -hCG levels in gestational weeks.

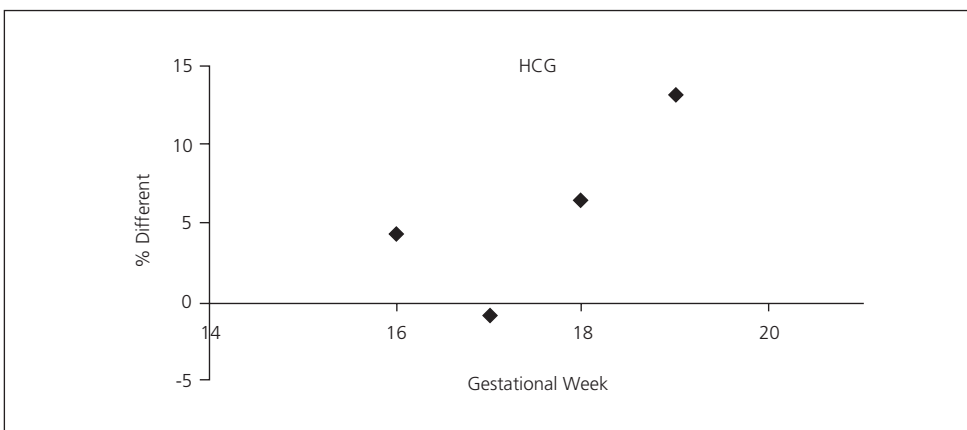


Figure 2b. β -hCG different figure.

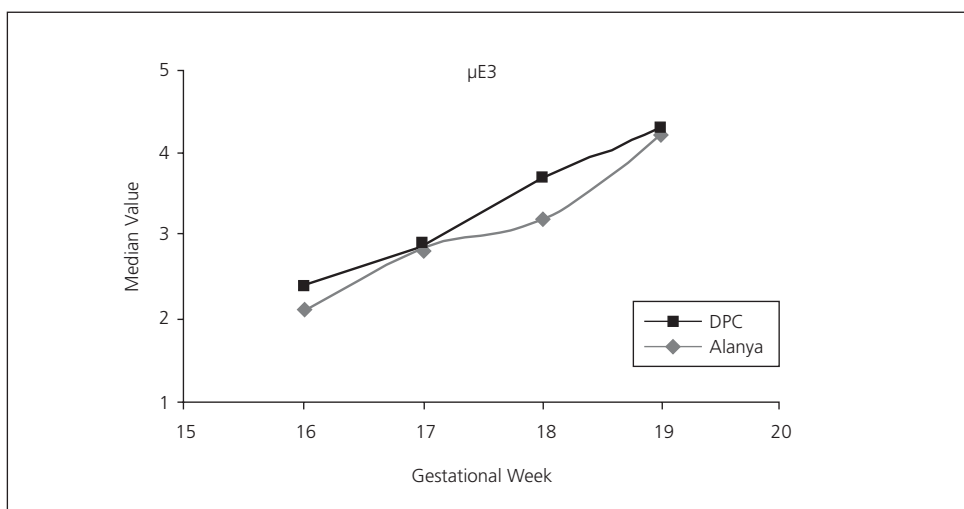


Figure 3a. The median values distribution for μ E3 levels in gestational weeks.

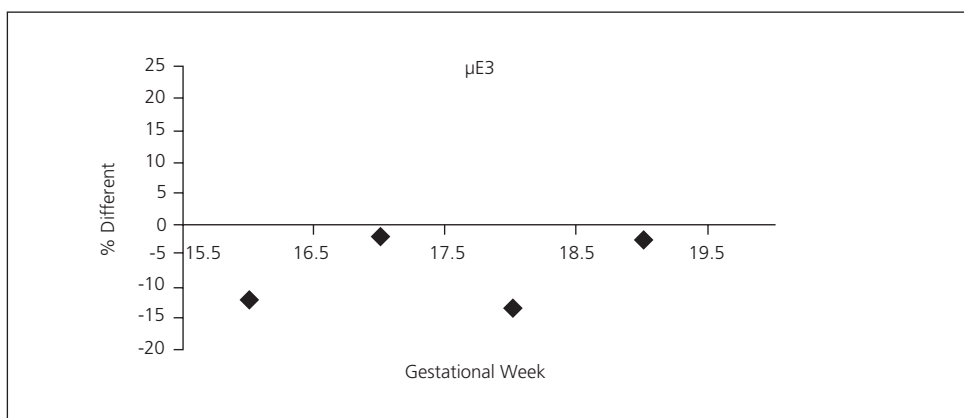


Figure 3b. μ E3 different figure.

All laboratory should calculate its own reference interval” into practice is difficult because of the methodologic and regional differences although it is an accepted decision at international platform. In prenatal risk screening risk calculations are done by the MOM values so the detection of the local regional median values have more importance.¹⁰ Laboratory test results should not be the cause of dilemma concerning especially the critical decision levels. Besides these values can affect the physician’s judgement can also be the cause of negativness in patients life. For these reasons the in order to

evaluate the risk with triple screening tests application of the analysis should be reliable and determination of the median values should fit with the society and the laboratory conditions.^{11,12} The excessive cost and the affects on taking extremely important decisions with the results make this subject actual. Following the evaluation some patients undergo invasive procedures (amniocentesis, corion villus biopsy, fetal blood exam) unnecessarily while the other patients are being excluded from the risk group although they should be in. In our country the acceptance rate of amniocentesis

among risky pregnancies is low. Low level of education and economical condition of the patient group can be the cause of this situation. Kaya et al. stated the necessity of suggesting screening tests also

to young pregnant preceding the invasive procedures.¹³ In recent years the studies concerning the regional median values arrangement and comparing the different measurement parameters revealed the changeable properties of the risk factors.¹¹⁻¹⁴ In their studies Johnson et al. considering the maternal weight and race they stated the necessity of using MOM values.¹⁵ Raynaolds et al. revealed that differences in weight corrected MOM values estimated with the two approaches are highly significant ($p < 0.001$).¹⁶ Wald et al. showed in their study that MOM adjustment for values in a previous pregnancy improves overall screening performance and substantially reduces the high recurrent false-positive rate.¹⁷ This adjustment can be routinely applied in screening programmes through the screening software used to interpret a women's screening results. Knight et al. stated that the percentages used for calculating the MOM values are sensitive to inaccurate and imprecise assays, inappropriate reference data and long term assay drift.¹⁸ Xia et al. showed that screen positive pregnancies had increased risk of chromosomal abnormalities. Pregnancies with positive screening results had significantly higher risk of adverse outcomes than those with negative results ($p < 0.05$).¹⁹ According to the new median levels 28 (17.9%) of 156 previously risky pregnant were come out of the risky status and follow ups showed that there were no chromosomal abnormalities.

Conclusion

In our study we concluded that it is important to use the regional median values in screening tests instead of programmed for preventing

the fetus and the pregnant from the risky and invasive procedures.

References

1. Tolmie JL. Down syndrome and other autosomal trisomies. In: Rimoin DL, Connor JM, Pyeritz RE. (eds). Emery and Rimoin's Principles and Practice of Medical Genetics. 3rd ed. New York: Churchill Livingstone; 1996. p: 925-71.
2. Şentürk L, Hekim N. Prenatal tanıda noninvaziv yöntemler. In: Aydın K (ed). Prenatal Tanı ve Tedavi. Perspektiv: İstanbul; 1992; p: 40-51.
3. Ager RP, Oliver RW. In the risks of mid-tremester amniocentesis being a comparative, analytical review of the major clinical studies. Salford 1986: 197.
4. Cuckle H. Biochemical screening for Down syndrome. *Eur J Obstet Gynaecol Reprod Biol* 2000; 92: 97-101.
5. Bogart MH, Pandian MR, Jones OW. Abnormal maternal serum chorionic gonadotropin levels in pregnancies with fetal chromosome abnormalities. *Prenat Diagn* 1987; 7: 623-30.
6. Merkatz IR, Nitowsky HM, Macri JN, Johnson WE. An association between low maternal serum alpha-fetoprotein and fetal chromosomal abnormalities. *Am J Obstet Gynecol* 1984; 148: 883-6.
7. Wald NJ, Kennard A, Hakshaw A, McGuine A. Antenatal screening for Down's syndrome. *J Med Screen* 1997; 4: 181-246.
8. Haddow JE. Prenatal Screening for open neural tube defects Down's Syndrome and other major fetal disorders. *Semin Perinatal* 1990; 14: 488-95.
9. Ashwood ER. Maternal serum screening for total defects. In: Burtis CA, Ashwood ER. (eds). Tietz Textbook of Clinical Chemistry. 3rd ed. Philadelphia: W.B. Saunders Company. 1999; p. 1744-57
10. Cuckle HS, Wald NJ, Thompson S. Estimating a woman's risk of having a pregnancy associated with Down's syndrome using her age and serum alpha-fetoprotein level. *Br J Obstet Gynaecol* 1994; 387-402.
11. Haddow JE, Palomaki GE, Knight GJ. Prenatal screening for Down's Syndrome with use of maternal serum markers. *N Eng J Med* 1992; 327: 588-93.
12. Heyl PS, Miller W, Canick JA. Maternal serum screening for aneuploid pregnancies by alpha-fetoprotein, hCG and unconjugated estriol. *Obstet Gynecol* 1990; 76: 1025-31.
13. Kaya H, Çerçi SS, Kömek H, Yayla M, Alp MN, Oral D ve ark. Bölgemiz gebelerinde triple test ile prenatal tarama sonuçları ve sitogenetik değerlendirilmeleri. *Perinatoloji Dergisi* 2004; 12: 38-42.
14. Miller CH, O'Brien TJ, Chatelain S, Butler BB, Quirk JG. Alteration in age-specific risks for chromosomal trisomy by maternal serum alpha-fetoprotein and human chori-

- onic gonadotropin screening. *Prenat Diagn* 1991; 11: 153-8.
15. Johnson AM , Lingley L. Correction formula for maternal serum alphafetoprotein. *Lancet* 1984 6; 2(8406): 812.
16. Reynolds TM, Vranken G, Van Nueten J. Weight correction of MOM values which method? *J Clin Patbol* 2006; 59: 753-8.
17. Wald NJ, Barnes IM, Birger R, Huttly W. Effect on Down syndrome screening performance of adjusting for marker levels in a previous pregnancy. *Prenat Diagn* 2006; 26(6): 539-44.
18. Knight GJ. Quality assessment of a prenatal screening program. *Early Hum Dev* 1996; 30: 49-53.
19. Xia YP, Zhu MW, Li XT, Zhou HP, Wang J, Lv JX, et al. Chromosomal abnormalities and adverse pregnancy outcome with maternal serum second trimester triple screening test for fetal Down syndrome in 4,860 Chinese women. *Beijing Da Xue Xue Bao* 2006; 18; 38: 49-52.

The Role of Ultrasound in Early Pregnancy in Prediction of Miscarriages

Ahmet Jakal, Hüsnü Görgeç, Banu Dane, Cem Dane, Ahmet Çetin, Murat Yayla

Haseki Eğitim ve Araştırma, Kadın Hastalıkları ve Doğum, İstanbul¹

Abstract

Objective: Abortion is a multifactorial situation which is difficult to prevent. This study aimed to identify patients with a greater risk for pregnancy loss, depending on transvaginal ultrasound findings in early pregnancy weeks.

Methods: Patients presenting with the suspicion of pregnancy were taken into the study. Exclusion criteria were the presence of a known medical disorder and recurrent abortions. Depending on the time of referral, women were evaluated with transvaginal ultrasonography either during the 5-6th weeks or 7-8th weeks. Gestational sac dimensions, yolk sac diameter and morphology, crown-rump length and fetal heart rate were recorded. Patients were followed-up and these findings were compared with those of miscarriages.

Results: Eighty seven patients were included in the study. 19 of these (21%) were miscarriages. Mean gestational sac diameter did not demonstrate any differences between groups both in early pregnancy weeks or in the 7-8th weeks. Mean yolk sac diameter was high in the abortion group at early weeks ($4.1 \text{ mm} \pm 0.9$ vs $3.1 \text{ mm} \pm 1.0 \text{ mm}$, $p=0.003$). Yolk sac calcification was more frequent in abortus patients (3 vs1, $p=0.001$). Fetal heart rate was low in the abortus group in the second time-period (95.2 ± 19 beat/min vs 110.9 ± 22 beat/min, $p=0.03$). The difference between gestational sac diameter and CRL was $>5 \text{ mm}$ in all live births as compared to two pregnancies >5 in the abortus group.

Conclusion: Using ultrasonography in early pregnancy for determining the difference between gestational sac diameter and CRL, evaluating the diameter and morphology.

Keywords: Ultrasonography, gestational sac, yolk sac, abortion.

Erken gebelikte ultrasonografi bulgularının gebelik kayıplarını öngörmedeki yeri

Amaç: Abortus çeşitli faktörlere bağlı olarak gelişen, önlenmesi sorun olan durumlardandır. Bu çalışma erken gebelikte transvaginal ultrasonografi ile yapılacak bir değerlendirme ile abortus riski yüksek olabilecek olguları saptamak amacıyla planlandı.

Yöntem: Adet gecikmesi ve gebelik şüphesi ile başvuran hastalar değerlendirildi. Medikal hastalığı, tekrarlayan abortus hikayesi olanlar çalışmaya alınmadı. İlk başvuru zamanına göre 5-6. ve 7-8. gebelik haftalarındaki gebeler transvaginal ultrasonografi ile incelendi. Gebelik kesesi çapları, yolk kesesi çapı ve morfolojisi, baş-popo mesafesi, embriyo kalp atım sayısı kaydedildi. Bulgular ile ileride abortus yapan olguların bulguları karşılaştırıldı.

Bulgular: Çalışmaya kriterleri karşılayan 87 olgu dahil edildi. Bu olguların 19'u (%21) abortus ile sonuçlandı. Ortalama gebelik kesesi çapları gruplar arasında hem erken hem de 7-8. haftalarda anlamlı farklılık göstermemekteydi. Ortalama yolk kesesi çapı abortus grubunda erken dönemde yüksek iken ($3.1 \text{ mm} \pm 0.9$ 'a karşılık $4.1 \text{ mm} \pm 1.0 \text{ mm}$, $p=0.003$), ikinci dönemde fark anlamlı değildi. Yolk kesesi kalsifikasyonu abortus olanlarda daha sık idi (1'e karşılık 3 olgu, $p=0.001$). İkinci dönemde abortus grubunda ortalama embriyo kalp atım hızı düşük bulundu (110.9 ± 22 atım/dk'ya karşılık 95.2 ± 19 atım/dk, $p=0.03$). Gebelik kesesi çapından CRL değeri çıkarıldığında elde edilen sonuç yaşayan olguların hepsinde $>5 \text{ mm}$ iken, abortus grubunda iki olguda bu değer $> 5 \text{ mm}$ 'idi.

Sonuç: Erken gebelikte ultrasonografi ile; 'Gebelik Kesesi - baş-popo mesafesi' değerinin hesaplanması, yolk kesesi çapı ve morfolojisinin değerlendirilmesi, embriyo kalp atım sayısının belirlenmesi gebelik prognozunun öngörülmesinde fayda sağlayabilecektir.

Anahtar Sözcükler: Ultrasonografi, gebelik kesesi, yolk kesesi, abortus.

Introduction

In the early stage of pregnancy, the evaluation of the embryo and gestational sac during the diagnostic ultrasonography is important. For example, gestational age can be determined by the measurement of gestational sac and crown rump length and the examination of yolk sac, heart activity and corionic villus can show the existing problems in early period. In the studies for determining the risk factors in symptomatic patients, maternal age and the presence of severe bleeding show the likelihood of abortus.^{1,2} In early period (Week 6-10), it was found that the 7.5% of the surviving fetus can experience abortus and the presence of fetal bradychardia and a gestational sac smaller than CRL are considered as the most important ultrasonographic markers of the loss of fetus.² In the results of another study, after the week 6-14 during which living fetus is determined, the rate of fetal loss decreased to 3.4%, whereas it was concluded that the count of heart beat cannot be beneficial in predicting the fetal loss.³

The aim of this study was to identify the cases with high abortus risk in early pregnancy by evaluating the gestational sac (GS), the diameter and morphology of yolk sac, the heart rate of embryo and CRL with transvaginal ultrasonography during the week 5-6 and 7-8 of the pregnancy.

Method

We evaluated the cases which admitted to our clinic with delayed menstruation and suspected pregnancy in May 2004-July 2005, did not want to terminate the pregnancy and has not previous recurrent abortus. The cases with diabetes mellitus, hypotiroidism, hypertension, autoimmune diseases and multiparities were excluded from the study. The cases with vaginal bleeding, subcoryonic hematoma, irregular gestational sac were not considered eligible for the

study. The age, last date of menstruation, gravida and parity were recorded. Last date of menstruation was calculated with gestational week and, for the cases who don't know their last ate of menstruation, gestational week was determined with CRL measurement.

The study was planned to prospectively examine the two periods between week 5-6 and week 7-8 of the pregnancy according to the last date of menstruation or CRL. The evaluation, examination and follow-up were performed transvaginally by the same doctor using GE Logic 400 ultrasonography device. During the first period, it was evaluated whether the pregnancy is intrauterine, the gestational sac is regular and normal and the pregnancy is consistent with the last date of menstruation. Adnexial areas were investigated for ectopic pregnancy. With ultrasonography, the yolk sac was determined in week 5-6 and the CRL and fetal heart beat (FHB) were determined in week 7-8. To determine the dimension of gestational sac, antero-posterior and longitudinal diameters in sagittal plan were measured. In addition, the transverse diameter of gestational sac in coronal plan was measured. These three values were averaged and recorded. The ultrasonographic age was recorded according to mean gestational sac diameter. In both period, where available, the morphology of yolk sac was examined; its regularity and the presence of ecogenicity were determined; in the plan where the best image was taken, the transverse diameter was measured from the outer edge to the other outer edge and the dimension was recorded in millimeter (Figure 1, 2). In the cases where the embryo was formed, CRL was measured in the best visible plan and in the longest axis and, in each case, the age of pregnancy was calculated by ultrasonography. Heart activity was examined and heart beat per minute was recorded.

The results of pregnancy were communicated by the hospital registries and by the tele-



Figure 1. A large yolk sac at 6th weeks.



Figure 2. Yolk sac calcification.

phone from the patients. The data obtained from the study were combined in Excel 2000 software (Microsoft Corp, Redmond, IL, USA) and, thereby, the statistical analyze of the data designed in this manner was performed using SPSS (SPSS Inc., Chicago, IL, USA) program, Mann-Whitney U, Student t and chi-square test. $P < 0.05$ was considered as statistical significance value.

Results

Ninety cases admitted to our clinic, which conforms to study criteria and are in early pregnancy, fulfilled the study criteria. Three of these cases were excluded because they terminated their pregnancy voluntarily. Some of the cases were only evaluated during week 7-8 because they presented in the second period. 57 cases presented in the first period, 30 cases presented in the second period and a total of 19 cases (21%) were aborted.

When the mean gestational sac diameter was evaluated, the mean gestational sac diameter of 39 cases whose pregnancy was continuing among the measures of 57 cases presented in early period (week 5-6) was calculated as 12.2 ± 4.0 mm. In 18 cases which experience abortus, mean gestational sac diameter was found to be 14.0 ± 5.0 mm ($P = 0.827$) (Table 1).

During late period, in gestational sac comparisons performed in week 7-8, mean gestational sac diameter of 68 cases whose pregnancy was continuing was calculated as 17.8 ± 5.8 mm. In 19 cases which experience abortus, mean gestational sac diameter was found to be 18.0 ± 5.31 mm; this was not found to be statistically different ($p = 0.827$). In four of 82 cases whose morphology can be clearly evaluated (4%), yolk sac was found to be ecogenic. In one of 66 cases (1.5%) with continuing pregnancy an increase of ecogenicity was present, whereas in 3 of 16 cases (18%) which experience abortus, yolk sac was found to be ecogenic. Mean yolk sac diameter measured during the first period was 3.1 ± 0.9 mm in the surviving

Table 1. Early period and findings.

Findings at 5-6. weeks	Alive (Mean+SD) (n=39)	Abortion (Mean+SD) (n=18)	P
Gestational age (mm)	12.22 ± 4.18	14.0 ± 5.85	0.827
Yolk sac (mm)	3.14 ± 0.94	4.17 ± 1.03	0.003

Table 2. Second period and findings.

Findings at 7.-8. weeks	Alive (Mean+SD)	Abortion (Mean+ SD)	P
Gestational sac (mm) (n=87)	17.81 ± 5.47 (n=68)	18 ± 5.31 (n=19)	0.827
Yolk sac (mm) (n=87)	4.64 ± 1.04 (n=68)	4.64 ± 1.36 (n=19)	0.763
Heart beat (beat/min) (n=49)	110 ± 22 (n=35)	95.2 ± 19 (n=14)	0.03
CRL (mm) (n=48)	4.64 ± 2.45 (n=48)	5.78 ± 2.77 (n=14)	0.178

embryos (n=18) and 4.1±1.0 mm in the cases which experience abortus (p=0,003) (Table 1). In the measurement of yolk sac performed in the second period (week 7-8), mean yolk sac diameter was found to be 4.6±1.0 mm in the cases which does not experience abortus. Mean yolk sac diameter was found to be 4.6±1.3 mm in the cases which experience abortus (P=0.763) (Table 2). Heart rate was evaluated in 49 cases during the second period. During the second period, mean heart rate was found to be 110.9±22 beats/min in 35 cases with continuing pregnancy and 95.2±19 beats/min in 14 cases which experience abortus (P=0.03). (Table 2). CRL was measured in the longest axis. Therefore, among 62 cases evaluated during the second trimester, 48 survived and 14 experienced abortus. Mean CRL value was found to be 4.6±2.4 mm in the cases with continuing pregnancy. Mean CRL value of the cases which experienced abortus was found to be 5.7±2.7 mm; no statistically significant difference was found (p=0.187) (Table 2). Mean gestational sac diameter minus CRL was always found to be >5 mm in the cases which did not experience abortus and <5 mm in two cases which experienced abortus. During the follow-up, Down syndrome was detected in one case. In this case, gestational sac diameter in first trimester was 11,8 mm, gestational sac diameter in the second trimester was 16.1 mm and yolk sac was observed to be round and normal. Yolk sac was 3.5 mm in the first period and 4.2 mm in the second period, whereas heart rate was found to be 90 beats/min.

Discussion

With the examinations performed during the early pregnancy using the ultrasonography, gestational sac and yolk sac diameters and CRL of the embryo is measured and heart rate of the embryo can be calculated. The predicting sensitivity of these data for pregnancy course and prognosis was investigated in several studies in the literature.

In the study performed by Oh and colleagues,⁴ a difference between the sac diameters of the cases which experienced abortus and the cases with continuing pregnancy was not found between Days 28-35 but was found between Days 36-42. Gestational sac diameters of the cases which experienced abortus were found to be less than those of the cases which did not experience abortus.

In the study performed by Cunningham and colleagues,⁵ 40 pregnant women was examined with transvaginal ultrasonography between week 5-12 and it was observed that gestational sac of the cases which experienced abortus was smaller than normal, starting from week 5.

In a study performed by Acharya and colleagues,⁶ 86 pregnant women were followed up and a three dimensional measurement was performed using a transvaginal ultrasonography in week 4; among these cases, 46 experienced abortus and no difference was found between the cases which experienced and did not experience abortus for gestational sac volume. In our study, no difference was found between the cases which experienced and did not expe-

rience abortus for the gestational sac dimension in the measurements done in both periods.

In the study performed by Lindsay and colleagues,⁷ it was reported that the likelihood of abortus in the cases with a yolk sac diameter greater than normal (>5.6 mm before week 10) is high. In the results of a recent study, it was reported that a yolk sac with great diameter can be present during a normal pregnancy but the presence of a regular yolk sac with great diameter, in the cases where no embryo is seen, can be a sign of pregnancy loss.⁸ In our study, mean yolk sac diameter of the cases which experienced abortus during the first period was found to be greater than the surviving cases; the difference was found to be statistically significant. During the second period (week 7-8), no difference was found between the yolk sac diameters. In our study, we found that the measurement of yolk sac during the week 5-6 of the pregnancy can be beneficial in foreseeing the abortus.

Harris and colleagues reported that two cases with yolk sac calcification and ecogenicity increase experienced abortus and suggested that the yolk sac calcification can be related to typical dysmorphic modifications or the presence of the calcium-binding proteins.⁹ In our study, 4 cases showed increase of ecogenicity and a possible calcification in yolk sac and three of these cases experienced abortus. Therefore, we believe that it should be noted that the cases with yolk sac calcification during early pregnancy period can show poor prognosis of pregnancy. In a study performed by Bromley and colleagues,¹⁰ the cases with a small (GS-CRL < 5mm) and normal gestational sac were separated in the examination performed in week 5.5-9 and the frequency of abortus was 94% in the cases with a small gestational sac and 8% in the normal cases. We evaluated the cases of our study by extracting CRL value from mean gestational sac diameter. Consequently, the

value was found to be ≥ 5 mm in all cases with continuing pregnancy but <5 mm in two cases which experienced abortus. Because of this statistically significant difference, we believed that calculating the "mean gestational sac diameter-CRL" value during early pregnancy can be beneficial in foreseeing the prognosis of the pregnancy.

In the literature, mean heart beat reported during week 7-8 of the pregnancy was 140-160/min. In addition, in this study performed between weeks 6-12 of the pregnancy, the threshold for the risk of fetal loss was reported to be 120 beats/min. In our study, the reason for which mean heart rate in the cases with continuing pregnancy was lower (110 beats/min) can be the method of ultrasonography M mode that we did not use and the small number of cases.

In the results of another study, it was reported that the survival rate of the embryos who have a slow heart rate at week 7 and before (<100 beats/min, week 6.2; <120 beats/min, week 6.2-7) was only 61.6% and that the risk of anomaly was increased in survivors.¹² According to the heart beat count that we found in our study, mean value was found to be less in the cases which experienced abortus in the second period than the cases which did not experience abortus and it was found to be 95 beats/min ($p=0.03$).

In addition, the case for which Down syndrome was detected had a heart rate of 90 beats/min. In the light of this statistically significant finding, it can be recommended to count the heart beat during week 7-8.

In the literature, risk of abortus was 7-24% in the cases with a CRL <5mm (<6GH) and 3.3% in the cases with a CRL 6-10mm (6-7GH). In our study, this ratio was 21% in the sum of the two period and 28% in the cases in which the heart beat was detected in the second period. It was thought that these high values can be related to the small number of cases.

Discussion

In conclusion; calculation of the value of 'Gestational sac-CRL', evaluation of the diameter and the morphology of the yolk sac, determination of the heart rate, by the routine sonographic examination at first trimester might be helpful in the detection of the cases with increased risk of abortion.

References

1. Gracia CR, Sammel MD, Chittams J, Hummel AC, Shaunik A, Barnhart KT. Risk factors for spontaneous abortion in early symptomatic first-trimester pregnancies. *Obstet Gynecol* 2005; 106: 993-9.
2. Makrydimas G, Sebire NJ, Lolis D, Vlassis N, Nicolaides KH. Fetal loss following ultrasound diagnosis of a live fetus at 6-10 weeks of gestation. *Ultrasound Obstet Gynecol* 2003; 22: 368-72.
3. Tannirandorn Y, Sangsawanq S, Manotaya S, Uerpairojkit B, Samritpradit P, Charoenvithya D. Fetal loss in threatened abortion after embryonic/fetal heart activity. *Int J Gynaecol Obstet* 2003; 81: 263-6.
4. Oh JS, Wright G, Coulam CB. Gestational sac diameter in very early pregnancy as a predictor of fetal outcome. *Ultrasound Obstet Gynecol* 2002; 20: 267-9.
5. Cunningham DS, Bledsoe LD, Tichenor JR, Opshal MS. Ultrasonographic characteristics of first trimester gestation in recurrent spontaneous aborters. *J Reprod Med* 1995; 40: 565-70.
6. Acharya G, Morgan H. Does gestational sac volume predict the outcome of missed miscarriage managed expectantly? *J Clin Ultrasound* 2002; 30: 526-31.
7. Lindsay DJ, Lovett IS, Lyons EA, et al. Yolk sac diameter and shape at endovaginal US: predictors of pregnancy outcome in the first trimester. *Radiology* 1992; 183: 115-8.
8. Cho FN, Chen SN, Tai MH, Yang TL. The quality and size of yolk sac in early pregnancy loss. *Aust N Z J Obstet Gynaecol* 2006; 46: 413-8.
9. Haris RD, Vincent LM, Askin FB. Yolk sac calcification: a sonographic finding associated with intrauterine embryonic demise in the first trimester. *Radiology* 1988; 166: 109-10.
10. Bromley B, Harlow BL, Laboda LA, Benacerraf BR. Small sac size in the first trimester: a predictor of poor fetal outcome. *Radiology* 1991; 178: 375-7.
11. Chittacharoen A, Herabutya Y. Slow fetal heart rate may predict pregnancy outcome in first-trimester threatened abortion. *Fertil Steril* 2004; 82: 227-9.
12. Doubilet PM, Benson CB, Chow JS. Long-term prognosis of pregnancies complicated by slow embryonic heart rates in the early first trimester. *J Ultrasound Med* 1999; 18: 537-41.
13. Goldstein SR. Embryonic death in early pregnancy: to new look at the first trimester. *Obstet Gynecol* 1994; 84: 294-7.
14. Levi CS, Lyons EA, Zheng XH, Lindsay DJ, Holt SC. Endovaginal US: demonstration of cardiac activity in embryos of less than 5.0 mm in crown-rump length. *Radiology* 1990; 176: 71-4.

The Role of the Bishop Score For successful Labor Induction

Alpaslan Akyol, Özcan Karademir, Ali Gedikbaşı, H. Cemal Ark, Ahmet Güllük

Bakırköy Eğitim ve Araştırma Hastanesi, Kadın Hastalıkları ve Doğum Kliniği, İstanbul

Abstract

Objective: To demonstrate the role of Bishop Scoring System in the prediction of a successful induction for vaginal delivery.

Methods: 799 pregnant women were undergone for birth induction in our hospital between December 2002 – January 2005. All patients were investigated for detailed obstetric history and obstetric ultrasonography and gynaecologic examination for Bishop score was performed. Delivery induction was performed with either Misoprostol (Prostaglandin E1 – PGE1, 25 mcg or 50 mcg) vaginally or 1% oxytocin infusion. For the statistic analyses of Bishop score and other parameters, Logistics Regression Analysis and Receiver Operating Characteristic (ROC) have been used. Statistically significance was accepted as $p < 0.05$.

Results: 34.9% (n=275) of our patients delivered abdominally (sectio cesarean) and 65.1% (n=520) delivered vaginally. Bishop Score > 4 , cervical dilatation > 0 cm were accepted as the cut off values for delivery. For a successful vaginal delivery Bishop Score ($p < 0.05$), cervical dilatation ($p < 0.05$), cervical consistency ($p = 0.020$) were found statistical significant. The other parameters of Bishop Scores were not statistically significant.

Conclusion: Multiple regression analysis proves that multiparity is the most powerful factor for a successful vaginal delivery.

Keywords: Bishop score, birth induction, succesful vaginal birth.

Bishop skorunun başarılı doğum indüksiyonunun öngörülmesindeki değeri

Amaç: Bishop skorum sisteminin başarılı vaginal doğum indüksiyonunu öngörmedeki değerini araştırmaktır.

Yöntem: Aralık 2002-Ocak 2005 tarihleri arasında tıbbi nedenlerle doğum indüksiyonu yapılan 799 gebe çalışma kapsamına alındı. Tüm gebelerden ayrıntılı anamnez alındı, rutin ultrasonografileri yapıldı ve vajinal muayene ile Bishop skorları saptandı. Doğum indüksiyonu için Misoprostol (Prostaglandin E1-PGE1)'ün 25 ve 50 mcg'lık intravajinal dozları ve %1 Oksitosin infüzyonu kullanıldı. Çalışma verileri değerlendirilirken Bishop skoru ve diğer parametrelerin öngörüsünün saptanması için Lojistik Regresyon analizleri ve Receiver Operating Characteristics (ROC) eğrileri kullanıldı. İstatistiksel anlamlılık sınırı $p < 0.05$ olarak kabul edildi.

Bulgular: Çalışma grubumuzdaki olguların %34.9'unun (n=279) abdominal, %65.1'inin (n=520) vaginal yoldan doğumu gerçekleştirdi. Bishop skoru için > 4 , servikal açıklık için > 0 cm olması, doğum şekli öngörüsünde eşik değer olarak alındı. Yaptığımız çalışmada Bishop skoru ($p < 0.05$), servikal açıklık ($p < 0.05$) ve servikal kıvam ($p = 0.02$) başarılı vajinal doğumun öngörüsü için istatistiksel olarak anlamlı bulundu. Bishop skorunun diğer parametreleri ile başarılı vajinal doğum arasında anlamlı ilişki saptanmadı.

Sonuç: Yaptığımız çoklu regresyon analizleri vajinal doğumun en güçlü belirleyicisinin multiparite ($p = 0.000$) olduğunu göstermiştir.

Anahtar Sözcükler: Bishop skoru, doğum indüksiyonu, başarılı vajinal doğum.

Introduction

Stimulation of uterus contractions by any mechanical process or by means of pharmacological agents without waiting for spontaneous delivery activity is called birth induction. For a

successful vaginal birth, cervix should soften, be obliterated and opened. When the cervix is not suitable, it is generally difficult to stimulate the delivery and this takes a long time, and the rate of interfered birth and cesarean section increas-

es. This increases the mortality and morbidity for mother and infant. Standard birth stimulation method is amniotomy and intravenous oxytocin infusion. Many methods have been tried for stimulation of delivery activity and shortening the delivery time. Today, use of misoprostol (PGE1) and dinoprostone (PGE2) in cervical maturation and the stimulation of delivery has come on the agenda. Some conditions related to cervix and fetal head should be appropriate for a successful birth induction. For this reason, some scoring systems have been put forth. The most widely used of them is Bishop scoring system. In this study, the role of Bishop scoring system in the prediction of a successful vaginal delivery is evaluated.

Methods

799 pregnant women were taken in the study for whom birth induction was planned for medical reasons in Bakırköy Maternity Hospital Gynaecological and Pediatric Diseases Training Hospital Perinatology Service between December 2002–January 2005. All pregnant women were evaluated in terms of age, number of pregnancy and birth, pregnancy week, background and family history. Alive single pregnancies that were at and above 28 weeks and that had life expectancy and head presentation were evaluated within the scope of the study. The pregnancies that were detected to have cesarean section or uterus operation history, dead fetus, more than 4000 gr approximate fetus weight, head-pelvis discord, presentation anomaly were not included in the study. The cases that were determined to have risk factors (time prescription, oligohydramnios, hypertensive pregnancy, diabetes, intrauterine growth retardation, early membrane rupture, fetal anomaly that accords with life and the birth of which is planned in elective conditions) were included in the induction protocol. Detailed medical histories of all pregnant women who were included in the study were

taken, rutin ultrasonographies were completed and Bishop scores were determined by vaginal examination. Vaginal examination was made at lithotomy position on the gynaecological Table. Cervical aperture (cm), obliteration (%), consistency (hard, medium, soft), position (retropose, middle, centralized), arriving part (-3,+3) parameters were evaluated and Bishop score was calculated out of 10. Cervix changes were evaluated beginning from the start of induction at 6-hour intervals and when necessary by vaginal examination. 2 different induction protocols were applied to the cases taken into the study upon the approvals of patients and Ethical Committee. 1st Protocol: It was applied to the pregnant women who entertained risk factor between December 2002–January 2004. In this protocol, 200 mg-misoprostol tablet was equally divided and 25 mcg-intravaginal misoprostol (PGE1) and additional method when necessary (intravaginal 50 mcg-misoprostol (PGE1), amniotomy, %1-oxytocin infusion) was applied. 2nd Protocol: Between January 2004–January 2005, intravaginal doses of Prostaglandin E1 (PGE1)-Misoprostol, 25 mcg on odd days and 50mcg on even days, and 1% Oxytocin infusion (5 Ü oxytocin into 500 cc 5% dextrose solution) was used. The same protocol was applied in the following days when the delivery was not realized in 24 hours by the protocol used. PGE1 was placed in posterior fornix at the beginning of induction and at 6-hour intervals in starting dose and by vaginal touch. Oxytocin starting dose was 1 ml/min, and it was used by increasing 1 ml/min every 30 minutes until active phase started. The induction of pregnant women who reached active phase by misoprostol was continued by oxytocin. In the cases that had 2cm and above cervical dilatation or that had more than 5 contractions in 20 minutes, misoprostol was not used. The cases for which induction was started were observed for fetal heart rate and uterus contractions every 2 hours, and by vaginal examination at least every 6 hours and when necessary. The cases that came in active phase (>4cm) were observed in

delivery room. Delivery date, hour, cesarean section reasons, infant weights, induction-delivery intervals (time) of the ended deliveries were recorded. In the induction protocol applications made at two different time, objective criteria were considered while evaluating the patients. SPSS (Statistical Package for Social Sciences) for Windows 10.0 program was used for the statistics of the data. Logistic Regression analyses and Receiver Operating Characteristics (ROC) curves were used for determining the Bishop score and the prediction of other parameters while evaluating the study data. Statistical significance was accepted as $p < 0.05$.

Table 1. Factors in Indication.

Indication of risk factor	n	%
Oligohydramnios	366	45.8
Postterm pregnancy	299	37.4
Severe pre-eclampsia	95	11.9
Mild preeclampsia	93	11.6
Chronic hypertension	30	3.8
Intrauterine growth retardation (IUGG)	30	3.8
Gestational hypertension	23	2.9
HELLP syndrome	19	2.4
Diabetes	16	2
Premature rupture of membranes (EMR)	16	2
Eclampsia	14	1.8
Fetal anomaly	11	1.4
Total (n)	1012	126.8

Results

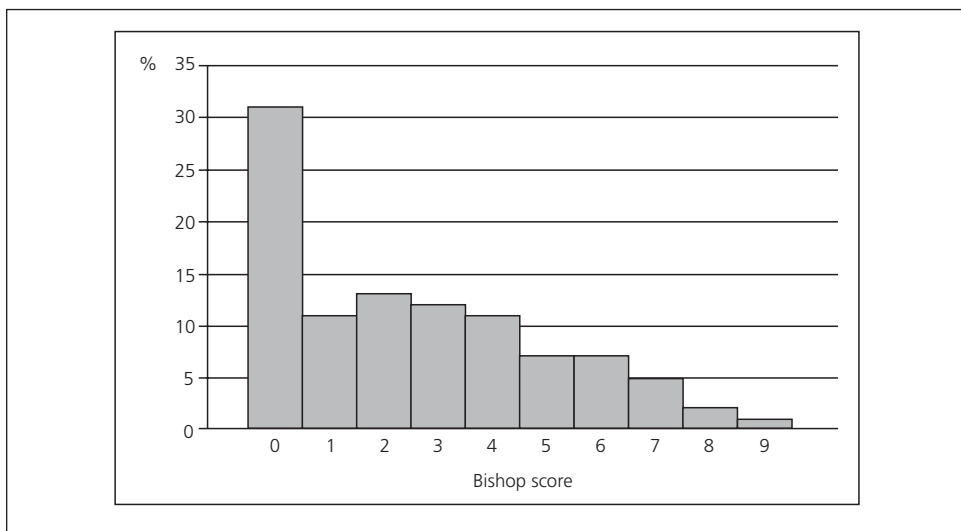
When the cases taken in induction protocol were analysed for indications, the results in Table 1 were received. Total patient number's (n) being in excess is the result of some patients' having more than one risk factor for induction. Some patients carried more than one indication in terms of induction. This was caused not by expecting the formation of more than one risk factor for indication, but by patient's having more than one risk factor at that moment. Age, pregnancy week, approximate fetal weight (gr) and amniotic fluid index (cm) of the cases were evaluated in terms of the

smallest, biggest and median values. Median age was evaluated as 26 (17-45), pregnancy week was evaluated as 40.3 (28-43), approximate fetal weight was evaluated as 3000 (800-4000), amniotic fluid index was evaluated as 7 (0-35). The smallest and the largest parity value was between 0 and 7 in terms of parity features. Parity of 64v of the cases was 0, the parity number was 1 in 18% of the cases, and it was 2 in %10, and in the remaining cases the number of parity was 3 and over 3 at the decreasing rates. Distribution of 799 cases whose Bishop score

Table 2. Distribution of cases according to Bishop score.

	<1cm	423 (53%)
Cervical dilatation	1-2 cm	342 (43%)
	3-4 cm	34 (4%)
	<%40	604 (76%)
Cervical ripening	40-50%	152 (19%)
	60-80%	43 (5%)
Cervical softness	Hard	337 (42%)
	Medium	215 (27%)
	Soft	247 (31%)
Cervical position	Retropoze	395 (49%)
	Santralize	187 (23%)
Station of head	-5, -3	755 (94%)
	-2	34 (4%)
	-1, 0	10 (1%)

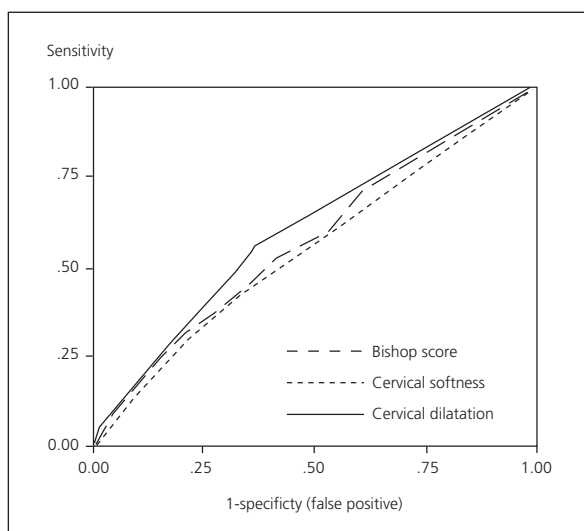
was determined by vaginal examination and induction protocol started and the delivery was realized is shown in table 2 in terms of Bishop score features. Bishop score distribution rates were shown as percent in Graphic 1. 34.9% of the patients (n=279) delivered abdominally (sectio cesarean). Among the ones who delivered abdominally, 73.5% (n=205) delivered with fetal distress indication, 10.8% (n=30) delivered with unsuccessful induction indication, 6.1% delivered with head-pelvis disorder indication, 6.8% (n=19) delivered with non-progressive labour indication, 0.7% (n=2) delivered



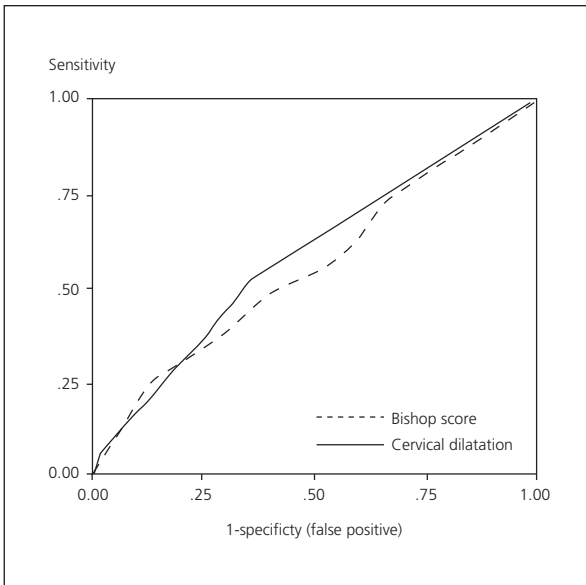
Graphic 1. Distribution of the cases according to modified Bishop score.

with large infant indication (the cases that received this indication after driven to labour after induction), 1.8% (n=5) delivered with bad maternal general state indication, 0.4% (n=1) delivered with cordon prolapsus indication. When the cases taken in induction were evaluated in terms of active phase success, 22.5% (n=180) of 799 patients could not pass to active phase, and 77.5% (n=619) successfully passed to active phase. 51.6% (n=412) of the patients could not delivered vaginally within the first 24 hours after the induction, 48.4% (n=387) delivered vaginally within the first 24 hours after the induction. 65.1% (n=520) delivered vaginally, 34.9% (n=279) delivered abdominally. 77.5% of the cases progressed to active phase with induction, 48.4% of the cases delivered vaginally within 24 hours. The effect of Bishop score and its components on a successful vaginal birth before the induction was searched. Successful vaginal delivery defines the vaginal deliveries within the first 24 hours after the induction. With ROC curves (Graphic 2), the precision of cervix aperture to predict a successful vaginal delivery within the first 24 hours after the induction was determined as 74%, and specificity

was determined as 36% (If cervical aperture is >0). The precision of Bishop score to predict a successful vaginal delivery after the induction was determined as 56%, and specificity was determined as 62%. (If Bishop score is >4). According to this precision and specificity rates, it was found that cervical aperture ($p < 0.05$), cervical consistence ($p < 0.05$) and Bishop score ($p < 0.05$) is statistically significant ($p < 0.05$) in the prediction of delivery (Table 3). The effect of Bishop score and its components on a successful vaginal



Graphic 2. ROC curve for successful vaginal delivery.



Graphic 3. ROC curve for prediction of vaginal delivery.

birth before the induction was searched. With ROC curves (Graphic 3), the precision of cervical aperture to predict vaginal delivery was

Table 3. ROC curve for Bishop score for vaginal delivery prediction.

	Odds ratio (%95 confidence interval)	P
Cervical dilatation	0.601 (.562 - .640)	.000
Cervical ripening	0.534 (.494 - .574)	.096
Cervical softness	0.547 (.508 - .587)	.020
Cervical position	0.529 (.489 - .569)	.154
Station of head	0.519 (.479 - .559)	.352
Bishop score	0.571 (.532 - .611)	.000

Table 4. ROC curve for Bishop score for vaginal delivery prediction.

	Odds ratio (%95 confidence interval)	p
Cervical dilatation	0.586 (.545 - .627)	.000
Cervical ripening	0.529 (.488 - .571)	.166
Cervical softness	0.537 (.496 - .579)	.079
Cervical position	0.525 (.484 - .567)	.231
Station of head	0.506 (.464 - .548)	.767
Bishop score	0.557 (.516 - .598)	.557

determined as 53%, and specificity was determined as 63%. (If cervical aperture is >0). The precision of Bishop score to predict vaginal delivery after the induction was determined as 25%, and specificity was determined as 85% (If Bishop score is >0). According to the obtained p values, cervical aperture and Bishop score were determined as the most significant parameters for vaginal delivery prediction ($p < 0.05$). It was determined that other parameters in Bishop score were not statistically significant in the prediction of vaginal delivery ($p > 0.05$) (Table 4). Logistic regression analyses were made to all parameters in terms of prediction of delivery type. $p < 0.05$ values were accepted as significant, $0.1 > p > 0.05$ values were accepted as significant at limit, $p > 0.1$ values were accepted as non-significant. It was seen that the prediction of 88.1% of successful vaginal deliveries and 31.9% of the cesarean section deliveries is possible with multiple Logistic regression analyses that used all relevant parameters (oligohydramnios, time prescription, acute preeclampsia, mild preeclampsia, chronic hypertension, gestation hypertension, hellp syndrome, eclampsia, intra uterine growth retardation, diabetes, early membrane rupture, fetal anomaly that accords with life, nulliparity, multiparity, amniotic fluid amount, age of the mother) (Table 5). In the pattern created with multiple Logistic regression analysis; multiparity (previos vaginal delivery, $p = 0.000$) was determined as the most signifi-

Table 5. Logistic regression for method of delivery.

Shape of the observed birth	Estimated delivery type		
	Type of delivery		Percent correct
	Cesarean n=151	vaginal delivery n=648	
Cesarean n=279	89	190	31.9
vaginal delivery n=520	62	458	88.1

cant parameter statistically in the prediction of successful vaginal delivery. Eclampsia risk factor ($p=0.017$) and Age ($p=0.021$) were determined as the other significant parameters. Again in multiple logistic regression analyses, cervical obliteration ($p=0.05$) and Cervical dilatation ($p=0.84$) that are the components of Bishop score were determined as the parameters that have weak prediction performance. It was seen that cervical consistence ($p=0.160$), cervical position ($p=0.289$), fetal head level ($p=0.205$), total Bishop score ($p=0.570$) and other parameters were in the background.

Discussion

When risk factors that threaten the life of mother and infant, birth induction is a frequently used birth application without waiting for the spontaneous birth contractions. An immature cervix is an important reason that constrains the induction success of the birth. Induction of birth activity is a long and hard process, and it is important as some negativities may develop for mother and fetus. It is important to predict the vaginal delivery chance of a pregnant woman at the beginning of induction. If the induction monitoring process that may be risky sometimes is mostly concluded with cesarean section, this process may be seen as a waste of time and an unnecessary risk. Therefore, various indicators have been developed in order to set apart the pregnant women who have high chance of vaginal delivery. One of the most studied parameters is Bishop score parameters. Maturing the cervix unnaturally and birth induction is among the most important steps of birth applications. The most widely used birth induction method is oxytocin intravenous infusion method. However, in the cases where the cervix is not matured, this process has some negativities such as long induction period and high failure rate. Therefore, local effective pharmacological and

physical substances have been developed. For this reason, hypertonic solutions (hypertonic saline, urea glucose solution), Rivanol solutions, balloon catheter, cervical expanders that swell by keeping water (laminerya, lamisel, dilopen), antiprogestins and relaxin have been used for years. Recently, however, progesterone antagonists and prostaglandins have been used for this reason. Local drugs that are mostly used today are prostaglandin preparations.^{1,2} Unfortunately, there is not a single method suggested although various techniques or drugs have been developed in birth induction. The reason is that every method has its positive and negative factors. In oxytocin use, prolonged induction-birth interval and high failure rate is seen.^{3,4} Only foley catheter's being placed affects the cervix mechanically, however, the contractions start late.^{5,6} Prostaglandins were given systematically, however, recently they are used locally. Systemic absorption of prostaglandines cause uterus hypertony, nausea and vomiting. In order to avoid these effects, protaglandins are used as intravaginal, intracervical, extraamniotic, pesser or supozituar gel.^{7,8} The application of prostaglandines are not new for birth induction. Calder and Embray defined and used PGE2 first in 1973. The use of misoprostol was applied in 1992 by Morguver and its friends.⁹ We used PGE1-Misoprostol in our study as 25 mg and 50 mg doses and intravaginally, and used Oxytocin in its 1% form and as intravenous infusion. Our aim is to evaluate the prediction performance of Bishop score and its parameters in a successful vaginal delivery, induction-birth interval before induction. Successful delivery means vaginal delivery realized within the first 24 hours after the induction. 62.5% ($n=499$) of our study group had never delivered before, 37.5% ($n=300$) delivered at least once. 34.9% ($n=279$) delivered abdominally (cesarean section), 65.1% ($n=520$) delivered vaginally. The reason of total cesarean section rate's being 5-10% higher than the lit-

erature may arise from perinatology service's being a reference center, some patients' having more than one risk factor at the same time, and pregnant woman population's not having their antenatal care and controls exactly due to low socio-cultural characteristics. The most important reason of 73.5% (n=205) cesarean section with fetal distress indication was thought to be dependent on heavy risk factors of the patients. The most important reason of 10.8% (n=30) cesarean section with unsuccessful induction indication was thought to be dependent on non-progressive labour related to abnormal cervix. 22.5% (n=180) of patients could not pass to active phase, and 77.5% (n=619) successfully passed to active phase. 51.6% (n=412) of the patients could not delivered vaginally within the first 24 hours after the induction, 48.4% (n=387) delivered vaginally within the first 24 hours after the induction. 12.4% of cesarean sections were realized after passing to active phase. The most significant parameter in terms of predicting the delivery type (vaginal/cesarean section) was determined as cervical aperture, and it was seen that Bishop score was also significant. In the study that was conducted by Mark and his friends,¹⁰ in 443 cases, it was found out that cervical aperture had a stronger prediction performance than Bishop score and its parameters before the induction, and it was proven that induction method did not affect the success of vaginal delivery. In the study that was conducted by Nancy and his friends,¹¹ in 365 cases (in nullipar and multipar pregnant women), it was found out that Bishop score is a weak clinic indicator in the prediction of successful vaginal delivery induction regardless of number of birth. In our study, Bishop score, cervical aperture and cervical consistence was found statistically significant in the prediction of successful vaginal delivery, and cervical aperture was determined as the most significant parameter ($p=0,000$). No significant relation was determined between other parameters of

Bishop score and successful vaginal delivery. Threshold value was taken as greater than 4 for Bishop score and as greater than 0 for cervical aperture in the prediction of birth type. In the study conducted by Nicolaidis and his friends,¹² in 2001 in 240 cases between 37-42 weeks in which they used Dinoprostone gel and oxytocin for induction, cervix length and Bishop score was compared. Cesarean section was found as 19.2%, while the rate of vaginal delivery within 24 hours was approximately 60%, 74.3% of vaginal deliveries within 24 hours was multipar, and induction-birth interval was significantly found shorter in multipars. Bishop score was found relevant to successful vaginal delivery and induction-birth interval. Cervix parameter was indicated to have a more powerful prediction performance in terms of these parameters. By using ROC curves, it was reported that 28 mm for cervix length and 3 for Bishop score can be used as threshold value in the prediction of successful birth. In our study, a significant relation was found between Bishop score and induction-active phase interval, induction-birth interval. A significant relation was found between cervical aperture that is the component of Bishop score and induction-active phase interval, induction-birth interval. Cervical aperture was found as the most significant parameter ($p=0,000$). No significant relation was determined between other parameters of Bishop score and induction-active phase interval, induction-birth interval. Threshold value was taken as greater than 4 for Bishop score and as greater than 0 for cervical aperture in the prediction of birth type. In the successful study conducted by Paterson-Brown and his friends,¹³ in 50 pregnant women, successful vaginal delivery and Bishop score was found clearly in relation, however, its prediction performance was insufficient. Besides, cervical length was shown not have relation with Bishop score and induction-birth interval. In the study conducted by Ellen and his friends,¹⁴

in 156 cases that were in 38th pregnancy week, it was shown that high Bishop score was in relation with successful vaginal delivery and induction-birth interval, however, cervical aperture did not have a good prediction performance for successful vaginal delivery. In our study, the precision of cervical aperture in the prediction of vaginal delivery was determined as 53%, and specificity was determined as 63%. The precision of Bishop score in the prediction of vaginal delivery after induction was determined as 25%, and specificity was determined as 85%. According to p value obtained, cervical aperture and Bishop score were determined as the most significant parameters for vaginal delivery prediction. It was determined that other parameters in Bishop score were not statistically significant in the prediction of vaginal delivery ($p > 0.05$). In the study conducted by Gonen and his friends¹⁵ in 86 cases, it was found out that cervical length and Bishop score had relation with successful induction and induction birth interval; in Logistic regression patterns, however, it was shown that only Bishop score and number of birth had significant relation with successful induction as independent variable. In the study conducted by Chandr and his friends,¹⁶ in 122 time prescription cases, parity, cervical dilatation, cervical obliteration, induction method and maternal weight were determined as independent predictors for successful vaginal delivery, however, it was reported that other parameters of Bishop score were not good predictors. In the study conducted by Ware and Raynor,¹⁷ in 72 cases, it was found out that both cervical length and Bishop score had relation with successful vaginal delivery and induction-birth interval. In Logistic regression patterns made, however, it was reported that only cervical length and number of birth were parameters that had independent prediction performance. In the study conducted by Deborah and his friends,¹⁸ in 1373 cases; it was shown that multiparity, cervical aperture before

induction and pregnancy age were the factors that had independent prediction performance for successful vaginal delivery, and that Bishop score did not have a strong prediction performance in the logistic regression analysis where multiple parameters were used. In the study conducted by Reis and his friends,¹⁹ in 134 cases close to term; it was shown that multiparity and Bishop score had independent prediction performance for successful vaginal delivery, however, transvaginal cervix length and fetal fibronectin were not significant. In the study conducted by Crane and his friends,²⁰ in 781 cases; logistic regression analysis where multiple parameters are used was used, and it was shown that multiparity, cervical aperture before induction, cervical obliteration, cervical position and pregnancy age were independent predictors for successful vaginal delivery, and that Bishop score did not have a good prediction performance. In our study, in the multiple Logistic regression pattern made, it was determined that the most significant parameter was multiparity in terms of successful induction. After multiparity, eclampsia risk factor and pregnancy age was found in relation with successful vaginal delivery as independent variable. It was considered that maternal negativities that accompany eclamptic pregnant women increased the cesarean section possibility. Eclampsia was found as a significant risk factor in terms of birth type prediction. The relation of cervical aperture and cervical obliteration with successful vaginal delivery was found weak, and no significant relation was determined for Bishop score and other parameters.

Conclusion

Delivery is realized as a result of the chain of events that induce or pressurize each other. In order to understand the birth mechanism in human completely and to comprehend each

step, more study should be made. Prostaglandins have important role in this complex mechanism. In order for the pregnancies that require induction for medical reasons to be concluded with successful vaginal delivery and healthy infants, medical parameters with high prediction performance are required. Together with many study in the literature, in our study, degree of cervical aperture is a stronger clinical indicator than Bishop score and other Bishop score parameters in the prediction of vaginal delivery within 24 hours. Besides, it was found out in our multiple regression analyses that the strongest determiner of vaginal delivery is multiparity. The studies show that stronger score and parameters that can predict successful vaginal delivery are needed. These parameters should be easy to use, should not annoy the pregnant woman, and should be an objective method, and should not have personal differences.

References

- Bartusevicius A, Barcaite E, Krikstolaitis R, Gintautas V, Nadisauskiene R. Sublingual compared with vaginal misoprostol for labour induction at term: a randomised controlled trial. *BJOG* 2006; 113: 1431-7.
- Caliskan E, Bodur H, Ozeren S, Corakci A, Ozkan S, Yucesoy I. Misoprostol 50 microg sublingually versus vaginally for labor induction at term: a randomized study. *Gynecol Obstet Invest* 2005; 59: 155-61.
- Smith JG, Merrill DC. Oxytocin for induction of labor. *Clin Obstet Gynecol* 2006; 49: 594-608.
- Radeka G, Novakov Mikic A, Ivanovic L. The Bishop score and induction of labor. *Med Pregl* 2002; 55: 189-94.
- Owolabi AT, Kutu O, Ogunlola IO. Randomised trial of intravaginal misoprostol and intracervical Foley catheter for cervical ripening and induction of labour. *J Obstet Gynecol* 2005; 25: 565-8.
- Adeniji OA, Oladokun A, Olayemi O, Adeniji OI, Odukogbe AA, Ogunbode O, Aimakhu CO, Omigbodun AO, Ilesanmi AO. Preinduction cervical ripening: transcervical foley catheter versus intravaginal misoprostol. *J Obstet Gynecol* 2005; 25: 134-9.
- Wing DA, Ham D, Paul RH. A comparison of orally administered misoprostol with vaginally administered misoprostol for cervical ripening and labor induction. *Am J Obstet Gynecol* 1999; 180: 1155-60.
- Andresen DM, Jensen JS, Uldbjerg N. Misoprostol safe preparation for induction of labor? *Ugeskr Laeger* 2006; 168: 3711-4.
- Ramos LS, Kaunitz AM, Valle GOD, Delke I, Schroeder PA, Briones DK. Labor induction with the prostaglandin E1 methyl analogue misoprostol versus oxytocin. A randomized trial. *Obstet Gynecol* 1993; 81: 332-6.
- Williams MC, Krammer J, O'Brien WF. The value of the cervical score in predicting successful outcome of labor induction. *Obstet Gynecol* 1997; 90: 784-9.
- Hendrix NW, Chauhan SP, Morrison JC, Magann EF, Martin JN Jr, Devoe LD. Bishop score: a poor diagnostic test to predict failed induction versus vaginal delivery. *South Med J* 1998; 91: 248-52.
- Nicolaides K. Preinduction sonographic measurement of cervical length in the prediction of successful induction of labor. *Obstet Gyn* 2001; 18: 623-8.
- Paterson Brown S, Fisk NM, Edmonds DK, Rodeck CH. Preinduction cervical assessment by Bishop's score, and transvaginal ultrasound. *Eur J Obstet Gynecol Reprod Biol* 1991; 40: 17-23.
- Faltin-Traub EF, Boulvain M, Faltin DL, Extermann P, Irion O. Reliability of the Bishop score before labour induction at term. *Eur J Obstet Gynecol Reprod Biol* 2004; 112: 171-81.
- Gonen R. Prediction of successful induction of labor. *Eur J Ultrasound* 1998; 7: 183-7.
- Chandra S, Crane JM, Hutchens D, Young DC. Transvaginal ultrasound and digital examination in predicting successful labor induction. *Obstet Gynecol* 2001; 98: 2-6.
- Ware V. TVU cervical measurement a predictor of successful labor induction. *Am J Obstet Gynecol* 2000; 182: 1030-2.
- Wing DA, Tran S, Paul RH. Factors affecting the likelihood of successful induction after intravaginal misoprostol application for cervical ripening and labor induction. *Am J Obstet Gynecol* 2002; 186: 1237-43.
- Reis FM, Gervasi MT, Florio P, Bracalente G, Fadalti M, Severi FM, Petraglia F. Prediction of successful induction of labor at term: role of clinical history, digital examination, ultrasound assessment of the cervix, and fetal fibronectin assay. *Am J Obstet Gynecol* 2003; 189: 1361-7.
- Crane JM, Delaney T, Butt KD, Bennett KA, Hutchens D, Young DC. Predictors of successful labor induction with oral or vaginal misoprostol. *J Matern Fetal Neonatal Med* 2004; 15: 319-23.

Aplastic Anemia and Pregnancy: Case Report

Ercan Yılmaz, Ümit Korucuoğlu, Arzu Acar, Nuray Bozkurt, Aydan Biri

Gazi Üniversitesi Tıp Fakültesi, Kadın Hastalıkları ve Doğum Anabilim Dalı, Ankara

Abstract

Background: The prevalence of aplastic anemia following pregnancy is rare. Pregnancy associated with aplastic anemia is fortunately more uncommon considering the significant morbidity and mortality for both mother and fetus. The risk to the mother is mainly in the form of hemorrhage and sepsis, while the fetus may suffer from growth restriction and even intrauterine death.

Case: We here present you a case of pregnancy complicated by aplastic anemia diagnosed at early gestational weeks.

Conclusion: While the relationship between pregnancy and aplastic anemia remains controversial, there is universal agreement that a pregnancy complicated by aplastic anemia is a serious condition.

Keywords: Aplastic anemia, pregnancy, treatment.

Aplastik anemi ve gebelik: olgu sunumu

Amaç: Gebeliği takiben aplastik anemi gelişimi nadirdir. Gebeliğe eşlik eden aplastik anemi daha da nadirdir. Gebelikte ortaya çıkan aplastik anemi anne ve fetüs açısından çeşitli riskler taşımaktadır. Annede esas olarak kanama ve sepsis görülebilirken, fetüste gelişme geriliği ve hatta intrauterin ölüm izlenebilir.

Olgu: Burada erken gebelik haftalarında tanısı konan aplastik aneminin eşlik ettiği bir gebelik sunulmaktadır.

Sonuç: Gebelik ve aplastik anemi arasındaki ilişki tartışmalı olsa da, gebeliğe aplastik aneminin eşlik etmesinin ağır bir durum olduğu üzerine tüm dünya hemfikirdir.

Anahtar Sözcükler: Aplastik anemi, gebelik, tedavi.

Introduction

Aplastic anemia was first recognized in a pregnant woman by Ehrlich in 1888. Since then, the pathogenesis of aplastic anemia has remained elusive. The prevalence of aplastic anemia following pregnancy is rare. Aplastic anemia is a subtype of anemia characterized by a decreased number of circulating erythrocytes, thrombocytes and neutrophils and a hypocellular bone marrow. This situation can be due to chemicals, drugs, infections, irradiation,

leukemia and inherited disorders. The treatment involves immunosuppressive therapy with antithymocyte globulin and cyclosporine and bone marrow transplantation.¹ The observation has been made that pregnancy results in an increase in the synthesis of placental lactogen, erythropoietin and estrogens. Placental lactogen and erythropoietin stimulate the hematopoiesis whereas estrogens suppress the marrow. Based upon these observations, Fleming suggested that the imbalance between

these three hormones might cause hypoplasia.¹ While the relationship between pregnancy and aplastic anemia remains controversial there is universal agreement that a pregnancy complicated by aplastic anemia is a serious condition.² The risk to the mother is mainly in the form of hemorrhage and sepsis, while the fetus may suffer from growth restriction and even intrauterine death. Hemorrhage and sepsis are responsible for more than 90% of maternal mortality.² Most of the fetal complications are due to maternal anemia. Maternal anemia may end up with fetal intrauterine growth restriction and mortality in the fetuses of mothers with aplastic anemia. All along with these, maternal infections may lead to the development of chorioamnionitis and the resultant preterm labor and birth.³ In the literature, fetal thrombocytopenia, placentomegaly and severe oligohydramnios have been reported. An interesting case of gangrene of the fetal intestine was reported in one case, perhaps due to chronic anemia and ischemia.² We here present you a case of pregnancy complicated by aplastic anemia diagnosed at the early gestational weeks.

Case

A 21 year-old woman was diagnosed to be pregnant at 6 weeks of gestation. When she had the symptoms of spontaneous bruising, drowsiness, epistaxis and bleeding from the gingiva, a complete blood count has been performed. The analysis revealed a hemoglobin (Hgb) level of 11 gr/dl, white blood cell count (WBC) of 2300 e3/uL and platelet count of 16000 e3/uL and reticulocyte 0.2. She did not have any past medical history and other laboratory values were normal. When she was referred to hematology department, a bone marrow biopsy was taken from the iliac crest. The bone marrow biopsy was suggesting aplastic anemia, due to severely decreased sellularity. When the test dose of anti-thymocyte globulin (ATG) (1 mg of

ATG in 100 cc saline), which binds to the receptors on the cell surfaces of the circulating erythrocytes and which is used in the dose of 150mg/10kg every 12-18 hours for 5 days for the treatment of aplastic anemia, was given, an allergic reaction had occurred. Then, cyclosporin 5mg/kg/day (a total dose of 300mg) had been started. This dose was continued till birth. The control blood counting was performed for every 3 months. The values were about Hgb:11 gr/dl, WBC: 3200-3500 and platelet: 60000, and reticulocyte 0.4. And the symptoms were regressed. The maternal and fetal complications and risks related to aplastic anemia in pregnancy was explained to the patient and her family. And they preferred to continue the pregnancy. During the pregnancy the complete blood count was performed monthly. She had no symptoms of bruising, bleeding from gingiva or nose, drowsiness, feeling tired, any infection or obstetrical hemorrhage. She was admitted to the hospital at 36 weeks of gestation for the uterine contractions. There was no bleeding or amniotic fluid leakage and her vital signs and fetal monitoring were normal. There was irregular contractions. At the cervical examination, there was 1 cm of dilatation and 40% of effacement. After the initiation of tocolytic therapy, the uterine contractions regressed and the cervical examination remained the same. The blood count values were of Hgb: 8.4gr/dl WBC: 3000 and platelet: 32000 and reticulocyte 0.6. The coagulation screen, kidney and liver function tests were normal. Obstetric, anesthetic and haematology teams planned an elective cesarean section under general anaesthesia at the advanced gestational weeks. At 38 weeks and 5 days of gestation, elective cesarean section procedure had been done under general anesthesia, upon patient's desire at this time the blood count values were of Hb: 8.2 gr/dl, WBC: 2800, PLT: 40000, reticulocyte 0.7. No transfu-

sion were needed perioperatively. A healthy female baby of 2800 gr and 48 cm was delivered with apgar scores of 9/10. The immunosuppressive therapy with cyclosporin 5mg/kg/day was continued after the delivery.

Discussion

Aplastic anemia is a serious hematological disorder characterized by pancytopenia, bone marrow hypocellularity, and absence of underlying malignant or myeloproliferative disease.⁴ As Oosterkamp concluded from his work that some substance released during pregnancy had toxic effects on bone marrow, he suggested that termination of pregnancy should be considered for management of aplastic anemia during pregnancy.⁵ Aplastic anemia is known to increase the antenatal complications. In a literature review, the ratio of preterm birth was 12.1%, the ratio of intrauterine death was 16.7%, the ratio of stillbirth was 15.1% and the ratio of spontaneous miscarriage was 16.7% among pregnant women with the diagnosis of aplastic anemia.^{6,7} Although previously cited complications are commonly encountered in cases of aplastic anemia, no such complications accompanied our case. Hemorrhage at the time of delivery/abortion is another danger. Secondary hemorrhage due to platelet deficiency is fortunately uncommon in aplastic anemia as compared to clotting factor deficiencies.² Postpartum hemorrhage is an important complication among patients with the diagnosis of aplastic anemia due to decreased platelet count and impaired function. One patient among 7 in the series of Deka and 2 patients among 10 in the series of Coudhry had postpartum hemorrhage which were appropriately handled by thrombocyte and erythrocyte transfusions.^{1,2} In our case, postpartum hemorrhage was within normal limits and no supportive treatment was needed. Fetal morbidity and mortality in terms of intrauterine growth restriction and even

intrauterine death has also been reported owing to the impaired fetal oxygenation.⁸ Intrauterine growth retardation did not complicate our case. In this case, a cesarean section was performed at 38 gestational weeks and female baby of 2800 grams (10-50 percentile) with an apgar score of 9/10 was born. No postpartum complications with the baby occurred. Way of delivery in cases of aplastic anemia is obscure once the literature is reviewed. But, usually, vaginal birth is preferred and cesarean section is performed only for obstetric indications. In our case, cesarean section was performed electively, upon patient's desire. In general, treatment for aplastic anemia includes withdrawal from offending drugs, supportive care, and some form of definitive therapy. Bone marrow transplantation (BMT) has been reported to be the most effective treatment, with a 5-year survival of 56 to 89%. However, BMT is contraindicated during pregnancy because it requires high-doses of immunosuppressive agents or radiation therapy, which would be toxic to the fetus. Although case reports have suggested a promising result with antithymocyte immunoglobulin or cyclosporine therapy during pregnancy, there is currently little agreement on the universal use of these therapies. The role of androgens is not clear and androgen treatment may cause the virilization of female fetuses. The efficacy of corticosteroids or granulocyte colony-stimulating factor is also equivocal. Overall, current evidence does not favor the routine use of any drug therapy in the treatment of pregnancy-associated aplastic anemia.⁷ Earlier case reports have proposed pregnancy termination as an alternative approach. Based on their experience of 5 cases, Aitchison and colleagues proposed to consider early termination followed by BMT for women with severe aplastic anemia diagnosed in the first trimester of pregnancy.⁸ Cyclosporine has been found to have results comparable to ATG when

used as first line therapy in non-pregnant patients. Cyclosporine (300 mg/day) and granulocyte macrophage colony stimulating factor (450 mg intravenous weekly) are used in severe aplastic anemia after 20 weeks of pregnancy.¹ Data regarding its use in pregnancy with aplastic anemia is limited. However, experience from pregnancy following organ transplant shows that cyclosporine is apparently not teratogenic. Though it is excreted in milk, fetal growth and development were found to be normal.⁹ Perhaps the most important part of treatment of aplastic anemia is supportive therapy. Supportive therapy in the form of blood and platelet transfusions was given in order to keep hemoglobin above 8 g/dL and platelet count above 20×10^9 /L. Repeated blood transfusions should ensure that maternal hemoglobin is maintained at more than 8 g/dL during pregnancy to achieve adequate fetal oxygenation.¹⁰ Similar tests and treatment modalities were employed in our case once the diagnosis was confirmed by bone marrow aspiration. As the patient had a positive anti-thymocyte globuline (ATG) test, cyclosporine treatment was initiated (5 mg/kg/day; a total dose of 300 mg). After regression of the symptoms, the patient was followed up till term with complete blood counts performed every 3 months. Aplastic anemia is a rare complication of pregnancy. Pregnancies complicated by intrauterine growth retardation, preterm labor, stillbirth and spontaneous abortion can be successfully followed till term if appropriate diagnostic tests and treatment

modalities are employed. In our case, we had successful maternal and fetal outcomes by the immunosuppressive therapy with the help of anaesthesia and haematology teams.

References

1. Choudry VP, Gupta S, Gupta M, Kashyap R. Pregnancy associated aplastic anemia—A series of 10 cases with review of literature. *Hematology* 2002; 7: 233–8.
2. Deka D, Malhotra N, Sinha A, Banerjee N, Kashyap N. Pregnancy associated aplastic anemia: maternal and fetal outcome. *J Obstet Gynaecol Res* 2003; 29: 67–72.
3. Deka D, Banerjee N, Roy K, Coudhary VP, Kashyap R. Aplastic anemia during pregnancy: variable clinical course and outcome. *Eur J Obstet Gynecol Reprod Biology* 2001; 94: 152–4.
4. Camitta BM, Storb R, Thomas ED. Aplastic anemia: Pathogenesis, diagnosis, treatment and prognosis. *N Eng J Med* 1982; 306: 645–52.
5. Oosterkamp HM, Brand A, Kluin-Nelemans JC, Vandenbroucke JP. Pregnancy and severe aplastic anemia: causal relation or coincidence? *Br J Haematol* 1998; 103: 315–6.
6. Pavithran K, Thomas M. Pregnancy associated aplastic anemia. *J Assoc Physicians India* 1996; 4: 273–7.
7. Kwon JY, Lee Y, Shin JC, Lee JW, Rha JG, Kim SP. Supportive management of pregnancy-associated aplastic anemia. *Int J Gynecol Obstet* 2006; 95: 115–20.
8. Aitchison RGM, March JCW, Hows JM, Russel NH, Gordon-Simth EC. Pregnancy associated aplastic anemia: A report of five case and review of current management. *Br J Haematol* 1989; 73: 541–5.
9. Ohba T, Yoshimura T, Araki M, et al. Aplastic anemia in pregnancy: treatment with cyclosporine and granulocyte-colony stimulating factor. *Acta Obstet Gynecol Scand* 1999; 78: 458–9.
10. Feig SA, Champlin R, Arensen E et al. Improved survival following bone marrow transplantation for aplastic anemia. *Br J Haematol* 1983; 54: 509–17.

Celiac Disease and Pregnancy: A Case Report

Tuncay Nas¹, Ercan Yılmaz¹, Ümit Korucuoğlu¹, Pınar Keskin Özcan¹, Aylar Poyraz², Rifat Gürsoy¹

¹Gazi Üniversitesi Tıp Fakültesi, Kadın Hastalıkları ve Doğum Anabilim Dalı, Ankara

²Gazi Üniversitesi Tıp Fakültesi, Patoloji Anabilim Dalı, Ankara

Abstract

Background: To report a case celiac disease (gluten enteropathy) diagnosed during the investigation of recurrent abortion who was delivered term pregnancy following appropriate management.

Case: A 30 year old patient who had 2 abortions following infertility treatment has been diagnosed as celiac disease during investigation of abortions. After the stabilization of the disease, she got pregnant via ovulation induction and insemination. She was followed closely during pregnancy and elective cesarean section was performed at 38 weeks and 5 days of gestation. A male fetus with 2990 gr, 49 cm was delivered.

Conclusion: Although celiac disease is a malabsorption syndrome, it may lead to serious maternal and fetal complications because of systemic effects of the disease. However, a successful pregnancy outcome is possible when pregestational diagnosis is made and proper management of the disease during pregnancy is achieved.

Keywords: Celiac disease, pregnancy complications.

Çölyak hastalığı ve gebelik: olgu sunumu

Amaç: Tekarlayan abortus sonrası incelemelerde çölyak hastalığı (gluten enteropatisi) tanısı konulan ve uygun destek tedavisi sonrası termde sağlıklı bir doğum yapan gebenin olgu sunumu olarak tartışılması.

Olgu: Infertilite tedavisi ile 2 kez gebe kalıp, düşük yapan 30 yaşında hastanın gebelik kayıpları nedeni ile yapılan incelemeler sırasında çölyak hastalığı tanısı konuldu. Hastalığın tedavisi sonrası tekrar ovulasyon indüksiyonu ve intrauterin inseminasyon ile gebe kalan hasta antenatal dönemde uygun destek tedavisi ile terme kadar izlendi. Gebeliğin 38 hafta 5 gününde elektif olarak sezaryenle doğurtuldu. Bir adet 2990 gr, 46 cm erkek fetus doğurtuldu.

Sonuç: Tüm vücut metabolizmasını ilgilendiren olumsuz sonuçlara neden olan çölyak hastalığı bir malabsorbsiyon sendromu olmasının yanı sıra özellikle gebelik döneminde fetal ve maternal hayatı tehdit edecek komplikasyonlara da neden olabilir. Bu hastaların ancak erken tanı ve uygun destek tedavisi ile sağlıklı bir gebelik ve doğum gerçekleştirme şansı vardır.

Anahtar Sözcükler: Çölyak hastalığı, gebelik komplikasyonları.

Introduction

Celiac disease (also known as gluten sensitive enteropathy) is a prototype a malabsorptive disease due to loss of the absorptive area of the small intestines. The main problem in celiac disease is increased sensitivity to gluten¹ Gluten is an essential component of wheat and similar cereals like oats, barley and rye and contains the protein gliadin. When the mucosa of the small intestine is exposed to gluten inflammation takes place lead-

ing to the loss of mucosal villi and as a result the intestinal surface area gradually and significantly decreases. In short resultant malabsorption causes celiacs most prominent and recurrent clinical manifestation chronic attacks of diarrhea.² Celiac disease although common in Scandinavian countries, does not yet have a reported rate of incidence in our country. However celiac disease can be seen with frequencies like 5.3/1000 in Sweden, 1/130 in Finland, 1/85 in Hungary, 1/340

in Norway and 1/330 in Holland.³ Celiac disease may appear to be a simple ailment involving the gastrointestinal system but on the contrary it is a malabsorption syndrome affecting the whole metabolism. Malabsorption may often lead to dental and gingival diseases, endocrinological dysfunctioning, problems involving the central nervous system (such as epilepsy) and musculoskeletal illnesses.⁴ It must also be borne in mind that symptoms related to the reproductive system may be the first and primary symptom of celiac disease. Patients yet to be diagnosed, may present with amenorrhea, early menopause and vaginal bleeding. Infertility is also seen with a higher incidence in celiac sufferers when compared to the unaffected population.⁵ Those that conceive (spontaneously or aided by assisted reproductive techniques), show a higher rate of recurrent miscarriages, intrauterine growth restriction, and problems like preeclampsia in comparison with the unaffected population.⁶ This case report aims to discuss how gluten sensitivity affected a patient's fertility and pregnancy outcome.

Case

A woman, 30 years of age with gravida 3, parity 0 and 2 miscarriages, not able to conceive despite a year of unprotected sexual intercourse, and applied to Gazi University, Faculty of Medicine, department of gynecology and obstetrics day clinic. In our approach towards infertility various tests were carried out her hormone profile was considered normal, a hysterosalpingogram proved her uterine cavity normal and the fallopian tubes were bilaterally patent. Her partner's spermogram was consistent with normal values. The patient underwent four trials of ovulation induction and intrauterine insemination, where two resulted in miscarried pregnancies. The patient's follow up visits revealed recurrent bouts of diarrhea and elevated liver enzymes. The patient was referred to a gastroenterology clinic for further evaluation. Results from a biopsy of the small intestine revealed atrophy of the villi, cryptic hyperplasia, increase of mononuclear inflammatory cells in the lamina propria and lymphocytic infiltration at the epithelial surface (Figure 1). The patient was hence after diagnosed

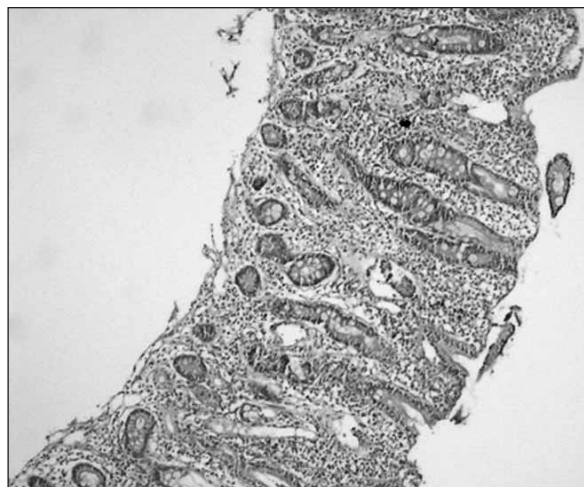


Figure 1. Histological view.

with celiac disease (gluten enteropathy). After diagnosis the patient conceived (aided by intrauterine insemination) for the third time. The patient was followed up with a routine antenatal programme, and supplemented with iron, folic acid and multivitamins. No problems arose during the following antenatal visits and the patient preferred an elective cross section at 38 weeks 5 days. The patient gave birth to a 2990gr, 46 cm male with an apgar score of 8/9. The patient's general status was good postoperatively and was therefore discharged on the second day (post operative).

Discussion

Celiac disease is defined as the permanent intolerance towards gluten including products. The immune reaction towards gluten and similar proteins occurs at the mucosa of the small intestine and causes temporary cytological damage.³ Celiac's most important symptom is diarrhea which results from the destruction of the absorptive cells lining the small intestine. However a patient with celiac disease may suffer from other symptoms besides those of the gastrointestinal system. Many results show that in comparison with the unaffected population, celiac sufferers have higher rates of infertility, recurrent miscarriages, intrauterine growth restriction and still birth.⁷ One report shows that the incidence of recurrent miscarriages and intrauterine growth

restriction is roughly 8.9 times more in celiac sufferers.⁸ Similarly another report shows that the rate of spontaneous miscarriages were 15% in this group and 6% in an unaffected control group.⁶ Our case demonstrates a history of both recurrent miscarriages and infertility. Another subject of importance, is that mothers diagnosed with celiac disease have a higher risk of carrying intrauterine growth restricted fetuses and giving birth to newborns with low birth weight. Basically this is related to malabsorption caused by recurrent attacks of diarrhea, gradually resulting in malnutrition. Bearing this in mind Ciacci et al, showed that untreated celiac sufferers had higher rates of intrauterine growth restriction and low birth weight compared to those who received appropriate treatment.⁸ Our case gave birth to a male newborn weighing 2990grams which showed no sign of intrauterine growth restriction (between 10-15 percentiles). Another notable point is that patients with celiac disease have an increased incidence of preterm births. It is thought that increased circulatory anti-glial and anti-endomysial antibodies secreted as a result of the autoimmune response responsible for celiac, may be the prime causative of preterm contractions.⁹ A retrospective study performed in Scandinavia reports the rate of preterm births (ie birth before the 38th gestational week) in patients diagnosed with celiac disease as 6.4%.¹⁰ Our case however gave birth by cross section at 38 weeks. Celiac disease, as we mentioned earlier is a prototype for malabsorption syndromes, caused by hypersensitivity to gluten. It is crucial for these patients and their fetuses to receive the daily amount of nutrition the increased metabolism requires during pregnancy. Research shows that the deficiency of certain essential trace elements and vitamins lead to considerable pregnancy complications and reproductive problems. For example; zinc deficiency may give rise to infertility, spontaneous miscarriages, congenital malformations, ablatio placenta, still births and the development of preeclampsia,¹¹ iron deficiency leads to increased rates of fetal- maternal morbidity/ mortality;¹² and folate deficiency has been found to cause congenital malformations, ablatio placenta and preeclampsia.¹³ We tried to avoid the development of these problems by supple-

menting the patient with multivitamins throughout her pregnancy. In conclusion, gluten enteropathy (celiac disease) is a malabsorption syndrome resulting from inflammation at the mucosa of the small intestine due to nutrients including gluten. It is considered a metabolic disease involving both the digestive system and many other systems. It is important in that it may lead to infertility, spontaneous miscarriages at early gestational weeks in reproductive females, and preterm contractions and birth, intrauterine growth restriction and preeclampsia in pregnant women. However, as demonstrated with this case, early diagnosis and appropriate therapy help reduce these complications.

References

1. Hin H, Bird G, Fisher P, Mahy N, Jewell D. Coeliac disease in primary care: case finding study. *BMJ* 1998; 318: 164-7.
2. Kaukinen K, Collin P, Holm K, Karvonen AL, Pikkarainen P, Maki M. Small bowel mucosal inflammation in reticulim or gliadin antibody positive patients without villous atrophy. *Scand J Gastroenterol* 1998; 33: 944-9.
3. King LA, Ciclitira PJ. Celiac disease. *Current Opinion in Gastroenterology* 2000; 16: 102-6.
4. Troncone R, Greco L, Auricchio S. Gluten sensitive enteropathy. *Pediatr Clin North Am* 1996; 43: 355-73.
5. Sher KS, Mayberry JF. Female fertility, obstetrics and gynaecological history in coeliac disease: a case control study. *Digestion* 1994; 55: 243-6.
6. Martinelli P, Troncone R, Paparo F, et al. Coeliac disease and unfavourable outcome of pregnancy. *Gut* 2000; 46: 332-5.
7. Sheiner E, Peleg R, Levy A. Pregnancy outcome of patients with known coeliac disease. *Eur J Obstet Gynecol Reprod Biol* 2006; 129: 41-5.
8. Ciacci C, Cirillo M, Auricchio G et al. Celiac disease and pregnancy outcome. *Am J Gastroenterol* 1996; 91: 718-22.
9. Rostami K, Steegers EAP, Wong WY, Braat DD, Steegers-Theunissen RPM. Coeliac disease and reproductive disorders: a neglected association. *Eur J Obstet Gynecol Reprod Biol* 2001; 96: 146-9.
10. Ludvigsson JF, Montgomery SM, Ekblom A. Coeliac disease in the father and risk of adverse pregnancy outcome: A population-based cohort study. *Scand J Gastroenterol* 2006; 41: 178-85.
11. Bougle D, Proust A. Iron and zinc supplementation during pregnancy: interactions and requirements. *Contracept Fertil Steril* 1999; 27: 537-43.
12. Seibel MM. The role of nutrition and nutritional supplements in women's health. *Fertil Steril* 1999; 72: 579-91.
13. Nelen WLD, Blom HJ, Steegers EAP, et al. Homocystein and folate levels as risk factors for recurrent early pregnancy loss. *Obstet Gynecol* 2000; 95: 519-24.

A Case of Left Isomerism With Hydrops Fetalis: A Case Report

İncim Bezircioğlu¹, Mine Tunakan², Ali Baloğlu¹, Burcu Çetinkaya¹, Merve Biçer¹

¹Izmir Atatürk Eğitim ve Araştırma Hastanesi, 1. Kadın Hastalıkları ve Doğum Kliniği, İzmir

²Izmir Atatürk Eğitim ve Araştırma Hastanesi, Patoloji Kliniği, İzmir

Abstract

Objective: The purpose of this study is to emphasize that heterotaxy syndrome should be kept in mind in any case with hydrops fetalis.

Case: Ultrasound findings were skin edema, hypoplastic thotax, pericardial efusion, ascites. Fetal boimetry was consistent with 16 weeks of gestational age. There was fetal bradycardia with 80 beats per minute. There was no Rh alloimmunization and diabetes mel-litus. Parvovirus B19 was negative for IgM.

Conclusion: Heterotaxy syndrome is a complex condition usually associated with significant cardiovascular disorders. There was a few published data on fetal heterotaxy syndrome presenting the spectrum of cardiovascular disturbances, the accuracy of prenatal diagnosis, and neonatal outcome.

Keywords: Left isomerism, hydrops foetalis, heterotaxy, polisplenia.

A Case of left isomerism with hydrops fetalis: a case report

Amaç: Bu çalışmada hidrops fetalis olgularının prenatal tanısında heterotaksi sendromlarının da akılda tutulması gerektiğini vurgula-mak amaçlanmıştır.

Olgu: Ultrasonografik tetkikinde fetal ciltte ödem, torakal hipoplazi, perikardiyal efüzyon, batında asit saptandı. Fetalbiyometrik ölçümler 16 hafta ile uyumlu idi. Fetal bradikardi saptandı, fetal kalp hızı 80 atımdakika idi. Yapılan maternal tetkiklerinde Rh izoimmunizasyonu, diyabet saptanmadı Parvovirus B19 IgM negatife bulundu.

Sonuç: Heterotaksi sendromu genellikle ciddi kardiyovasküler patolojilerle birlikte bulunan karmaşık bir bozukluktur. Fetal heterotaksi sendromları, kardiyovasküler patoloji spektrumu, doğum öncesi doğru tanı, yenidoğan prognozu üzerine yayınlanmış pek az veri bulunmaktadır.

Anahtar Sözcükler: Sol izomerizm, hidrops fetalis, heterotaksi, polispleni.

Introduction

Hydrops fetalis is a condition characterized by excess accumulation of fluid at extravascular compartments in fetal body and tissue edema of the fetus. Mortality rate depends on underlying cause. It may be formed by immune (Immune Hydrops Fetalis, IHF; %12,7) and non

immune (Non-immune Hydrops Fetalis, NIHF; %87,3) causes. The main five cases of NIHF are cardiovascular, chromosomal, thoracic, twin to twin transfusion syndrome (TTTS) and anemia.¹ Most parts of the human body are symmetric according to the sagittal plane. Asymmetric organs begin developing as midline structures and than lateralize their position in later stages.

The usual positioning of these organs are 'situs solitus' and a mirror-image reversal of this arrangement is 'situs inversus'. Situs ambiguus (Heterotaxy syndrome) results from left-right asymmetry failure of the developing embryo and occurs in 1.44 in each 10000 live births.² At heterotaxy syndromes, typical manifestations include abnormal symmetries and malpositions of the thoraco-abdominal organs and vessels. Two groups of anomalies are determined: Right isomerism and left isomerism. Right isomerism (Ivemark Syndrome, asplenia, bilateral right sidedness) is characterized by bilaterally trilobed lungs, bilaterally eparterial bronchi, an absent spleen, a midline liver, right or left sided stomach and gallbladder, complete atrioventricular septal defect, juxta positioning of aorta and vena cava, cono-truncal cardiac anomalies. Left isomerism (polisplenia, bilateral left sidedness) is characterized by bilaterally bilobed lungs, bilaterally hyperarterial bronchi, symmetrical liver, multiple splenules, right or left sided stomach, malrotation of the bowels, atrial septal defect, ventricular septal defect, bilaterally superior vena cava, interruption of the inferior vena cava with azygos continuation, and heart blocks.³ However thoracic and abdominal organs can take part of these pathologies at different degrees. Cardiac anomalies are reported in 99% of right isomerism and 90% of left isomerism cases.^{4,5} Isomerism cases form about 1% of congenital heart defects.⁵ Heterotaxy syndrome is a complicated anomaly group associated with important cardiovascular pathologies. There are few studies about prenatal diagnosis and neonatal prognosis of the spectrum of the cardiovascular pathologies in fetal heterotaxy syndromes.^{4,6,7} In this study, it is purposed to emphasize keeping in mind of heterotaxy syndrome in antenatal diagnosis of fetal hydrops.

Case

The case who was 20 years old and 18th week's pregnant (gravida 1-para 0) with diagnosis of fetal hydrops was hospitalized in our

clinic. In family history, there wasn't any baby with anomalies or marriage with a relative. There was no exposure to teratogen drugs and chemical agents during pregnancy. In ultrasonographic evaluation, edema in fetal subcutaneous tissue, ascites, hypoplasia in thorax, and pericardial effusion were determined (Figure 1). Fetal biometric measurements were consistent of 16 weeks gestation. Fetal bradycardia was determined. Fetal heart rate was 80 beats/minute. Rh isoimmunisation and diabetes weren't found. Parvovirus B16 IgM antibody was negative. The case was presented at the council of perinatology and making amniocentesis and termination of the pregnancy were advised to the family. Pregnancy was terminated after amniocentesis by family consent at 18th weeks of gestation. Karyotype was normal (46,XY) as a result of genetic amniocentesis. A 200 grams, 19 centimeters, hydropic, non viable, male fetus was delivered (Figure 2). Autopsy findings included hypoplastic lungs, bilaterally bilobated, with bilaterally hyperarterial bronchi. Levocardia was established. The examination of the heart revealed that the atrial situs showed left isomerism, both atria and ventricles were equal sized, foramen ovale was closed at atrial septa, ventricular septal defect and atrioventricular valves were normal, atrioventricular connection was concordant. Abdominal wall was



Figure 1. Ultrasonographic appearance.



Figure 2. External appearance.



Figure 3. Appearance at autopsy.

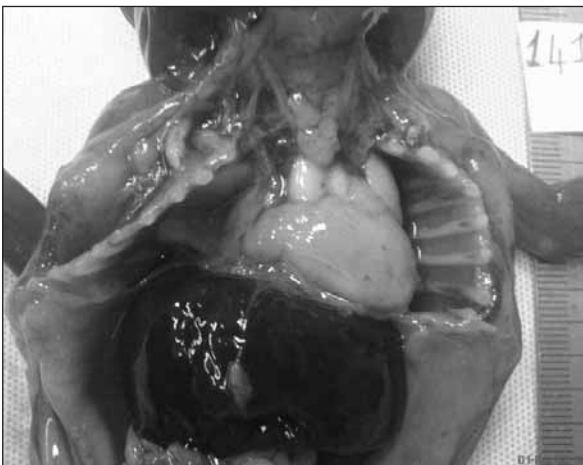


Figure 4. Appearance at autopsy.

overstretched by ascites. Symmetrical liver, three splenula in right side, malrotation of the bowel were found when abdomen was opened. (Figure 3,4) Parents were evaluated for isomerism after the autopsy of the baby. Echocardiograms were normal in both parents. Polisplenia at the left side of abdomen was found in mothers' abdominal ultrasonography.

Discussion

The case we presented showed almost whole findings of left isomerism including bilaterally bilobed lungs, hyperarterial bronchi, bilaterally morphologic left atrial appendages, sym-

metrical liver, polysplenia, and malrotated bowel. 0.4 to 2% of the infants born with congenital heart disease were diagnosed as left or right isomerism. 6% of these cases could be diagnosed antenatally.² Various chromosomal abnormalities were reported at situs inversus and ambiguous cases. Chromosomal rearrangements may lead repetition or over expression and loss of some genes. Established chromosomal abnormalities were various and spontaneous. Experimental studies established some locuses determining laterality, but more studies are required in this field. Amniocentesis is not proposed according to current knowledge.⁸ In our case, amniocentesis was performed for fetal anomalies and normal fetal karyotype was established. CRYPTIC gene and Hensen node regions were established for laterality determination.^{3,8} It is emphasized that teratogene exposure during 30 to 32nd days of pregnancy when formation of spleen, atrioventricular canal and conotruncal separation are seen in these gene regions may cause mutation.⁵ The most accused environmental factors are diabetes mellitus and retinoic acid exposure.^{4,9} There weren't any exposure to teratogenes and diabetes mellitus in our patient. Isomerism cases are usually seen sporadically. Because of recurrence in some families, mendelian patterns and genetic mechanisms responsible for laterality determination has been investigated. Autosomal recessive and X-linked recessive inheritance patterns have

been suggested.^{4,8} The case presented was thought not to be sporadically because of maternal polysplenia. Characteristics of heterotaxy syndromes are described postnatally. The diagnosis of atrial appendages, lobulation of lungs, and branching of bronchi are difficult by ultrasonography. Spleen could be discriminated after 20 weeks of gestation. Stomach, gallbladder and spleen could be added to the picture at various degrees. Determination of viscerocardiac situs can provide the prenatal diagnosis of heterotaxy syndromes, but it is not a mandatory finding. However cardiovascular findings compose more important clues for diagnosis of heterotaxy syndromes. For this reason, only fetal echocardiography centers have series on antenatal diagnosis of heterotaxy syndromes.^{4,6,7} High risk cases with suspected cardiac anomalies apply these centers.

The most frequently encountered cardiac pathologies at left isomerism cases are bilaterally superior vena cava, interruption of the inferior vena cava with azygos continuation, complete atrioventricular defect, common atrium, ventricular septal defect, partial anomalous connection pulmonary veins, and complete heart block. More serious cardiac defects impairing ventriculoatrial relationship are seen at right isomerism including complete atrioventricular septal defect, total anomalous connection pulmonary veins, transposition of the great arteries, double outlet right ventricle.^{3,5} Interruption of continuation of vena cava inferior is an important marker for left isomerism. This marker is reported 55 to 85% of cases in postmortem series.⁴ Berg C et al reported that left isomerism could be diagnosed when there are at least two of criteria for left isomerism. These criteria are 1) Complete atrioventricular septal defect 2) Interruption of the inferior vena cava with azygos continuation 3) Early fetal heart block 4) Visserocardiac heterotaxy. There are fetal bradycardia and visserocardiac heterotaxy in the presented case. It is not possible to interpret cardiac findings because of absence of fetal echocardiography. Visserocardiac situs anomaly in the case could-

n't be determined by prenatal ultrasonography. Heart block may result from immaturity of conduction system, absence of connection to atrioventricular node or abnormal positioning of atrioventricular node. Above half of the complete atrioventricular block cases are together with structural anomalies as isomerism or atrioventricular discordance. Complete atrioventricular block may lead to diminished cardiac flow and congestive heart failure because of important bradycardia.¹⁰ In left isomerism, there is an abnormal development between the atrioventricular node and ventricular conduction tissues resulting in complete heart block.⁵ Berg et al reported that fetal heart block in fetal echocardiogram could be detected after 14 weeks' gestation in 13% of isomerism series.⁴ Bartram et al reported that complete heart block was found in about 22% of survived left isomerism cases.³ Heart block in left isomerism cases is described as a poor prognostic factor.⁴ The structural heart defects together with the low ventricular rate lead to congestive heart failure and hydrops fetalis develops. Berg et al stated that hydrops fetalis developed at 18 of 24 fetuses with heart block. In these cases complete heart block is the most important reason of hydrops fetalis and intrauterine fetal demise.⁴ Left heart failure, regurgitation of tricuspid valve, hypoplastic left heart, and supraventricular tachycardia are seen in isolated closed foramen ovale cases depending on obstructive defect. Fetal hydrops secondary to supraventricular tachycardia develops in these cases.¹¹ Even though foramen ovale was closed in our case, there was no difference in ventricular size. It was thought that ventricular septal defect made right heart drainage.

Furthermore when fetal bradycardia was considered, it was accepted that the reason of fetal hydrops was not closed foramen ovale, but heart block. Left isomerism cases can be detected at early stages of pregnancy because of nuchal translucency, hydrops fetalis and fetal dysrhythm. Right isomerism cases could be detected later. Berg et al reported in their series that they could diagnose all of the right iso-

merism cases after 20 weeks of pregnancy.⁴ Left isomerism cases are mostly diagnosed antenatally, whereas right isomerism cases mostly diagnosed postnatally.⁶ This finding may be related to higher rate of intrauterine demise and termination of pregnancies after early intrauterine diagnosis of left isomerism cases. Because ventriculoatrial connection is normal left isomerism cases usually have a better prognosis at postnatal period.⁵ In isomerism cases, cardiac defects determine perinatal mortality and morbidity, visceral anomalies also affect postnatal long term prognosis. The prognosis is better and intrauterine demise is rare both of isomerism forms in the absence of heart block and hydrops fetalis. Lim et al performed cardiac correction surgery at 166 cases and analyzed 86 of them with antenatal diagnosis and suggested that overall prognosis wasn't affected by antenatal or postnatal diagnosis.² Finally, left isomerism is rare syndrome, which could be diagnosed by carefully done prenatal ultrasonography. Fetal heart block and hydrops development contribute to early diagnosis of left isomerism. Visserocardiac situs should also be evaluated, while the investigation of cardiac anomalies in non-immune hydrops fetalis cases. Heterotaxy syndromes should be remembered when cardiac anomalies and abnormal visseral situs are established.

Conclusion

Heterotaxy syndrome is a complex condition usually associated with significant cardiovascular disorders. There was a few published data on fetal heterotaxy syndrome presenting the spectrum of cardiovascular disturbances, the accuracy of prenatal diagnosis, and neonatal outcome.

References

1. De Haan TR, Oepkes D, Beersma MFC, Walther FJ. Aetiology, diagnosis and treatment of hydrops foetalis. *Current Pediatric Reviews* 2005; 1: 63-72.
2. Lim JSL, McCrindle BW, Smallhorn JF, Golding F, Caldarone CA, Taketazu M, Jaeggi ET. Clinical features, management, and outcome of children with fetal and postnatal diagnoses of isomerism syndromes. *Circulation* 2005; 112: 2454-61
3. Bartram U, Wirbelauer J, Speer CP. Heterotaxy syndrome-asplenia and polysplenia as indicators of visceral malposition and complex congenital heart disease. *Biol Neonate* 2005; 88: 278-90.
4. Berg C, Geipel A, Smrcek J, Krapp M, Germer U, Kohl T, et al. Prenatal diagnosis of cardioplenic syndromes: a 10-year experience. *Ultrasound Obstet Gynecol* 2003; 22: 451-9
5. Berg C, Geipel A, Kamil D, Knuppel M, Breuer J, Krapp M, et al. The syndrome of left isomerism: sonographic findings and outcome in prenatally diagnosed cases. *J Ultrasound Med* 2005; 24: 921-31.
6. Lin JH, Chang CI, Wang JK, Wu MH, Shyu MK, Lee CN, et al. Intrauterine diagnosis of heterotaxy syndrome. *Am Heart J* 2002; 143: 1002-8.
7. Taketazu M, Loughheed J, Yoo SJ, Lim JS, Hornberger LK. Spektrum of cardiovascular disease, accuracy of diagnosis, and outcome in fetal heterotaxy syndrome. *Am J Cardiol* 2006; 97: 720-4.
8. Aylsworth AS. Clinical aspects of defects in the determination of laterality. *Am J Med Genet* 2001; 101: 345-55.
9. Bamford RN, Roessler E, Burdine RD, Saplakoglu U, de la Cruz J, Splitt M, et al. Loss-of-function mutations in the EGF-CFC gene CFC1 are associated with human left-right laterality defects. *Nat Genet* 2000; 26: 365-9.
10. Pili G, Baccarani G, Perdo A, Picchio FM, Bovicelli L. Prenatal diagnosis of congenital heart disease. In: Fleicher AC, Manning FA, Jeanty P, Romero R. (eds). *Sonography in Obstetrics and Gynecology, Principles and Practice*. 5th ed. Stamford, Conn: Appleton&Lange; 1996; p. 167-70.
11. Hagen A, Albig M, Schmitz L, Hopp H, van Balen A, Becker R, et al. Prenatal diagnosis of isolated foramen ovale obstruction. A report of two cases. *Fetal Diagn Ther* 2005; 20: 70-73.

Congenital Pulmonary Airway Malformation: Case Report

Nihal Kılınc¹, Abdurrahman Önen², Murat Yayla¹

¹Dicle Üniversitesi Tıp Fakültesi, Kadın Hastalıkları ve Doğum Ana Bilim Dalı, Diyarbakır

²Dicle Üniversitesi Tıp Fakültesi, Çocuk Cerrahisi Ana Bilim Dalı, Diyarbakır

Abstract

Background: Congenital pulmonary airway malformation is a hamartomatous lesion of the lung, with an incidence of about 1 in 25.000-35.000 live births and prenatal diagnosis is feasible in the second trimester.

Case: Second trimester ultrasonographic examination showed bilateral large hyperechogenic intrathoracic structures and ascites in a fetus at the 23rd gestational week. Autopsy examination after termination of pregnancy revealed randomly distributed irregular bronchiole-like structures and separate dilated alveol-like structures in fetal lungs.

Conclusion: Congenital pulmonary airway malformation is a rare defect of the lung which can be suspected by typical sonographic aspect and related systemic changes. Biopsy or specimen evaluation can permit histopathologic diagnosis.

Keywords: Congenital pulmonary airway malformation (CPMA), congenital cystic adenomatoid malformation (CCAM), autopsy.

Konjenital pulmoner solunum yolu malformasyonu: Olgu sunumu

Amaç: Konjenital pulmoner solunum yolu malformasyonu 25.000-35.000 canlı doğumda bir görülen akciğerin hamartomatöz bir lezyonu olup prenatal dönemde ön tanısı yapılabilir.

Olgu: Gebeliğin 23. haftasında yapılan fetal ultrasonografik incelemede toraksta bilateral geniş hiperekojen yapılar ile birlikte fetal asit izlendi. Sonlandırmayı takiben gerçekleştirilen otopsi incelemesinde; akciğerlerde dokularının rastgele dağılmış düzensiz bronşiol benzeri ve genişlemiş alveol benzeri yapılar tarafından oluşturulduğu saptandı.

Sonuç: Nadir bir defekt olan konjenital pulmoner solunum yolu malformasyonu antenatal dönemde tipik görüntüsü ve yol açtığı sistemik değişiklikler ile şüphe uyandırır ve biyopsi-piyes elde edilebilen olgularda histopatolojik tanı gerçekleştirilir.

Anahtar Sözcükler: Konjenital pulmoner solunum yolu malformasyonu, konjenital kistik adenomatoid malformasyon, otopsi.

Introduction

Congenital pulmonary airway malformation has first been described by Chin and Tang in 1949.¹ It is a rare hamartoma of the lungs that occur from unsystematic spread of tubular bronchioles and enlarged alveolar tissue.² Congenital pulmonary airway malformation is mostly diagnosed in neonatal period. More than 90% of these cases have been reported to

be diagnosed in the first two years of life. This malformation can spontaneously regress, increase in size or cause non-immune hydrops fetalis.³ Therefore, the differential diagnosis should be made when echogenic lesions seen in the fetal lung at the prenatal period. Here we present a case of congenital pulmonary airway malformation which definitive diagnosis was made postnatally by autopsy.

Case

Thirty years of age, gravida 5, para 4, abortion 0, live birth 3 case who has married with a relative. Bilateral large thoracic hyperechogenic lesions, fetal abdominal ascites, head and skin edema were observed in prenatal ultrasound at the 23rd week of gestation. The fetus was diagnosed as having non-immune hydrops fetalis (Figure 1). Medical abortion was performed due to family's decision. The APGAR score of the male fetus was 0. Macroscopically, the baby was 1100 gram in weight, 35 cm tall. Laryngotracheal atresia was diagnosed. Placenta was 320 gram in weight and had normal appearance. Both lungs were large and hard. Both lungs were 8x4x3 cm (Figure 2). Autopsy revealed many microcysts (0.1-0.2 mm), randomly spread immature bronchioles and large alveoli in the lung tissue. Microscopically, bronchioles and alveoli like-tissue with many cuboidal epithelial cells in mesenchymal interstitial tissue were seen (Figure 3). The histopathological diagnosis of congenital pulmonary airway malformation type III was made according these findings.

Discussion

Congenital pulmonary airway malformation is a rare hamartomatous lesion of the lung that characterized with abnormal development of alveoli and hyperplastic terminal bronchioles due to abnormal embryogenesis at 6 to 7th

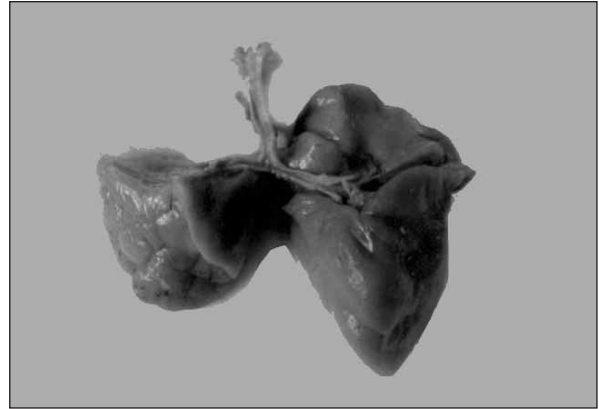


Figure 2. Macroscopic appearance of large lungs.

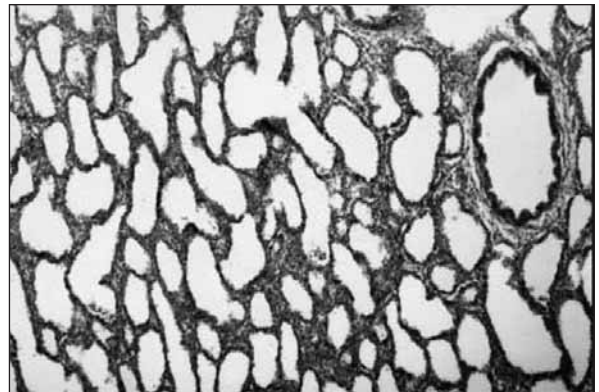


Figure 3. Microscopic appearance of lung tissue.

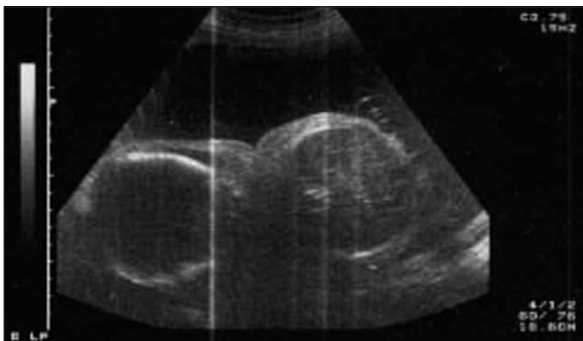


Figure 1. Ultrasonographic appearance.

week of gestation.⁴ It has been reported to be seen in 1 of 25.000-35.000 live births.⁵

Stocker et al has described three different type of congenital cystic adenomatoid malformation of the lung in 1977.⁶ Recently, Stocker has added two more type according to anatomic and microscopic properties of pulmonary airway, and has used congenital pulmonary airway malformation term for this anomaly.⁷ It may be associated with pulmonary hypoplasia, heart failure, polihydramnios, mediastinal shift and particularly non-immune fetal hydrops. However, this lesion may rarely regress spontaneously at prenatal period.⁸ Aksoy et al have described a congenital pulmonary airway malformation case associated with other congenital anomalies.⁹ In our case, we observed non-

immune hydrops associated with the pathology. Recently, prenatal magnetic resonance imaging has been recommended for diagnosis and follows up of these lesions. It is important not only for diagnosis but also for early treatment of such malformations.⁵

Congenital pulmonary airway malformation is characterized with abnormal differentiation of immature bronchioles and abnormal breath pattern during morphogenesis of the lung. The type of these lesions was first described by Chin and Tang in 1949.¹ The types of congenital pulmonary airway malformation:

Type 0: acinary dysplasia - tracheobroncholar origin

Type I: Bronchi/bronchiole originated multiple large cystic type

Type II: Bronchiole originated multiple small cystic type

Type III: Bronchiolw/alveole originated multiple small cystic or solid type

Type IV: Distal acinary originated peripheral cystic type.⁷

Type III is seen in 5% of patients. The majority of type III occurs in boys. Mortality rate is high in type III patients due to polihydramnios and generalized fetal edema. Large parenchymal mass generally is unilateral, located in one lobe of the lung, and cause mediastinal shift and pulmonary hypoplasia. In our case, the lesion was bilateral and located in the whole lung.

Macroscopically, the diameter of cysts is rarely greater than 0.2 mm and bronchi-like large tissue is seen between cysts. These lesions have named as adenomatoid due to their microscopic appearance of unsystematic spread of bronchioles with cuboidal epithelial cells and alveoli-like tissue.¹⁰ Our case had typical properties of type III congenital pulmonary airway malformation.

In conclusion, congenital pulmonary airway malformation is a rare pathology. It should be kept in mind that non-immune hydrops fetalis patients may be associated with congenital pulmonary airway malformation. The differential diagnosis can be done by histopathological evaluation.

References

1. Ch'in KY, Tang MY. Congenital adenomatoid malformation of one lobe of a lung with general anasarca. *Arch Pathol Lab Med* 1949; 48: 221-9.
2. Rajiv C, Dharmendra S, Paras K, Siddharth S, Choudhury SR, et al. Congenital cystic adenomatoid malformation associated with ipsilateral eventration of the diaphragm. *Clin Brief* 2006; 73: 832-4.
3. Janka GE, Schneider EM. Modern management of children with hemophagocytic lymphohistio-cytosis. *Br J Hematol* 2004; 124: 4-14.
4. Kawamura M, Itoh H, Yamada S, Yura S, Katsuya S, Kosaka K, et al. Spontaneous regression of congenital cystic adenomatoid malformation of the lung: Longitudinal examinations by magnetic resonance imaging. *Congenit Anom (Kyoto)* 2005; 45: 157-60.
5. Laberge JM, Flageole H, Pugash D, Khalife S, Blair G, Fliatrault D, et al. Outcome of the prenatally diagnosed congenital cystic adenomatoid lung malformation: A Canadian experience. *Fetal Diagn Ther* 2001; 16: 178-86.
6. Stocker JT, Madewell JE, Drake RM. Congenital cystic adenomatoid malformation of the lung. Classification and morphologic spectrum. *Hum Pathol* 1977; 8: 155-71.
7. Stocker JT. Congenital pulmonary airway malformation: A new name and an expanded classification of congenital cystic adenomatoid malformations of the lung. *Histopathology* 2002; 41: 424-31.
8. De Santis M, Masini L, Noia G, Cavaliere AF, Oliva N, Caruso A. Congenital cystic adenomatoid malformation of the lung: Antenatal ultrasound findings and fetal neonatal outcome. Fifteen years of experience. *Fetal Diagn Ther* 2000; 15: 246-50.
9. Aksoy F, Ramazanoğlu R, Şen C. Congenital cystic adenomatoid malformation type III associated with congenital anomalies. *Perinatoloji Dergisi* 2000; 8: 123-5.
10. Gilbert-Barness E. The respiratory system. In: Gilbert-Barness E (ed). *Potter's Pathology of the Fetus and Infant*. St Louis: Mosby-Year Book; 1997; p.712.

PERINATAL JOURNAL

Volume 15 / Issue 1 / April 2007

Contents

Review	The Role of Neonatal Nurses in Initiating the Mother-Infant Relationship in Premature Infants	1
	Ayşegül İşler	
Research Articles	The Opinion of Health Workers Regarding Vaginal Labor and Cesarean Section	7
	Zeynep Duman, Güleğül Nadirgil Köken, Figen Kır Şahin, Emine Coşar, Dağistan Tolga Ariöz, İlknur Aral	
	Determination of the Median Levels of Triple Test Screening Parameters in Our Region	12
	Nalan Akalın, Serap Arıkan	
	The Role of Ultrasound in Early Pregnancy in Prediction of Miscarriages	20
	Ahmet Jakal, Hüsnü Görgeç, Banu Dane, Cem Dane, Ahmet Çetin, Murat Yayla	
	The Role of the Bishop Score for Successful Labor Induction	26
	Alpaslan Akyol, Özcan Karademir, Ali Gedikbaşı, H. Cemal Ark, Ahmet Güllük	
Case Reports	Aplastic Anemia and Pregnancy: Case Report	35
	Ercan Yılmaz, Ümit Korucuoğlu, Arzu Acar, Nuray Bozkurt, Aydan Biri	
	Celiac Disease and Pregnancy: A Case Report	39
	Tuncay Nas, Ercan Yılmaz, Ümit Korucuoğlu, Pınar Keskin Özcan, Aylar Poyraz, Rifat Gürsoy	
	A Case of Left Isomerism with Hydrops Fetalis: A Case Report	42
	İncim Bezircioğlu, Mine Tunakan, Ali Baloğlu, Burcu Çetinkaya, Merve Biçer	
	Congenital pulmonary airway malformation: Case report	47
	Nihal Kılıç, Abdurrahman Önen, Murat Yayla	