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

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

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Volume 18 / Issue 3 / December 2010

Contents

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LETTER TO EDITOR

Toxoplasma Scanning During Pregnancy

Ercüment Müngen

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Although there are national policies about performing toxoplasma scanning on pregnants or newborns in many countries throughout the world, there is no certain policy of Turkish Ministry of Health. Different centers or physicians get their own way and consequently, management of seropositive cases drift into a complete chaos due to different views and implementations.

There are three types of protective approaches in order to prevent congenital toxoplasma infection. The purpose of primary protection is to prevent maternal infection and to inform and train mother at early pregnancy.[1] Secondary protection aims to decrease infection transition from mother to fetus and to prevent morbidity associated with toxoplasma. Tertiary protection focuses on decreasing the severity of morbidity associated with congenital toxoplasma by postnatal early diagnosis and treatment.[1] Scanning pregnants in terms of toxoplasma seropositivity is included into secondary protection and is implemented as a state policy in countries such as Austria, France, and Brasilia etc. Toxoplasma seropositivity in France is 50% while it is 80-90% in Brasilia. Spiramycine treatment and amniocentesis is applied in cases which have seroconversion during pregnancy and accepted as an acute infection.[1] If fetal infection exist as a result of PCR examination performed on amniocentesis material, pyrimethamine and sulphonamide is administrated as preferred treatment. Termination of pregnancy is generally considered as an option only if fetal anomaly is detected in ultrasonography and family is informed for alternatives. However, there is no certain proofs that infection transition from mother to fetus and perinatal results are recovered by treating pregnants with seroconversion detected during pregnancy.[2,3] Also, there are some problems with kits used in serological scanning of toxoplasma. Most of current Ig M kits have a serious specifity problem and cause high false positivity rates (reaching 6%).[4] In a study researching six different Ig M kits, sensitivity rates were found between 93% and 100% while specifity rates were between 77.5% and 99.1%.5 Although beginning to use PCR method makes fetal diagnosis easy, the sensitivity of this method still stays below 83%.1 While the specifity of PCR is 100% at reference laboratories, lower rates are reported in many other laboratories.1 Another important issue is the requirement to do amniocentesis to cases with seroconversion detected by toxoplasma scanning during pregnancy. There is 0.5% (1 in 200 processes) risk of pregnancy loss in amniocentesis according to current literature. Ig M positivity is detected in 1-5% of patients in toxoplasma scanning. While some of them show acute infection, most of them are false positivity.

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However, acute infection can not be eliminated by methods such as increases in Ig A titer, Ig G-avidity, toxoplasma Ig G titer in some of false positive cases and therefore amniocentesis is tried. However, congenital toxoplasma prevalence is very low and it is reported as 0.73 in Sweden, 0.8 in Massachusetts, less than 1 in England, 2.4 in Finland, and 10 in France in terms of 10,000 live birth.[1,6] Thus, fetus number to be lost in order to detect 1 congenital toxoplasma case will be unacceptably high.[1,7] It is well known that false positive results in toxoplasma scanning, possible negative effects of medical treatment on cases detected fetal infection and uncertainties about prognosis cause serious anxiety on mother and father.[8]

Due to these scientific facts, toxoplasma scanning is not performed during pregnancy today in the USA. Serological examination is performed only in cases detected anomaly via ultrasonography. Scanning performed previously in Switzerland has been terminated recently.[9] ACOG (American College of Obstetricians, Gynecologists) does not recommend routine toxoplasma scanning during pregnancy.[10] RCOG (Royal College of Obstetricians and Gynecologists) states that it is useful to train pregnants about toxoplasma; however RCOG does not recommend routine toxoplasma scanning.[11] CDC (Centers for Disease Control and Prevention) emphasizes the importance of primary protection and recommends to train pregnants and women in reproductive age group about the protection against toxoplasma infection; however CDC does not recommend serological toxoplasma scanning during pregnancy.[4] CDC also states that it would be appropriate to warn pregnants about two issues related wit toxoplasma serological tests: First, no serological test can show the exact time of toxoplasma infection, and secondly, the most positive Ig M results in societies with low toxoplasma prevalence represent false positivity.[4] In our country, toxoplasma serology does not exist among routine tests recommended by Turkish Perinatology Society during pregnancy.

In this issue of Perinatology Journal, there is a study researching toxoplasma seroprevalence of pregnants in Kayseri. This study is important in terms of showing the recent status of toxoplasma prevalence in pregnants in Turkey and it contributes daily obstetric practice by emphasizing the importance of training pregnants about toxoplasma protection. On the other hand, 33.9% seropositivity found in this study is not a high rate in terms of epidemiology. This rate is low according to other studies performed in Turkey. It seems by the studies performed in other European countries that there is a similar decrease in last 2 decades. Therefore, it is not possible to agree the recommendation of authors for doing toxoplasma scanning during pregnancy in terms of the prevalence found not high and other current scientific facts mentioned above.

Consequently, it is important to train pregnants and women planning pregnancy about obeying general hygiene rules and not contacting with cats and cat droppings, eating meat products by cooking well instead of consuming them raw, not touching soil with bare hands and feet and consuming fruits and vegetables by peeling them or cleaning well in order to get protection against congenital toxoplasmosis. Serologic toxoplasma scanning is not recommended in pregnants who are not in the risk group.

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Nomogram of Fetal Cisterna Magna Width at 15-24th Gestational Weeks

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Abstract

Objective: To obtain nomogram of fetal cisterna magna width at 15-24 weeks of gestation with known prognosis of normal pregnancies.

Methods: Cisterna magna width and other routine biometric measurements of 1822 structurally normal fetuses at 15-24 weeks of gestation were measured by transabdominal ultrasonography, prospectively. The distribution of cisterna magna width is established according to gestational weeks and percentiles between 15-24 weeks are calculated. Relationship between cisterna magna width and the other parameters were assessed by regression analysis.

Results: Mean values of cisterna magna width between 15-24 weeks were 3,41±0,82-6,58±1,24 mm respectively. Cisterna magna width is linearely increased between 15-24 weeks. Significant correlation was also found between the cisterna magna width (SMW) and gestational weeks (GH) (SMW=GH x 0.337-1.6203 (r2=0.32; p<0.001)), head circumference (HC) (SMW=HC x 0.0285+0.2137 (r2=0.352; p<0.001)) and biparietal diameter (BPD) (SMW=BPD x 0.1043+0.2681 (r2= 0.336; p<0.001)).

Conclusion: Cisterna magna width showed a linear increase between 15-24 weeks of gestation. Gestational weeks should be taken into consideration during the evaluation of the cisterna magna width and when a value above or below the cut-off is determined, fetal ultrasonographic evaluation must be done systematically.

Keywords: Nomogram of fetal cisterna magna width at 15-24th gestational weeks.

Gebeliğin 15-24 haftalarında sisterna magna genişliğinin nomogramı

Amaç: Prognozu bilinen normal gebeliklerde 15-24. gebelik haftalarında fetüsün sisterna magna genişliğinin nomogramının elde edilmesi.

Yöntem: Bu prospektif çalışmada 15-24. gebelik haftalarında yapısal olarak normal 1822 fetusa ait fetal biyometrik ölçümler transabdominal ultrasonografi ile yapıldı. Bu fetüslerin sisterna magna genişliğinin gebelik haftalarına göre dağılımı çıkarıldı ve 15-24.gebelik haftaları arasında persantil değerleri hesaplandı. Sisterna magna genişliği ile diğer biyometrik parametreler arasında regresyon analizi yapıldı.

Bulgular: 15-24 gebelik haftaları arasında ortalama sisterna magna genişliği (SMG) sırasıyla 3,41±0,82-6,58±1,24 mm arasında tespit edildi. Sisterna magna genişliğinin gebelik haftası (GH) ile ilişkisi incelendiğinde, 15-24 gebelik haftaları arasında lineer olarak arttığı saptandı. Lineer regresyon analizinde; (SMG=GHx0.337-1.6203 (r2=0.32; p<0,001)), baş çevresi (HC) (SMG=HCx0.0285+0.2137 (r2=0.352; p<0.001)) ve bipariyetal çap (BPD) (SMG=BPDx0.1043+0.2681 (r2= 0,336; p<0.001)) arasında anlamlı korelasyon saptandı.

Sonuç: Sisterna magna genişliği 15-24 gebelik haftaları arasında lineer bir artış göstermiştir. Sisterna magna genişliğinin değerlendirilmesinde gebelik haftası göz önünde bulundurulmalı ve uç değerlerin saptanması durumunda fetusta sistematik fetal ultrasonografik inceleme yapılmalıdır.

Anahtar Sözcükler: Sisterna magna genişliği, baş çevresi, gebelik haftası nomogram.

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Introduction

Central nervous system develops from the structure called neural plate which is formed with thickening of ectoderm layer after fifth gestational week. Cisterna magna (cisterna cerebellomedullaris) is one of the enlargements made by subarachnoid interval (in which cerebrospinal fluid circulates) on brain base and it is limited with occipital bone, medulla oblongata and cerebellum.[1-5] While cerebral structures are observed in fetal examinations, it is one of the sonoluscent cavities that should be paid attention and it is observed on third axial plan. Sagittal and coronal plans also should also be examined in their pathologies.[2] It may be confused terminologically with posterior fossa which is between foramen magnum and tentorium cerebelli and includes mid-cerebrum, pons, cerebellum, medulla oblongata and interior surface of occipital bone.[4]

The width of cisterna magna (SMG) is the measurement of the distance between posterior edge of cerebellar vermis and interior surface of occipital bone. Normal width is 2-10 mm.[5] However, cerebellar vermis is not fully developed at second trimester and observing at early weeks may cause to misevaluate normal appearance. Therefore, exact evaluation of cisterna magna and posterior fossa should not be performed before 18th gestational week.[2,6]

Pilu et al. researched posterior fossa structures of 19 fetuses with spina bifida in their prospective study and reported that the diameter of transverse cerebellar was shorter than normal in all cases and cisterna magna was obliterated.[7] The obliteration (<2 mm) or non-appearance of cisterna magna was associated with neural tube defects and Arnold Chiari Type 2 malformation in many studies.[8-14] While mega cisterna magna (>10 mm) can be with structural (Dandy Walker Malformation, arachnoid cyst) or chromosomal anomalies, it also can exist in normal fetuses in an isolated way.[15-19]

In this study, we aimed to obtain the nomogram of SMG in normal pregnancies in our population and to evaluate its relationship with GW (gestational week), BPD (biparietal diameter) and head circumference (HC).

Methods

1822 pregnants chosen prospectively in between 01.01.2006 and 01.01.2010 were included into our study. Our study was formed of single pregnancies between 15th and 24th gestational weeks. Last menstruation date for pregnancy week, head-back distance at first trimester for those with unknown menstruation date or biparietal diameter measurements at second trimester were based on. Those with structural defect or karyotype anomaly, multiple pregnancies, those who gave stillbirth, those with early membrane rupture and intrauterine growth retardation and with systemic disease were excluded from the study.

Ultrasonographic measurements were performed via Voluson 730 (General Electric, USA) ultrasonography device with a transabdominal approach (2-8 MHz) by a single operator. The measurement of SMG was performed by taking the furthest distance between posterior edge of cerebellar vermis and interior surface of occipital surface on suboccipitobregmatic plan where thalamus, cavum septum pellucidum, cerebellum, cisterna magna and nuchal translucency are seen together. Normal SMG is shown in Figure and expanded SMG is shown in Figure 2. Other biometric measurements (BPD, HC) related with the fetus head were completed.

SPSS 11.0 software was used in statistical analyses. SMG was taken as dependent variable in descriptive statistical analyses and linear regression analyses were performed by matching with GW, BPD and HC. The relationship of dependent and independent variables were evaluated by Pearson correlation test. One-way Onova, Post Hoc-Test (Tukey HSD method) analyses were done. Percentile values of SMG

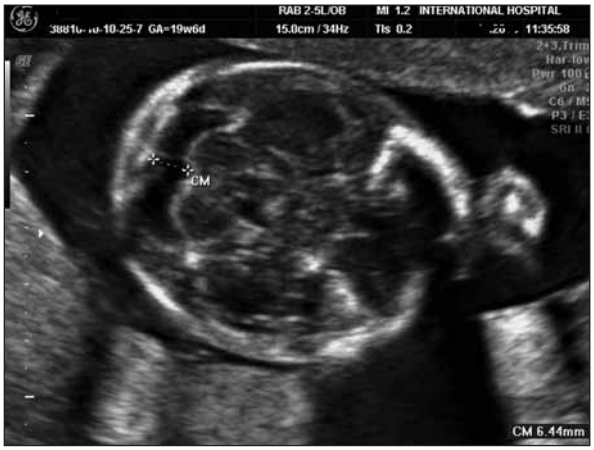

Figure 1. Normal cisterna magna width.

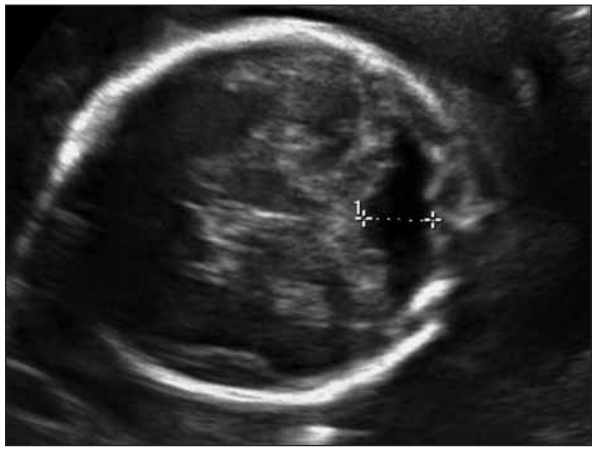

Figure 2. Abnormal cisterna magna width.

according to weeks in between 15th and 24th gestational weeks were calculated. Results were evaluated at $p<0.05$ significance level within 95% confidence interval.

Results

In our study, age range of pregnants complying with research criteria was 19-45 and their mean age was 30.97±4.32. Examined gestational week range was 15-24 and their mean gestational week was 20.96±2.14.

Mean SMG between 15th and 24th gestational week was 3.41±0.82–6.58±1.24, respectively. SMG was found significantly different according to gestational weeks and there is positive correlation with gestational week. SMG measurements according to gestational week at 95% confidence interval are given in Table 1 and the distribution of SMG percentiles according to gestational week is given in Table 2.

Regression equation by linear regression analysis between SMG and GW is given as SMG = GW x 0.337 – 1.6203 ($r2=0.32$; $p<0.001$) (Diagram 1). Regression equation by linear regression analysis between SMG and BPD is given as SMG = BPD x 0.1043 + 0.2681 ($r2=0.336$; $p<0.001$) Regression equation by linear regression analysis between SMG and HC is given as SMG = HC x 0.0285 + 0.2137 ($r2=0.352$; $p<0.001$) (Diagram 2). It is seen that SMG exhibits correlation mostly with HC.

Table 1. Measurement results of cisterna magna width according to gestational week at 95% confidence interval.

GW	N	Average	Std. Dev.	Std. Error	Minimum	Maximum
15	28	3.41	0.82	0.15	2.2	5.1
16	63	3.78	0.83	0.10	2.4	7.1
17	117	4.06	0.74	0.07	2.4	6.5
18	76	4.49	0.92	0.11	2.9	7.3
19	78	4.92	0.92	0.11	3.2	7.5
20	174	5.10	0.91	0.07	3.1	7.9
21	388	5.44	1.05	0.05	2.5	8.7
22	468	5.81	1.11	0.05	3.2	9.5
23	321	6.07	1.19	0.07	3.6	9.4
24	109	6.58	1.24	0.12	3.8	9.5
Total	1822	5.44	1.28	0.03	2.2	9.5

Table 2. Percentile distribution of cisterna magna width according to pregnancy week.

	Percentiles						
Gestational week	**5**	**10**	**25**	**50**	**75**	**90**	**95**
15	2.25	2.39	2.80	3.25	4.00	4.81	5.01
16	2.70	2.74	3.30	3.60	4.10	4.88	5.36
17	3.08	3.20	3.60	3.90	4.40	5.30	5.50
18	3.20	3.40	3.73	4.40	5.10	5.80	6.15
19	3.40	3.79	4.38	4.80	5.50	6.31	6.62
20	3.68	3.90	4.50	5.00	5.73	6.30	6.80
21	4.00	4.20	4.70	5.40	6.18	6.90	7.20
22	4.10	4.40	5.00	5.70	6.60	7.30	7.66
23	4.30	4.60	5.20	6.00	6.80	7.78	8.20
24	4.70	5.00	5.60	6.40	7.45	8.40	8.80

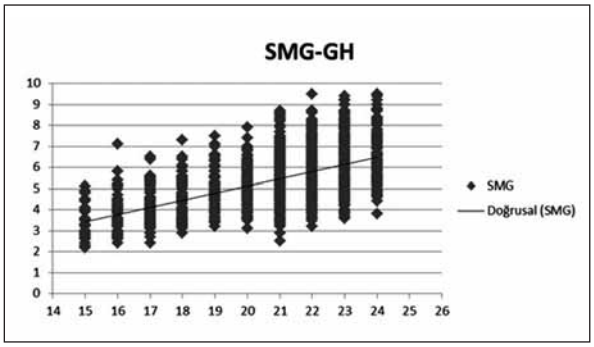

Diagram 1. The distribution of cisterna magna width according to gestational week.

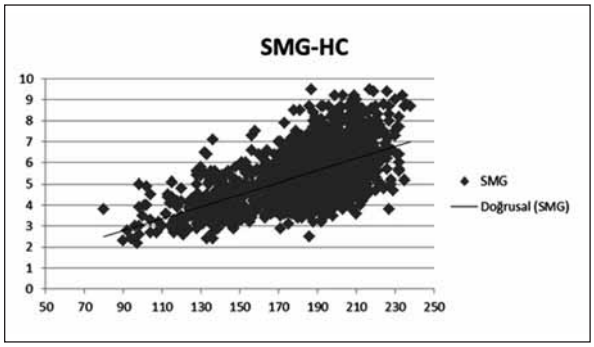

Diagram 2. The distribution of cisterna magna width according to head circumference.

Discussion

It was shown in many studies that the width of cisterna magna increased with gestational week and its normal range was 2-10 mm.[5,11,19-21] Mahony et al. reported SMG in their study as averagely 5±3 mm on 219 pregnants at or after 15th gestational week. They called mega or wide cisterna magna when the width is above 10 mm. Also they reported that isolated wide cisterna magnas are clinically not significant.[5] In our study, we found that SMG increased linearly with gestational week (r2=0.32, P<0.001) and showed significant difference according to gestational week. We found mean SMG as 5.44±1.28 mm.

Haimovici et al. researched prognosis of 15 fetuses of whom isolated wide cisterna magna (11-19 mm) was examined in between 26th and 37th gestational weeks. All of these pregnancies were resulted with normal phenotype newborns and all eight cases which were reached in their long-term (2-69 months) follow-ups were reported as normal.[22] Dror et al. compared 29 fetuses having wide cisterna magna with 35 normal fetuses in terms of their development. When children were evaluated by Gesell Development Schedules and Peabody Developmental Motor Scale, it was reported that study group had a significantly worse performance at Gesell test; however, general performance of both groups was within normal limits. It was reported that walking age was statistically and significantly late in the study group. Consequently, it was emphasized in this study that children with wide cisterna magna

are under risk in terms of slight growth retardation.[23]

Steiger et al. reported that SMG had a better correlation (r2=0.54 P<0.001) during 15th–35th gestational weeks.[18] In our study, we thought that the reason for being weaker of this correlation was gestational weeks we examined which were more limited than those of Steiger et al. Thus, mean cisterna magna widths we found during 15th–24th gestational weeks are similar with the results of the study performed by Steiger et al. (Table 3).

We found in our study that SMG increased with BPD (r2= 0.336) and HC (r2= 0.352) linearly. It was reported in the study of Köktener et al. performed on 194 fetuses between 16th–24th gestational weeks that SMG was in correlation mostly with GW (r2=0.75 P<0.001) and also there was a linear correlation with BPD (r2=0.74 P<0.001).[20] However, this correlation coefficients were very high because of the low number of cases. Also in our study, the correlation of SMG with HC and BPD was found higher than the correlation with gestational week.

No difference was found between the percentile distribution of SMG given in the study of Snijders and Nicolaides[21] with the percentile distribution given in our study (Table 4).

Table 3. The comparison of current study values with the study of Steiger et al.[17]

	Current study		The study of Steiger et al.	
GW	Average	Std. deviation	Average	Std. deviation
15	3.4	0.8	3.3	0.9
16	3.8	0.8	3.7	0.9
17	4.1	0.7	3.8	0.9
18	4.5	0.9	4.6	1.1
19	4.9	0.9	5.1	1.2
20	5.1	0.9	5.5	1.0
21	5.4	1.1	5.5	1.3
22	5.8	1.1	6.2	1.5
23	6.1	1.2	6.4	1.5
24	6.6	1.2	6.2	1.5

Table 4. The comparison of percentile values of current study with the study of Snijdrs et al.[20]

	Percentile values of current study			Percentile values of Snijders and Nicolaides		
GH	5	50	95	5	50	95
15	2.3	3.3	5.0	2.1	3.5	5.3
16	2.7	3.6	5.4	2.4	3.8	5.7
17	3.1	3.9	5.5	2.6	4.1	6
18	3.2	4.4	6.2	2.8	4.3	6.3
19	3.4	4.8	6.6	3.1	4.6	6.6
20	3.7	5.0	6.8	3.3	4.9	7.2
21	4.0	5.4	7.2	3.5	5.1	7.5
22	4.1	5.7	7.7	3.7	5.4	7.7
23	4.3	6.0	8.2	3.9	5.6	8
24	4.7	6.4	8.8	4.1	5.8	8.2

Nicolaides et al. included 70 fetuses into their retrospective study which were established the diagnosis of open spina bifida by ultrasonography during 16th–23rd gestational weeks and they reported that cerebellar hemisphere bent frontward in 12 (57%) of 21 fetuses with suboccipitobregmatic view in cranium and they had also cisterna magna obliteration (banana sign) synchronously.[8] Campbell et al. scanned 436 fetuses who were at high risk in terms of fetal anomaly and 26 of them were established open spina bifida diagnosis, and 16 fetuses (62%) were reported as having banana sign (Chiari II malformation).[9] Goldstein et al. reported in their study that cisterna magna was gone in 18 of 19 case with meningomyelocele of whom posterior fossa could be followed well and one case had very narrowed cisterna magna. Also they were reported that cisterna magna was gone in 5 of 13 cases with isolated Ventriculomegaly of whom posterior fossa could be followed well.[11]

Ghi et al. followed up 57 of 66 fetuses that they diagnoses as spina bifida during 16th–34th gestational weeks and defined 93% of these cases as open defect and 7% of them as closed defect. During mid-gestation, they always found open defect cases with banana sign and lemon sign. However, they detected ventriculomegaly only in 64.2% of cases with open defect. They reported that intracranial anatomy was normal in those with closed defect diagnosed lately.13 Güven et al. found in their study that there was enlarged cisterna magna in 60% of cases (3/5) with Dandy-Walker malformation and in 13% of cases (1/3) with Dandy-Walker variant.[15] It was reported in the study of Filly et al. that brain and spinal cord anomaly risk was 0.005% in fetuses who had normal cisterna magna and lateral ventricle.[10]

Nyberg et al. evaluated 33 fetuses with wide cisterna magna in their study in terms of chromosomal anomaly and found normal karyotype in 15 fetuses and chromosomal anomaly in 18 fetuses. 12 of chromosomal anomalies were reported as Trisomia 18, 3 of them as Trisomia 13, one of them as 45 X0, one of them as 46 XX t(21q) and one of them as 46,XY del(6 q25). Also it was reported that there was an advanced correlation between wide chromosomal anomalies and wide cisterna magnas which were not accompanied by Ventriculomegaly.[17]

Steiger et al. stated in their study that the sensitivity of +2.5 SD value of SMG was low for Trisomia 18.18 It was reported in the study performed by Watson et al. that SMG measurement during 14th–21st gestational weeks was not helpful for scanning chromosomal anomalies.[19]

Conclusion

Consequently, cisterna magna width exhibits a linear increase in between 15th and 24th gestational weeks. This increase is closely associated with BPD and especially HC. Evaluating the width of cisterna magna may enable to establish early diagnosis of defects and anomalies which may exist in posterior fossa and adjacent organs. Gestational week should be considered while performing this evaluation and systematic ultrasonographic examination should be done on fetus if extreme values are detected.

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The Ratio of Biparietal Diameter to Nasal Bone Length

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Abstract

Objective: The aim of this study was to determine the relationship between the ratio of biparietal diameter to nasal bone length and gestational weeks at the second trimester of pregnancy.

Methods: We evaluated consecutively fetuses referred to our facility between 15 and 22 weeks' gestation for perinatal sonography and amniocentesis because of an increased risk of aneuploidy. Anatomically normal and euploid 505 fetuses were included in the study. A detailed structural survey, biometric measurements, and measurement of the nasal bone were obtained before the amniocentesis procedure. The distribution of fetal nasal bone length between 15-22 gestational weeks was established and their percentiles were calculated. The ratio of biparietal diameter to nasal bone length was calculated for each case.

Results: The mean nasal bone length for 15 to 22 week`s gestation was 3.21±0.41, 3.45±0.52, 3.81±0.58, 4.17±0.68, 4.42±0.66, 4.89±0.89, 5.35±0.90 and 5.84±1.02 mm respectively. A significant positive correlation was also found between the nasal bone length and the gestational week (Nasal bone length = -2.485+0.370xGestational week (r2=0.50; p<0.001)). The mean biparietal diameter/nasal bone length ratio was 9.94±1.56 and did not progressively increase with advancing gestational age.

Conclusion: The ratio of biparietal diameter to nasal bone length remained constant at 15-22 gestational weeks.

Keywords: Nasal bone length, gestational week, the ratio of biparietal diameter to nasal bone length.

Bipariyetal çapın burun kemiği uzunluğuna oranı

Amaç: Çalışmamızda gebeliğin ikinci trimesterinde bipariyetal çapın burun kemiği uzunluğuna oranının gebelik haftası ile ilişkisini değerlendirmeyi amaçladık.

Yöntem: Gebeliğin 15-22 haftaları arasında perinatal ultrasonografi ve amniosentez için sevk edilen normal kartyotipli ve anomalisi olmayan 505 fetus çalışmaya dahil edildi. Fetal biyometri ve burun kemiği ölçümleri amniosentez işlemi öncesinde elde edildi. Ölçümlerle birlikte fetal yapılar ayrıntılı olarak değerlendirildi. Burun kemiği uzunluğunun 15-22 gebelik haftaları arasında dağılımı ve yüzdelik değerleri çıkarıldı. Her fetus için bipariyetal çapın burun kemiği uzunluğuna oranı bulunarak gebelik haftası ile olan ilişkisi değerlendirildi.

Bulgular: Gebeliğin 15-22 haftaları arasında ortalama burun kemiği uzunluğu sırasıyla 3.21±0.41, 3.45±0.52, 3.81±0.58, 4.17±0.68, 4.42±0.66, 4.89±0.89, 5.35±0.90 ve 5.84±1.02 mm olarak saptandı. Burun kemiği uzunluğunun gebelik haftası ile birlikte lineer olarak arttığı ve bu korelasyonun anlamlı olduğu bulundu. Burun kemiği uzunluğu ile gebelik haftası arasındaki lineer regresyon analizi ile regresyon denklemi şu şekilde oluşturuldu: Burun kemiği uzunluğu = -2.485+0.370xGebelik haftası (r2=0.50; p<0.001). Fakat gebelik haftaları ile bipariyetal çapın burun kemiği uzunluğuna oranının anlamlı olarak değişmediği (p>0.05) ve bipariyetal çapın burun kemiği uzunluğuna oranının ortalama 9.94±1.56 olduğu bulundu.

Sonuç: Bipariyetal çapın burun kemiği uzunluğuna oranı gebeliğin 15-22 haftaları arasında sabit değer göstermektedir.

Anahtar Sözcükler: Burun kemiği uzunluğu, gebelik haftası, bipariyetal çapın burun kemiği uzunluğuna oranı.

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Introduction

Nasal bone begins to develop as two separate structures from neural crest cells at sixth gestational week. Both structures ossify through intramembranous ossification. It can be seen by ultrasonography after the 10th gestational week.[1,2] The experience of physician using ultrasonography, device quality, the appropriateness of the plan examined, oligohydramnios, obesity, fetus position and gestational week may affect examination quality.[3]

It was shown in previous studies that detecting non-existence or hypoplasia of nasal bone is an effective method for scanning chromosomal anomalies.[4,5] Langdon Down stated in 1866 that nasal bone shortness is a common characteristics of patients with Trisomia 21 and then this syndrome is named after him later.[6] It was reported that 60% of fetuses with non-existence or hypoplasia of nasal bone in between 14th and 25th gestational weeks had Trisomia 21 and that the rate of hypoplasia occurrence in those with euploid was 1.4%.[2] Cicero et al. defined in their studies performed on 1046 pregnants between 15th and 22nd gestational week that the nasal bone hypoplasia is the nasal bone length (NBL) below 2.5 mm. Nasal bone hypoplasia rates were 61.8% in fetuses with Trisomia, 3.3% in fetuses with chromosomal anomalies and 1.2% in normal fetuses.[7] Bunduki et al. reported in their study performed on pregnants between 16th and 24th gestational weeks that nasal bone hypoplasia is the NBL below 5th percentile and specified the sensitivity for Trisomia 21 as 59.1%.[8]

Determining non-existence or hypoplasia of nasal bone is accepted as an effective method today for scanning chromosomal anomalies. While it is required to know nasal bone lengths as to weeks in order to detect nasal hypoplasia, other non-changing rates supporting this finding are also required.[4]

In this study, nasal bone length and the change of rate of biparietal diameter to nasal bone length (BPD/NBL) according to gestational week for fetuses with normal karyotype and no anomaly were researched and the relationship between them were analyzed.

Method

The study was performed on 584 pregnants who were examined by perinatal ultrasonography and than had karyotype analysis in between 01.01.2006 and 01.07.2010. Last menstruation date for pregnancy week, head-back distance at first trimester for those with unknown menstruation date or biparietal diameter measurements at second trimester were based on. Those with structural defect or karyotype anomaly, multiple pregnancies, those who gave stillbirth, those with early membrane rupture and intrauterine growth retardation and with systemic disease were excluded from the study. The study group was formed of 505 single pregnancies with normal karyotype analysis and not having congenital anomaly that were chosen prospectively in between their 15th and 22nd gestational weeks. 79 pregnancies were excluded from the study. The reason for excluding them was that structural anomaly was found in 34 of these pregnancies, chromosomal anomaly was found in 33 of them (also there was structural anomaly in 12 fetuses) and missed abortus found in one of them, and also five pregnants due to systemic diseases were excluded from the study and six pregnants due to not having follow-up.

Ultrasonographic measurements were performed via General Electric Voluson 730 (USA) ultrasonography device with a transabdominal approach (2-7 MHz) by a single operator. Biometric evaluation of the fetus was performed. Fetal biometry and nasal bone measurements were obtained before amniocentesis. BPD measurement was performed by taking the distance from posterior edge of frontal parietal bone to interior surface of posterior parietal bone on cranium axial plan where thalamus, cavum septum pellucidum and third ventricle are seen together. Nasal bone was imaged

with low brightness adjustment and 45 or 135 degree angle within the area where maxilla and frontal bone are limited in the plan where jaw and lips of fetus are displayed on midsagittal facial profile. Measurements were done as the maximum length between upmost and lowermost ends of nasal bone. The average value was obtained by performing these measurements twice. BPD/NBL rate was calculated for each fetus. Lengths and rates were compared with gestational week.

Patient data were analyzed by SPSS 11.5 software (SPSS Inc., Chicago, IL, USA). Pearson Correlation test, Regression analyzes and descriptive statistical analyses were performed. One-way variance analysis (One-way Anova) and Post Hoc comparison test were performed by Tukey's HSD method. Results were evaluated at $p<0.05$ significance level within 95% confidence interval.

Results

505 pregnants complying with research criteria were included into our study. Age range of these pregnants was 18-47, and the mean age was 34.41±5.10. Gestational week range was 15-22 for the study, and mean gestation week was found as 17.84±1.80. Mean NBL was 4.12±0.94 mm and BPD was 39.93±5.94 mm.

It was found in our study that NBL increased linearly with gestational week (GW) and this correlation was significant. The regression equation between NBL and GW was found as NBL = -2.485 + 0.370 x GW ($r2=0.50$; $p<0.001$) by linear regression analysis (Diagram 1). NBL

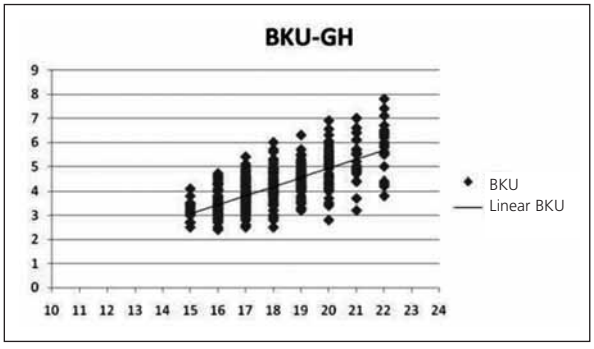

Diagram 1. Nasal bone length according to gestational week.

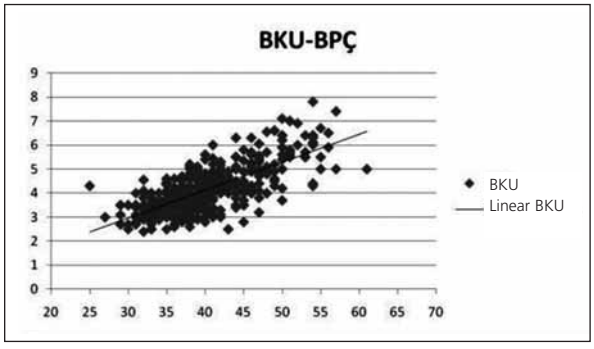

Diagram 2. Nasal bone length according to biparietal diameter.

Table 1. NBL measurements according to gestational week within 95% confidence interval.

				At 95% confidence interval				
GW	**N**	**Average**	**Std. Dev.**	**Std. Error**	**Lower limit**	**Upper limit**	**Minimum**	**Maximum**
15	21	3.21	0.41	0.09	3.01	3.39	2.5	4.1
16	104	3.45	0.52	0.05	3.35	3.56	2.4	4.7
17	141	3.81	0.58	0.05	3.71	3.91	2.5	5.4
18	84	4.17	0.68	0.08	4.03	4.32	2.5	6.0
19	58	4.42	0.66	0.09	4.25	4.59	3.2	6.3
20	43	4.89	0.89	0.14	4.62	5.17	2.8	6.9
21	31	5.35	0.90	0.16	5.02	5.68	3.2	7.0
22	23	5.84	1.02	0.21	5.40	6.28	3.8	7.8
Total	505	4.12	0.94	0.04	4.04	4.20	2.4	7.8

Table 2. NBL distribution according to gestational week.

GW	Percentiles		
	5	50	95
15	2.5	3.2	4.1
16	2.7	3.4	4.4
17	3.0	3.8	4.8
18	3.0	4.2	5.3
19	3.3	4.4	5.5
20	3.4	5.0	6.5
21	3.5	5.2	7.0
22	3.9	5.9	7.7

measurements according to gestational week within 95% confidence interval are given in Table 1 and percentile distributions are given in Table 2. The regression equation between NBL and BPD was found as NBL = -0.529 + 0.116 x BPD (r2=0.54; p<0.001) by linear regression analysis (Diagram 2). It was seen that nasal bone length displayed most correlation with BPD in between 15th and 22nd gestational weeks.

It was observed in our study that nasal bone length displayed diversity significantly among groups formed according to the gestational weeks. However, BPD/NBL rate did not change significantly (P>0.05) and mean BPD/NBL rate was 9.94±1.56 (Diagram 3). When 11, 12 and 13 were taken as the limit value of BPD/NBL for scanning, false positivity rates were found as 21.8%, 10.5% and 4.2%, respectively.

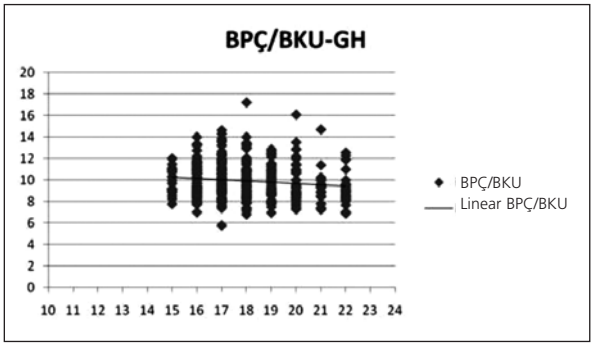

Diagram 3. The relationship of BPD/NBL rate with gestational week.

Discussion

In our study, it was found that nasal bone length increases linearly with gestational week (r2=0.50) and it was averagely 4.12±0.94 mm. Guis et al. reported in their study that mean nasal bone length was between 4 and 12 mm and it displayed an increase linear with gestational week (r2=0.68).9 Sonek et al. measured nasal bone length in 3537 pregnancies in between 11th and 40th gestational weeks and reported that this length displayed a positive correlation with gestational week (r2=0.77).[10] Bunduki et al. found mean nasal bone length as 6.9±1.29 mm in their study performed on 1631 fetuses between 16th and 24th gestational weeks and stated that there was a linear increase with gestational week.8 Yayla et al., Naraphut et al., and Sutthibenjakul et al. reported that nasal bone length increased linearly with gestational week.[3,11,12]

The relation level between NBL and GW (r2=0,43) found in the study of by Jung et al. on 3019 fetuses in between 16th and 28th gestational week was similar to our study.[13] Nasal bone length was shorter in our study than found in other national studies. It is considered that this is caused by high risky pregnancies forming the study group, and technical, ethnical and racial differences (Table 3). In fact, Zelop et al. reported that nasal bone length may vary among ethnical origin and races.[14] Also we could not compare properly the studies of Yayla et al. and Yalınkaya et al. performed on NBL in our study.[3,15] The reason was that both study groups (polyclinic patients without karyotype anomaly risk) and studied gestational weeks (11-39 GW) and (11-41 GW) were different and mean NBL and percentile values according to gestational weeks were not analyzed in these studies.

Bromley et al. measured nasal bone length of 239 fetuses with high risk in between 15th and 20th gestational week and found that the rate of BPD/NBL did not change with gestational week and only one limit value could be used.

Table 3. 5th percentile values of current study and other studies between 15th and 22nd GW.

	5th Percentile NBL				
GW	**Bundaki et al.[7]**	**Sonek et al.[10]**	**Naraphut et al.[11]**	**Sutthibenjakul et al.[12]**	**Current study**
15	-	3.0	2.6	2.5	2.5
16	4.1	3.4	3.0	3.0	2.7
17	4.3	4.0	3.4	3.3	3.0
18	4.6	4.3	3.7	3.6	3.0
19	4.9	5.0	4.1	4.2	3.3
20	5.2	5.2	4.5	4.8	3.4
21	5.4	5.6	4.9	5.7	3.6
22	5.7	5.8	5.3	6.1	3.9

Mean BPD/NBL rate in fetuses with normal karyotype was reported as 8.1±1.4 while it was 11.3±2.0 in fetuses with Trisomia 21 and the difference was significant. Also, it was reported that false positivity rates were 22%, 11.5% and %2 respectively when BPD/NBL rates were 9, 10, 11 and 12.[4] Obido et al. found the sensitivity of scanning Down syndrome as 59% and false positivity as 15% when BPD/NBL rate was ≥11.[16] Tran et al. also stated that BPD/NBL rate was a significant and independent marker for Down syndrome.[17] In our study, we found mean BPD/NBL rate as 9.94±1.56 and that it was not changing with gestational week similar to other studies. When BPD/NBL limit value for scanning was taken 11, 12, and 13, false positivity rate was found as 21.8%, 10.5% and 4.2% and these rates were found high according to the literature.

Conclusion

Consequently, we found in our study that nasal bone length increased linearly with gestational week. However, we found that BPD/NBL rate was not changing with gestational week and this rate was 9.9±1.5. We observed that it could be pathological with 4% false positivity when BPD/NBL rate was 13 and above. We considered that fetuses might need more advanced analyses in diagnosis with this measurement and above, and the diagnoses in cases with anomaly should be compared with current diagnoses in order to do that and secondary studies are needed to examine them, and the related rate could be used securely only by these studies.

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Turkish Demographic and Health Survey Results of Antenatal Care, Perinatal Fetal and Neonatal Evaluation With Respect to Prognosis

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Abstract

Objective: Turkey Demographic Health Surveys data, which was completed in 2008 was analyzed. Examination of the fetus and newborn outcome of pregnancies, use of antenatal care services and to evaluate the effect on the results of antenatal care services.

Methods: Turkey Demographic Health Surveys data, which was completed in 2008 by the Ministry of Health, Hacettepe University Institute of Population Studies and Macro International was analyzed.

Results: The results of the survey data and questioning the general population has been reached adjusting the following comments: 1) Only 78.4%of pregnancies ends with a live birth in Turkey 2) Pregnancies can not end live births consist of spontaneous abortions rate is 49%, induced abortions rate is 46%and stillbirths rate is 5%. 3) Receiving prenatal care in health care workers and health facility to perform the birth rate reached over 90% 4) Remarkable increase in cesarean section rates. 5) Although antenatal care services increased neonatal mortality reduction should be to question the quality of service became clear that this is not satisfactory.

Conclusion: Our country is trying to reach with the relevant health data, two points come to our attention. The first is the absence of a registry system in our country healthy for the fetus and newborn, and the second each year about 300 thousand babies died before birth or the neonatal period with the main responsibility for the quality of antenatal care services across the country, is that still inadequate. Solution to these problems, emphasis will be given again, recording systems and improving the quality of antenatal care services passes.

Keywords: Turkey, antenatal care, caesarean section rate.

Türkiye nüfus ve sağlık araştırması sonuçlarının antenatal bakım, fetal perinatal ve neonatal prognoz yönünden irdelenmesi

Amaç: İkibinsekiz yılında tamamlanmış olan Türkiye Nüfus Sağlık Araştırmaları'na ait veriler ile gebeliklerin fetus ve yenidoğan akıbeti yönünden incelenmesi, antenatal bakım hizmetlerinden yararlanma ve antenatal bakım hizmetinin elde edilen sonuçlar üzerindeki etkisinin değerlendirilmesi.

Yöntem: Sağlık Bakanlığı, Hacettepe Üniversitesi Nüfus Etütleri Enstitüsü ve Macro International tarafından 2008 yılında tamamlanmış olan Türkiye Nüfus Sağlık Araştırmaları'na ait veriler incelendi.

Bulgular: Anket ve sorgulama verilerinin sonuçları toplum geneline uyarlandığında aşağıdaki yorumlara ulaşıldı: 1. Türkiye'de gebeliklerin sadece %78.4'ü canlı doğum ile sonlanmaktadır, 2. Canlı doğumla sonlanmayan gebeliklerin %49'u istemsiz düşükler, %46'sı istemli düşükler, %5'i ise ölü doğumlardan oluşmaktadır, 3. Sağlık personelinde doğum öncesi bakım alma ve doğumu sağlık kuruluşunda gerçekleştirme oranı %90'ların üzerine çıkmıştır, 4. Sezaryen oranlarındaki artış dikkat çekicidir. 5. Antenatal bakım hizmeti arttığı halde neonatal mortalitedeki azalmanın tatminkar olmaması bu hizmetin kalitesini sorgulamamız gerektiğini ortaya çıkartmıştır.

Sonuç: Ülkemiz ile ilgili sağlık verilerine ulaşmaya çalışırken iki nokta dikkatimizi çekmiştir. Bunlardan birincisi ülkemizde fetus ve yenidoğan ile ilgili sağlıklı kayıt sisteminin bulunmadığı, ikincisi ise her yıl doğumdan önce veya yenidoğan döneminde kaybedilen yaklaşık 300 bin bebeğin asıl sorumluluğunu taşıyan antenatal bakım hizmetlerinin ülke genelindeki kalitesinin hala yetersiz olduğudur. Bu sorunların çözümü, yine kayıt sistemlerine verilecek önem ve antenatal bakım hizmetlerinin kalitesinin yükseltilmesinden geçmektedir.

Anahtar Sözcükler: Türkiye, antenatal bakım, sezaryen oranı.

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Introduction

The level of baby and child deaths generally reflects the level of health service and general living conditions in a society. Although these services and conditions are separated into two groups as prenatal and postnatal, they are the components forming a whole. It is an expected from a service given prenatally to affect also the postnatal period.[1]

According to 2008 data of Turkish Demographic and Health Survey (TNSA), stillbirth rate is 7/1000, early neonatal death rate is 11/1000, perinatal death rate is 19/10000 and death rate within first month after delivery is 13/1000. Among these deaths, 17% is stillbirth, 32% is neonatal death, 10% is postneonatal death and 41% is baby death. Also, the progress of baby mortality in the last decade is in the range of 29-17/1000. To express these rates in numerical way, we can say that we lose approximately 14000 babies in the first month after delivery every year and we lose 20000 – 25000 babies in the first year after delivery.

On the other hand, according to TNSA 2008 results, it was shown that 22 of each 100 pregnancies in Turkey did not result with viable birth in the last five years. In Turkey, according to the information that there were 1.262.333 deliveries in 20082, approximately 356.000 pregnancies were resulted with spontaneous abortion or stillbirth every year. By excluding 49% of abortions which are "induced abortions", we can estimate that approximately 180.000 of pregnancies are resulted with loss.

Our aim in this study is to analyze pregnancies in our country in terms of fetus, newborn and baby outcomes in parallel with Turkish Demographic and Health Survey and to emphasize positive and negative points.

Methods

The data of Turkish Demographic and Health Surveys (TNSA) completed in 2008 by Turkish Ministry of Health, Population Etudes Institute of Hacettepe University and Macro International were analyzed.

1998, 2003 and 2008 Guides of Turkish Demographic and Health Surveys were used in order to reach the data related with pregnancies and their outcomes in Turkey. Approximately 10000 households and 7500 married women were interviewed by all three surveys and data were obtained with 5% error margin enabling us to generalize the society and these results were confirmed by next researches.

Results

Abortions

According to the 2008 data of Turkish Statistics Institute, there were 1.262.333 deliveries in 2008 in Turkey. This number constitutes approximately three fourths of all pregnancies. Short-term outcomes of pregnancies are given in Table 1.

Table 1. Gestational prognosis.*

TNSA	1993-1998	1998-2003	2003-2008
Induced abortion	14.5	11.3	10.0
Spontaneous abortion	8.7	10.0	10.5
Stillbirth	1.5	1.3	1.1
Live birth	75.3	77.4	78.4

** Rates are given as percentage.*

As noticed, spontaneous abortion rate in 2008 is 10.5%. When the data of TNSA 2003 and TNSA 2008 are compared, it is seen that the rate of induced abortion decreases 11% and the rate of spontaneous abortion increases 5%. When all married women (age 15-49) are considered according to the data of last 5 years, the rate of women who had induced abortion is 22%, the rate of women who had spontaneous abortion is 20% and the rate of those with stillbirth is 4%. 6% of all married women had induced abortion, 8% of them had abortion more than once and less than 1% of them had pregnancy more than once which resulted with stillbirth.

The point standing out here is that the outcomes obtained from family planning methods for years are actually disputable. While 34% of women did not use any method before induced abortion, 22% of them used a modern contraceptive method (11% condom, 5% pills, 5% RIA) and 44% of them used traditional methods such as using calendar and withdrawal method. None-use of any method by 32% of women and use of withdrawal method by 22% of women during the first month after induced abortion emphasize the requirement of giving consultancy for family planning after induced abortion.

15% of pregnancies according to 1998 data, 11% of pregnancies according to 2003 data and 10% of pregnancies according to 2008 data are ended with induced abortion. As it is understood here, over 180.000 pregnancies are ended with induced abortion every year and it is a high rate when compared with general delivery number. The distribution of these induced abortion over gestational months are given in Table 2.

Table 2. Gestational months in induced abortions.*

TNSA	1998	2003	2008
1st month	68	73	67
2nd month	23	22	22
3+ month	9	5	11

**Rates are given as percentages.*

Prenatal Care and Neonatal Postneonatal Mortality

When antenatal care and getting support for delivery are compared with mortality rates in TNSA 1998 data, a difference drawn attention in terms of neonatal mortality (neonatal mortality rate of those who got antenatal care was 23/1000 and it was 37/1000 for those who did not get antenatal care); and this was detected more clearly in postneonatal mortality (postneonatal mortality rate was 5/1000 for those who got antenatal care and it was 58/1000 for those who did not get antenatal care). When the rates and outcomes of getting care compared to previous years are interpreted, a clear decrease is observed in mortality for those who get full care.1 Existence of relationship between neonatal mortality and antenatal care services required to question antenatal care service and it is seen that TNSA 2003 and 2008 gave more detailed data for antenatal care services.

According to TNSA 2008 data, 90% of women took prenatal care from at least one physician (totally 92% of them from health personnel) during their last deliveries within last five years before the survey date. When TNSA-1998 and TNSA-2008 results are compared, the rate of getting prenatal care was increased from 68% to 92% (Table 5). This indicates approximately 75% decrease in the rate of women who did not get any prenatal care.

The rate of getting antenatal care is high in young women (93%), in those pregnant for their first children (98%), and those living in urban areas. Prenatal care is at the lowest rates in Northeast, Middle-east and Southeast Anatolia (73%, 76% and 82%, respectively).

Initiating prenatal care at the early periods of pregnancy is useful and effective on preventing pregnancy to result negatively. When 1998 and 2008 data in the Table are compared, it is seen that women are more aware of the importance of getting prenatal care. First visit median value which was 3.1 months in 1998 reduced to 2.8 months in 2003 and reduced to 2.2 months in 2008.

Table 3. Stillbirth rates during reproductive periods of married women.

TNSA	1993	1998	2003	2008
Total	5.7	5.0	4.0	4.0
1 stillbirth		4.3	3.5	3.5
2 stillbirths		0.5	0.3	0.4
3 and more stillbirths		0.2	0.2	0.1

Table 4. Stillbirth number per 100 pregnancies.

TNSA	1993	1998	2003	2008
	1.9	1.5	1.3	1.1

Gestational complications are the most important reasons for maternal deaths, early neonatal deaths and morbidity. Therefore, effective prenatal care for providing safe maternity depends on tests and measurements performed in order to determine possible complications during these controls. It is seen that 92% of women's blood pressure was measured who got prenatal care, 82% of them had urine test, 86% of them had blood analysis, 96% of them had ultrasonographic analysis at least one of their prenatal visits and 83% of them had weight measurement. It was also found that fundus pubis examination performed during prenatal care had a low rate (74%). 80% of pregnants stated that they used iron supplements. As seen in Table 6, fundus pubis examination rate given in TNSA-2008 data increased significantly though it is still at the lowest rate compared to other examinations and measurements.

While the rate of delivery performed in a health organization was 78% according to the date of TNSA-2003, it was found as 90% throughout the country according to TNSA-2008. Women who got prenatal delivery four or more times had 97% of their deliveries in a health organization. In case that prenatal care was not taken, the rate of performing delivery at home is 34%. While delivery rate in a health organization is 80% in rural areas, it is 94% in urban areas. The rate of deliveries performed in a health organization is above the country average in all regions except Eastern region (72%). Middle Anatolia region has the highest rate (98%) in terms of deliveries performed in a health organization followed by Western and Northern regions (96%).

Getting help from trained health personnel during delivery has a major importance in terms of preventing maternal deaths and neonatal deaths. While the rate of all deliveries within last five years performed by getting trained health personnel was 83% in TNSA-2003, it was 91% in TNSA 2008.

Delivery by Cesarean

Delivery by cesarean is quite common in Turkey. According to TNSA 2008 data, 37% of all deliveries done in the last five years were done by cesarean. The rate of delivery by cesarean increased largely (21%) according to TNSA-2003. Another point found significant in the data is that the rate of cesarean at first delivery increased more than 100% as to 1998. 45% of first deliveries were done by cesarean (Table 7). Cesarean is more common among women living in urban areas (42%) compared to

Table 5. The rates of getting antenatal care.*

	1998	2003	2008
**Getting antenatal care	68	81	92
*Getting antenatal care from physician	60	71	90
*Care before 6th month of pregnancy	60	71	87
*Median pregnancy duration at first visit	3.1 months	2.8 months	2.2 months
*Getting antenatal care more than four times	42	54	74
*In urban areas	?	64	80
*In rural areas	?	33	55

** Rates are given as percentage.*

women living in rural areas (24%). Deliveries by cesarean are over 40% in all regions except Eastern Anatolia (16%). Cesarean rates increase as education and welfare levels increase.

Table 6. Rates of tests and measurements performed during prenatal care.*

	2003	2008
Blood pressure measurement	89	92
Fundus pubis examination	46	73
Ultrasonographic examination	90	96
Urine test	73	82
Blood test	77	86

** Rates are given as percentage.*

Table 7. Rates of deliveries by cesarean.*

TNSA	1993	1998	2003	2008
The rate of delivery by cesarean	7	14	21	37
The rate of cesarean at first delivery		20	30	45

** Rates are given as percentage.*

It is clear that getting antenatal care, performing delivery at a health organization and getting help from trained health personnel during delivery has a significant contribution on the decrease of the rates of perinatal, neonatal and postneonatal death though there is no direct explicative data in TNSA-2008. There is need for studies explaining relationship between these parameters and neonatal and postneonatal death rates in next TNSA.

Neonatal mortality decreased from 40/1000 to 13/1000 and postneonatal mortality decreased from 5/1000 to 4/1000 in last 30 years. Stillbirth and early neonatal death numbers and perinatal death rates are given in Table 8 for the five years before TNSA-2008 according to some basic demographic and socio-economical variables. When the rate 24/1000 given in TNSA-2003 is considered, it is seen that there is a decrease in perinatal death rate in last five years.

Table 8. Intervals of postnatal death rates according to years.*

	Neonatal mortality	Postneonatal mortality	Baby mortality
1978-1982	37-42	54-58	92-100
1983-1988	35-45	37-47	70-81
1988-1993	29-30	23-24	53-54
1993-1998	26	17	43
1998-2003	17	12	29
2003-2008	13	4	1

** Rates are given as percentage.*

It is seen that perinatal death rate is quite high among women in 40-49 age group and women younger than 20 years old. There is a strong relationship between pregnancies occurring with short intervals and perinatal death rate. Perinatal death rates in pregnancies occurring in intervals shorter then fifteen months are two times higher than pregnancies occurring in intervals of 15-26 and 27-38 months. Perinatal deaths in urban areas are higher than rural areas. It is seen that the Western region has the highest perinatal death rate among all regions. This conflicting highness in perinatal death rate in Western region may caused by ending abnormal fetuses by establishing intrauterine diagnosis. Women with high education level have less perinatal death experience than educated women. Perinatal death rate in houses with low welfare level is higher than others. When considered according to regions, neonatal and postneonatal death rates are low in western regions while it is at the highest rates in Eastern and Southern regions.

Discussion

It is reported that approximate delivery in our country is 1.262.333 in a year.[3] While the delivery number in İstanbul according to 1999 was 153.000, it increased to 212.000 in 2008 and baby death rate decreased from 25/1000 to 10.7/1000. Induced abortion rate was found as 29/1000 in Turkey while it was 42/1000 in İstan-

bul.[5] Getting help from health personnel before and during delivery developed in recent years and 92% of women in Turkey got antenatal care service from health personnel while this rate increased to 97% for women living in Western regions. The rate of getting antenatal care was 68% in TNSA-2003 data and it increased to 92% according to 2008 data. The rate of delivery performed in a health organization was 78% according to TNSA-2003 data while it increased to 90% throughout the country according to TNSA-2008 data. Despite the increase in the rate of antenatal care, rate difference between urban and rural, east and west still continues. Getting help before and/or during delivery is still behind the desired level though it has a developing progress which has a positive effect on data related with baby death rates. It is emphasized that 65% of antenatal deaths and 78% of early neonatal deaths can be prevented under hospital conditions.[6] In fact, the decrease obtained for postneonatal mortality in Turkey has a visible rate. However, it is hard to say same for neonatal mortality. When TNSA-2008 data are compared with 2003 data, it is seen that there is 67% decrease in postneonatal mortality while the decrease in neonatal mortality stayed at 24%. There may be two explanations that neonatal mortality rate does not change much by antenatal care and getting delivery help: either mortality has reached a level which can not be reduced anymore or the service given is insufficient. The quality of antenatal care service which reached the rate of 92% in Turkey should be questioned.

According to TNSA 2008 results, pregnancies below age 20 and above age 40, short delivery interval, low welfare level and low education level, high parity and low weighted baby birth affect mortality rate negatively. It is interesting that perinatal mortality rate is 20/1000 in urban areas while it is 17/1000 in rural areas. Among all regions, Western region has the highest perinatal death as 25/1000. While the rate of getting antenatal care is 96% in western regions and it is 79% in eastern regions, these data seem inconsistent. It can be considered that this difference might be created by risks which may be brought by urban life (accident, bad habits, heavy work life etc.) and early diagnosis factor (early diagnosis of anomalies and abortion etc.) in care services.

Approximately one third of reasons of newborn mortalities develop depending on congenital malformation.[7] As there is no comprehensive data about this issue in our country, the role of congenital malformation on fetal and neonatal mortalities can not completely be established. However, in order to prevent some of neonatal mortality, it is required to diagnose major malformations early and to end these pregnancies within legal and ethic limits. In other words, when antenatal care service is given completely, morbidity can be decreased and the situations which can not avoid mortality will be detected at early periods. It is important to detect in time those who especially live in rural areas and within risk group in terms of delivery and newborn and direct them to health organizations.

Considering the distribution of prenatal care services, more than 90% of pregnant population had prenatal care service at least once while more than 70% of pregnants had prenatal care four or more times. This service is at remarkable rates in cities and western regions. First application month in antenatal care decreased from 3.2 months to 2.2 months in the last 10 years.

It is observed that health organizations are preferred much more in first deliveries, in urban regions, and by those with high education and welfare level living in Middle Anatolia region. There are also some differences in terms of people helping delivery: the rate of deliveries helped by physicians are less than the rate of deliveries helped by nurses or midwifes in east and southeast regions.

The rate of deliveries by cesarean increased to 37% among all deliveries. Cesarean rates increase together with maternal age, and in those living in urban areas and having high education and welfare levels.

Conclusion

Consequently, two points come to our attention trying to reach health data of our country. Firstly, there is no comprehensive registration system for fetuses and newborns, and secondly, the quality of antenatal care services is still low throughout the country while it is primarily responsible for 300.000 babies lost every year before delivery or at newborn period. The solution for these problems can be provided by creating comprehensive registration systems and increasing the quality of antenatal care services. In order to diagnose diseases and risky pregnancies early, proper diagnosis and correct registration system should be added into that solution list.

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Seroprevalence of Toxoplasmosis Among Pregnant Women in Kayseri

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Abstract

Objective: In the present study, we aimed to determine the seroprevalence among pregnant women at risk for taxoplasmosis in Kayseri and contribute to the management of toxoplasmosis in antenatal follow-up of pregnant women in Turkey.

Methods: Toxoplasma IgM antibodies were investigated in 1813 pregnant women, 46 (2.5%) of whom were detected to be positive. Toxoplasma IgG antibodies were investigated in 1676 pregnant women, 568 (33.9%) of whom were found to be positive . Regarding the age-related analysis of pregnant women, toxoplasma gondii IgG positivity was observed to increase with age.

Results: he results obtained in pregnant women aged between 16-45 years, who were referred to Kayseri Maternity Hospital from January 2006-December 2008, were examined retrospectively for toxoplasmosis. Levels of Toxoplasma gondii specific IgG and IgM were determined by microparticle EIA (Axsym, Abbott, USA) technique.

Conclusion: Because of being seronegative for toxoplasma, more than 60% of pregnant women are at risk for toxoplasmosis. Toxoplasma serology and serological surveillance should be performed during obstetrical follow-up of all pregnant women. It is also of high importance to educate seronegative pregnant women about protection from infection.

Keywords: Pregnancy, seroprevalence, toxoplasmosis.

Kayseri'deki gebelerde Toksoplasmoz seroprevalansı

Amaç: Bu çalışmada, Kayseri bölgesinde toksoplasmoz açısından risk altındaki gebelerin seroprevalansının saptanması ve ülkemizde gebelerin antenatal takibinde toksoplasmoz yönetimine katkıda bulunmak amaçlanmıştır.

Yöntem: Ocak 2006-Aralık 2008 tarihleri arasında Kayseri Doğumevi'ne başvuran 16-45 yaş aralığındaki gebelerin sonuçları toksoplasmoz yönünden retrospektif olarak araştırılmıştır. Toksoplasma Ig G ve Toksoplasma Ig M değerleri mikropartikül EIA(Axsym, Abbott, USA) yöntemiyle çalışılmıştır.

Bulgular: Toksoplasma IgM 1813 gebede çalışılmış, 46 (%2.5)'sında pozitiflik saptanmıştır. Toksoplasma IgG 1676 gebede çalışılmış, 568 (%33.9)'inde pozitiflik saptanmıştır. Gebeler yaş gruplarına göre incelendiğinde, toksoplasma IgG pozitifliğinin yaşla arttığı görülmüştür.

Sonuç: Gebelerin %60'dan fazlası seronegatif olduğundan toksoplasmoz açısından risk altındadır. Tüm gebelerin gebelik takibinde Toksoplasmoz serolojilerinin saptanması ve takibi gereklidir. Seronegatif gebelerin enfeksiyondan korunmaları için eğitim verilmesi önem taşımaktadır.

Anahtar Sözcükler: Gebelik, seroprevalans, toksoplasmoz.

Introduction

Toxoplasmosis is a worldwide multi-system infection caused by the protozoan parasite Taxoplasma gondii, which can infect all vertebrates.[1]

The infection follows a 90% asymptomatic course in healthy adults and leaves a life-long immunity. The transmission of the infection to human occurs mainly through raw or rare meat infected with the the tissue cysts, as well as raw

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foods and water contaminated with oocytes.[2] Trophozoites are known to play a major role in the transmission from infected mother to child. Additionally, the infection may also be transmitted through blood transfusion and tissue transplantation from a donor with toxoplasmosis.[3,4]

Toxoplasmosis during pregnancy can lead to not only preterm birth , stillbirth or miscarriage but congenital toxoplasmosis with potentially severe consequences.[1]

Congenital toxoplasmosis occurs as a consequence of placental transmission of the parasite to the fetus after a primary or recurrent parasitemia during pregnancy. In pregnant women with untreated acute infections, the risk of congenital fetal infection was detected to be 25% in the first trimester, 54% in the second trimester, and 65% in the third trimester.[5] This rate exceeds 90% during the last two weeks of pregnancy. Due to increased placental surface area and placental blood flow, the risk of infection increases in direct proportion to the duration of the pregnancy; however, the rate of occurrence of severe sequels is directly proportional to the infection in early gestational weeks.[6,2]

90% of infants with congenital toxoplasmosis are asymptomatic during neonatal period. In time, serious conditions such as cataract, glaucoma, hepatitis, pneumonia, myocarditis, myocyte and mental retardation in addition to hydrocephaly characterized by a classic triad of symptomatic congenital toxoplasmosis, intracranial calcifications and chorioretinitis are observed. To prevent these life-threatening sequels which have a significant effect on the quality of life, antenatal treatment as well as screening and follow-up pregnant women for toxoplasmosis are of great importance.[7]

In the present study, we aimed to determine seroprevalence among pregnant women at risk for toxoplasmosis and contribute to the management of toxoplasmosis in antenatal follow-up of pregnant women.

Methods

The results obtained in pregnant women aged between 15-45 years who were referred to Kayseri Maternity Hospital between January 2006 and December 2008, were examined retrospectively for toxoplasmosis. Levels of Taxoplasma gondii-specific IgG and IgM that are routine antenatal screening tests in asymptomatic pregnant women, were determined using microparticle EIA (Axsym, Abbott, USA) technique. IgM index values of ≥0.600 were defined as positive, values between 0-0.499 as negative and those between 0.500- 0.599 as equivocal . IgG index values of ≥3.00 IU/ml were defined as positive, values between 0-1.99 IU/ml as negative and those between 2.00-2.99 IU/ml as equivocal. Of over 3000 registered patients in the hospital database, those aged between 15-45 years were selected and recurrent cases were excluded. Data from 1813 patients were collected for Toxoplasma IgM and data from 1676 patients for Toxoplasma IgG and entered into SPSS version 17.0 for Windows for the statistical analysis.

Results

Toxoplasma IgM antibodies were investigated in 1813 pregnant women, 46 (2.5%) of whom were detected to be positive. In 16 (0.9%) patients, IgM values were found to be between 0.5 and 0.599 and defined as equivocal. Toxoplasma IgM antibodies were reinvestigated in these patients three weeks later, which however, was not included in the study. In 36 of 46 pregnant women who were positive for toxoplasma IgM antibodies, Toxoplasma IgG was also found to be positive.

Since only IgM is evaluated in acute infection assays in several pregnancy follow-up studies, the number of patients in whom Toxoplasma IgG antibodies were investigated was smaller than that in whom Toxoplasma IgM antibodies were measured and Toxoplasma

IgG antibodies were investigated in 1676 cases, 568 (33.9%) of whom were detected to be positivite.

When 1676 pregnant women in whom Toxoplasma IgG antibodies were investigated, were evaluated after being divided into 3 age groups, IgG positivity was determined as 28.1% in those aged between 15-25 years, 35.2% in those between 26-35 years, increasing up to 46.7% in those between 36-45 years (Table 1).

Table 1. Toxoplasma gondii IgG positivity according to age in pregnant women.

Age	The number of pregnant women	Positive
15-25	622	175 (28.1%)
26-35	859	302 (35.2%)
36-45	195	91 (46.7%)
Total	1676	568 (33.9%)

Discussion

Seroprevalence of toxoplasmosis varries throughout the world depending on age, socioeconomic conditions, eating and hygiene habits, climate and geographic location. The infection is more common in societies with low socioeconomic level, lack of hygiene during feeding and frequent contact with soil and cats. The seroprevalence increases with age.[8]

Table 2 and 3 present the rates of Toxoplasma gondii IgG positivity obtained from studies on pregnant women and women of reproductive age in Turkey and in the world.

The rates of Toxoplasma IgG gondii positivity in pregnant women and women of reproductive age vary across countries and regions througout the world. Similarly, regional differences manifest themselves in rates for our country.

In the present study, seroprevalence of toxoplasmosis was found to be 33.9% in pregnant women, which is consistent with other results obtained in Turkey. However, this rate is lower when compared to those obtained in particularly Hatay and Şanlıurfa, which is considered to be caused by cultural differences in eating habits.

When 1676 pregnant women who were screened for Toxoplasma IgG antibodies, were evaluated after being divided into 3 groups according to their ages, it was observed that the seropositivity increased in direct proportion to the age.

In the present study, because of being seronegative for toxoplasma, more than 60% of pregnant women are at risk for toxoplasmosis. These pregnant women should be given education about the transmission of toxoplasmosis and ways to protect against the infection.

In the present study, IgM positivity was found to be 2.5%. However, false-positive results may be obtained in IgM testing and the

Table 2. Toxoplasma IgG positivity (%) in women of reproductive age.

In other countries(9)		In Turkey	
Spain, 2000	43.8	Ankara, 2002[10]	31.7
Indonesia, 2003	60	Şanlıurfa, 2007[11]	69.5
Netherlands, 2004	35.2	Isparta, 2008[12]	25.2
Brasil, 2004	51.2	Malatya, 2008[13]	32.5
USA, 2007	11		
Switzerland, 2007	8.2		
İran, 2007	63.9		
Greece, 2008	21.2		
Romania, 2008	57.6		

Table 3. Toxoplasma IgG positivity (%) in pregnant women

In other countries		In Turkey	
Argentina, 2003[9]	48.7	Ankara, 2001(14)	38.1
Britain, 2005[9]	9.1	Sivas, 2002(15)	46.6
Brasil, 2006[9]	61.1	Şanlıurfa, 2004(16)	60.4
Switzerland, 2006[9]	35	Afyonkarahisar, 2004(17)	30.7
Mexico, 2006[6]	6.1	Aydın, 2005(18)	30.1
Morocco, 2007[9]	50.6	Hatay, 2007(19)	52.1
India, 2007[9]	45	Van, 2009(20)	36
Poland, 2008[21]	55.5	Kocaeli, 2009(22)	48.3
Colombia, 2008[23]	45.8	**Kayseri (This study)**	**33.9**
France, 2009[24]	43.8		
Albania, 2009[25]	48.6		
China, 2009[26]	10.6		

positivity may continue for nearly a year. Therefore, IgM positivity does not always predict an acute infection whereas IgM negativity does not exclude the infection because of the fact that IgM positivity may not be detected at the onset of the infection or when tested at the late stage of pregnancy, the result might have become negative although the mother had been infected during the pregnancy. For this reason, IgG avidity test in addition to IgM and IgG antibody testing should be performed in the first trimester of pregnancy. High avidity results, particularly, are suggested to represent the acquisition of the infection at least 3-5 months ago.[15,27]

Since the diagnosis of toxoplasmosis is established when a pregnant women who is seronegative for toxoplasmosis prior to the pregnancy becomes positive during the pregnancy, a basal serologic test should be performed before a planned pregnancy.

Conclusion

Toxoplasmosis is of critical importance because of leading to serious complications when acquired as primary infection during pregnancy. In examinations of women of reproductive age before and after pregnancy, serologic tests for toxoplasmosis should be performed, which should be followed by required treatments and follow-up according to the obtained result. Pregnant women who have not been infected with t. gondii, should be educated about protection methods.

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The Impact of Placental Location on Early Fetal Growth

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Abstract

Objective: In this study it is aimed to determine the impact of the placental placement of the fetus on the biometric parameters assessed during 11-14 th gestational weeks in singleton pregnancies.

Methods: According to the study including criteria, 1615 pregnant women were evaluated. The median maternal age was 29.0±4.6 years. 54% of pregnant women were nulliparous and the rest 46% was multiparous. Median pregnancy number was 1.0±1.06. Median sonographic pregnancy week was 12.57±0.63 weeks. Fetal placental placement was 50.2% anterior, 41% posterior, 5.3% lateral and 3.5% fundus. The analysis done separately for 11 0-11 6; 12 0-12 6; 13 0 -13 6 week intervals showed no statistically significant difference between groups of placental locations in terms of in terms of biometric measurements.

Results: We retrospectively assessed spontaneous pregnancies screened between 2004 – 2010 having no uterine or anatomical abnormalities, systemic disease and family history of genetic diseases. Prenatal ultrasound biometry parameters like biparietal diameter (BPD), head circumference (HC), abdominal circumference (AC), femur lenght(FL) and crown-rump length (CRL) were evaluated. Fetuses were divided into groups according to placental location and whether groups differ in terms of biometric values was investigated. The effect of placement of the placenta on biometric values were evaluated separately for 11 0-11 6; 12 0-12 6; 13 0 -13 6 week intervals.

Conclusion: There is no significant effect of the placental placement of the fetus on the biometric parameters assessed during 11-14 th gestational weeks in singleton pregnancies.

Keywords: Placenta, biometry, fetus, ultrasonography, localization, growth.

Plasental Yerleşimin Erken Fetal Büyümeye Etkisi

Amaç: Gebeliğin 11-14.haftasındaki tekil gebeliklerde elde edilen biyometrik parametrelere plasenta yerleşiminin etkisinin var olup olmadığının araştırılması amaçlanmıştır.

Yöntem: Birinci trimester taraması 2004 - 2010 yılları arasında yapılmış olan, sistemik hastalığı veya ailevi genetik hastalığı olmayan, spontan gebelik öyküsü bulunan, uterin veya fetal anatomik anomali saptanmayan gebeler retrospektif olarak değerlendirmeye alındı. Biparietal Çap (BPD), Baş çevresi (HC), Karın çevresi (AC), Femur uzunluğu (FL) ve Baş-Popo Mesafesi (CRL) gibi prenatal ultrasonografik biyometri parametreler değerlendirmeye alındı. Fetuslar plasenta yerleşimine göre gruplara ayrılarak gruplar arasında biyometrik değerler açısından farklılık olup olmadığı araştırıldı. Biyometrik değerlere plasenta yerleşiminin etkisi 11 0-11 6; 12 0-12 6; 13 0 -13 6. haftalar için ayrı ayrı değerlendirildi.

Bulgular: Çalışma kriterlerine uygun 1615 gebe değerlendirmeye dahil edildi. Ortanca anne yaşı 29.0±4.6 yıl saptandı. Ortanca gebelik sayısı 1.0±1.06 bulundu. Gebelerin %54'ü nullipar ve %46'sı multipar idi. CRL'ye göre ortanca sonografik gebelik haftası 12.57±0.63 hafta idi. Fetusların plasenta yerleşimi %50.2 anterior, %41 posterior, %5.3 lateral ve %3.5 fundus idi. Yapılan değerlendirmede 11 0-11 6; 12 0-12 6; 13 0 -13 6. haftalar için gruplar plasenta yerleşimine göre parametreler karşılaştırıldığında anlamlı fark saptanmadı.

Sonuç: 11-14.hafta tekil gebeliklerde prenatal ultrasonografik değerlendirme ile elde biyometri parametrelerine plasenta yerleşiminin etkisi mevcut değildir.

Anahtar Sözcükler: Plasenta, biyometri, fetus, ultrasonografi, lokalizasyon, büyüme.

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Introduction

In the present clinical practice, ultrasonographic fetal examination and evaluation of chromosomopathy is performed in the first trimester. This approach helps early detection of probable malformations of fetus and guiding to treatment if possible, thus it serves reduction in the general health expenses. Therefore, the determination of the standard measurement values obtained in the first trimester ultrasonography and their alterations related to maternal, fetal or environmental factors is important for the assessment of these measurements.[1-3]

In this study we aimed to determine the impact of the placental location of the fetus on the biometric parameters assessed during 11-14 th gestational weeks in singleton pregnancies.

Methods

We retrospectively assessed spontaneous pregnancies screened between 2004–2010 without the uterine or anatomical abnormalities, systemic disease and family history of genetic diseases. Prenatal ultrasound biometry parameters like biparietal diameter (BPD), head circumference (HC), abdominal circumference (AC) and crown-rump length (CRL) were evaluated for the ones matching inclusion and exclusion criteria above. As previously described in the literature, fetuses were divided into groups according to their placental location, namely as anterior if the main part of placenta lies close to the anterior wall of the uterus; posterior if the main part of placenta lies close to posterior wall; lateral if the main part of placenta lies close to lateral walls and fundal if the main part of placenta lies at the fundus.[4] Whether groups differed in terms of biometric values was investigated. The effect of location of the placenta on biometric values were evaluated separately for 11 0-11 6; 12 0-12 6; 13 0 -13 6 week intervals.

Anova test was used for the evaluation of mean values between groups. The statistical analyses were done with SPSS for Windows version 14.0 (SPSS Inc, Chicago, IL, ABD). The value of $p < 0.05$ was considered as statistically significant.

Results

According to the study including criteria, 1615 pregnant women were evaluated among 1725 pregnancies evaluated in the first trimester. The median maternal age was 29.0±4.6 years. . Median pregnancy number was 1.0±1.06. Fifty-four percent of pregnant women were nulliparous and the rest 46% was multiparous. Median sonographic pregnancy week was 12.57 ± 0.63 weeks.

Fetal placental location was anterior in 50.2%, posterior in 41%, lateral in 5.3% and fundus in 3.5%. The comparisons of the groups according to the demographics like median maternal age, median number of pregnancies and median gestational week are shown in the table 1. Among groups there was found no statistical significant differences in the median maternal age, median number of pregnancies and median gestational week. The comparative analysis of the biometric measurements of the

Table 1. Demographics of groups based on placenta location (Median ± S.D).

Placenta Location	Anterior	Posterior	Lateral	Fundus	p
Maternal Age	29.0 ± 4.6	29.0±4.7	30.0±3.8	30.0±3.9	0.184
Number of Pregnancies	1.0±0.92	1.0±1.21	1.5±0.67	1.0±0.50	0.126
USG gestational week	12.57±0.64	12.57 ±0.63	12.57±0.55	12.50±0.56	0.604

groups done separately for 11 0-11 6; 12 0-12 6; 13 0 -13 6 week intervals is shown in the Table 2. The analysis showed no statistically significant differences between groups of placental locations in terms of biometric measurements.

Discussion

It is important to know the normal patterns of all measurements done in the first trimester ultrasonographic scanning and their alterations according to the maternal and fetal factors in order to assess these measurements in the proper way.[1-3] Thus, in our study the effect of placental location on the ultrasonographic measurements done in the first trimester was studied retrospectively. Limited numbers of studies on this subject are present in the literature.

Woods et al suggested that placental location had no effect on the babies` weights in a study which evaluated 940 term babies at birth.[5] In another study of Woods et al, they suggested no effect of placental location on both newborn babies` weights and newborn babies` heights.[6] In that study, also it was suggested that babies with fundal location of placenta had larger head circumference in comparison with the other locations. Distinctively our study included earlier intrauterine period and it suggested no effect of placental location on the measurements of first trimester ultrasonography including biparietal diameter, head circumference, abdominal circumference and crown-rump length. In our study, mean biparietal diameters of the fetuses with fundal location of placenta were smaller compared to the other sites in the 11th and 12th gestational weeks but this difference was not statistically significant. Though Woods' finding related to the larger head circumference of term babies with fundal placenta was not confirmed in our study for an earlier life period of fetus, whether this difference occurs later in fetal life should be sought by further comparative studies done throughout the whole period of fetal development. In the study of Sto?kov et al which followed 289 pregnancies after determination placental location in the third trimester, it was suggested that location of placenta had no effect on birth weights and heights of the babies.[7]

Our study includes the measurements which are done in the first trimester. Other three studies included the measurements of the term babies done after birth. However, in all studies the measurements of fetuses or babies were not affected by the location of placenta (except

Table 2. Fetal biometrics according to the localization of placenta.

Gestational Week		Biparietal Diameter (mm)	Head Circumference (mm)	Abdominal Circumference (mm)	Femur Length (mm)	CRL (mm)
11 ^{0}-11 ^{6} Week	Anterior (n=187)	18.31±1.71	69.88±5.69	55.03±4.56	5.54±1.05	53.75±4.37
	Posterior (n=153)	18.18±1.72	69.61±6.09	54.79±4.68	5.56±1.10	53.67±4.39
	Lateral (n=11)	18.36±1.50	68.80±5.43	55.60±3.50	6.08±1.12	52.00±3.82
	Fundus (n=11)	17.45±1.21	67.27±4.56	52.81±4.83	5.47±0.91	50.82±3.84
12 ^{0}-12 ^{6} Week	Anterior (n=439)	21.11±2.00	79.56±6.19	63.67±5.67	7.54±1.53	63.14±4.93
	Posterior (n=359)	21.16±1.93	79.37±6.54	63.88±5.81	7.49±1.58	63.10±4.62
	Lateral (n=60)	20.98±1.68	79.17±6.44	63.92±6.25	7.10±1.23	62.12±3.63
	Fundus (n=38)	20.16±1.75	76.81±5.51	61.85±5.69	6.94±1.37	61.50±4.57
13 ^{0}-13 ^{6} Week	Anterior (n=168)	24.38±2.09	90.88±7.14	74.21±6.29	10.09±1.85	74.13±5.45
	Posterior (n=137)	24.09±2.23	89.87±7.10	73.10±6.23	9.83±1.93	73.68±5.81
	Lateral (n=13)	24.12±1.42	88.73±6.67	72.55±6.63	10.30±1.46	73.46±4.71
	Fundus (n=7)	24.28±1.60	91.00±6.32	72.71±9.76	10.17±2.14	73.28±3.94

larger head circumference of the babies with fundal placenta in the study of Woods). As a result, it can be concluded that the measurements related to the growth of the fetuses are not affected by the location of placenta starting from the first trimester to birth. During the development of placenta, chorion villuses migrate to the locations where the blood flow is appropriate and this phenomena is explained by the tropotrophism theory.[8,9] It seems that unless blood flow to the placenta is not appropriate, the first localization of placenta does not have an important effect on the fetal growth. In addition, in case of placenta previa the birth weights are lower and this situation is rather attributed to preterm birth.[10] In another study, though there was found no difference in terms of birth weight and chest circumference in births of 28-32th weeks, there was significant difference in the births after 33th weeks in cases of placenta previa.[11] Also it has been shown that the restriction of intrauterine growth of preterm newborns without anomalies is frequently symmetrical and is mainly attributed to abnormal uteroplacental or feto-placental blood flow.[12]

Conclusion

As a conclusion, blood flow to the placenta rather than placental location seems to be more important for the fetal growth. Our present preliminary study suggests that the location of placenta does not affect the fetal growth in terms of biometric parameters. More detailed studies on this subject might be helpful for further understanding.

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Fetal Goiter in the Absence of Maternal Thyroid Disease: A Case Report

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Abstract

Objective: Most believe that it is important to be able to recognize and treat the fetal hypothyroidism in order to get the most out of growth and intellectual development in affected fetuses.

Case: A case has been introduced dealing with a woman contracted with fetal goiter that was identified by ultrasonography at 30 weeks of gestation. In Doppler examinations, it was realized that the thyroid gland was highly vascularized and diffusely enlarged. Under these circumstances, fetal goiter may only have something to do with fetal hypothyroidism. The patient was offered to get through amniotic fluid sampling via amniocentesis or cord blood sampling via cordocentesis, but she rejected the performance of these procedures.

Conclusion: Our priority is, whenever the situation permits, to trust in the ultrasonographic measurement of goitre size and color doppler signal, since it is of vital importance to be able to recognize and observe the fetal goiter based on ultrasound and Doppler examination.

Keywords: Fetal goiter, ultrasonography, prenatal diagnosis.

Maternal tiroid hastalığı yokluğunda fetal guatr: bir olgu sunumu

Amaç: Etkilenen fetusların çoğunda fiziksel ve zihinsel gelişme geriliklerine yol açabildiğinden, fetal hipotiroidizmin tanınması ve tedavi edilmesinin oldukça önemli olduğu düşünülmektedir.

Olgu: Bu yazıda 30 haftalık iken ultrasonografi ile tespit edilmiş bir fetal guatr olgusu sunulmuştur. Hastanın tiroid hastalığı öyküsü mevcut değildi ve tiroid otoantikorlarının negatif oluşu da dahil tüm tiroid fonksiyon testleri normaldi. Dopler ultrasonografide diffüz olarak büyümüş ve yüksek oranda kanlanan tiroid bezi izlendi. Bu durumda fetal guatrın sadece fetal hipotiroidizme bağlı olabileceği düşünüldü. Kesin tanı için amniosentez veya kordosentez yaptırması önerilen hasta bunu kabul etmedi.

Sonuç: Bu durumda önceliğimiz, klinik durumun tanı ve takibinin öneminden dolayı, ultrason bulguları ve dopler ölçümlerine güvenmek oldu.

Anahtar Sözcükler: Fetal guatr, ultrasonografi, prenatal tanı.

Introduction

Thyroids disorders are common endocrine disorders encountered during the perinatal period. It is very difficult to identify and diagnose the fetal goiter, while maternal thyroid abnormalities can be easily diagnosed applying maternal serum testing.[1] Different biochemical defects in thyroid hormone synthesis, or maternal autoimmune thyroid disease might cause fetal goiter.[2] Goiter might have association with fetal hypothyroidism or hyperthyroidism. Many

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authors, on this issue, believe that fetal thyroid function has to be determined for beginning the early treatment.[3] Weiner et al reported that they diagnosed the fetal goiter by means of prenatal sonography for the first time in 1980.[4] A very large goiter inside uterus might cause polyhydramnios because of esophageal and tracheal compression, and distocia as well, leading to hyperextension in the neck.[5]

Case

The patient was a 28 year-old primigravida who referred to our hospital at 30 weeks of gestation for having ultrasound examination. The ultrasound examination indicated a large homogeneous mass in the anterior aspect of the fetal neck. The mother was married to a second-degree cousin. There was no family history of thyroid or autoimmune diseases and no maternal history of a past thyroid disease. There was no known guatrogens including iodine or thyroid medications. Following ultrasonography a wide, symmetrical bilobated thyroidal mass and a mild polyhydramnios, compressing the fetal trachea in the anterior portion of the neck, were detected. The mass appeared highly vascularized during the Power Doppler examination (Figure 2). After birth, color Doppler examination showed a diffusely enlarged thyroid gland (Figure 3).

Fetal heart rate was about 220 beats/min. No other anomaly was noted in the fetus. Fetal growth and movements were normal. Maternal serum thyroid function test results were normal. Ultrasound of the maternal thyroid was usual. We suggested amniotic fluid sampling via amniocentesis or cord blood sampling via cordocentesis to the mother but she refused the suggestion. The patient was advised for bed rest to avoid premature labor. We did not attempt to obtain fetal blood to confirm fetal hypothyroidism, however we proposed intra-amniotic l-thyroxin injections for to start early treatment.

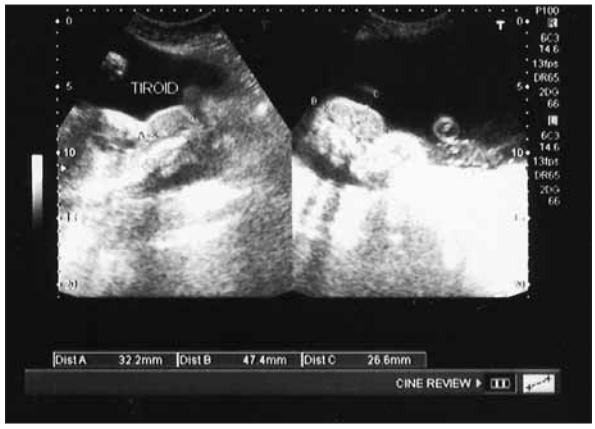

Figure 1. Symmetrical bilobated thyroidal mass.

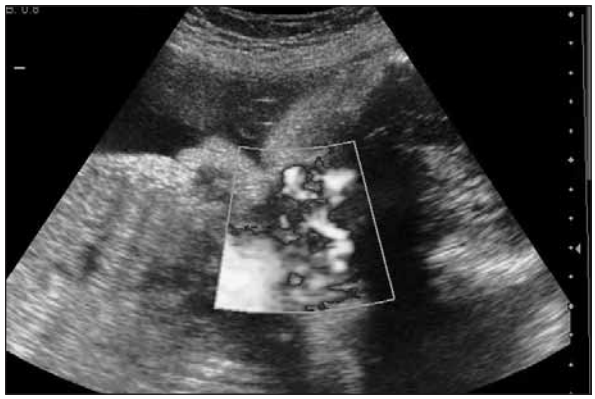

Figure 2. Highly vascularized mass.

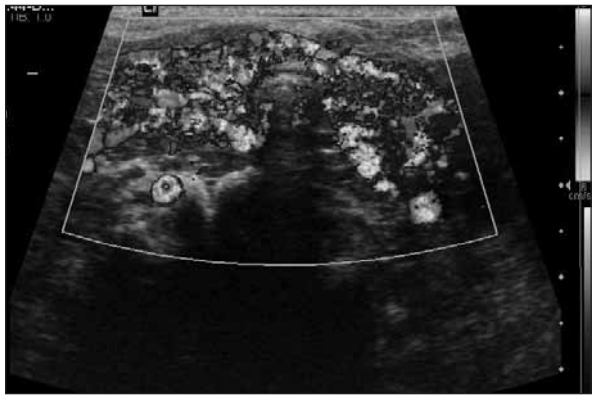

Figure 3. After birth, color Doppler examination showed a diffusely enlarged thyroid gland.

Both parents did not allow this procedure too. We tried to rely on ultrasonographic measurement of goiter size and color Doppler signal

when applicable. At 36 weeks of gestation the patient is hospitalized for premature rupture of membranes and delivered a male newborn, weighing 2600 g by caesarean section because of the narrow pelvis. His Apgar scores were 6 at 1 min and 7 at 5 min. Although a soft bilobated goiter was present, neonatal airway obstruction was not observed and resuscitation was not needed. He had no problem in respiratory adaptation postnatally. Measurement of TSH and iodothyronines in the cord blood confirmed the diagnosis of primary hypothyroidism. Thyroid hormone therapy commenced on the first day of life with a daily oral dose of 50 Ìg levothyroxine. The weight, height and psychomotor development of the child were normal at 6 months of age.

Discussion

Incidence rate of congenital hypothyroidism is one out of 4000 live birth, causing the mental retardation that can most commonly be treated.[6] It is very seldom (one out of 4000) to encounter fetal guatrous hypothyroidism, constituting only 10 to 15% of all congenital hypothyroidism cases.[7] Because of the development of ultrasound technology, reports on the investigations of fetal goiter, despite being a rare incidence, has gradually been increasing.[8]

A large goiter may cause hyperextension of the fetal neck, resulting in malpresentation and complicating labor and delivery. Following the birth, the trachea may be blocked by goiter, which may cause asphyxia and death. During delivery, pediatric anesthesia and pediatric ear, nose and throat consultants have to be present in an adjoining theater with intubation and bronchoscopy equipment set up. Neonatal screening programs have successfully been used for diagnosing congenital hypothyroidism shortly after birth, and the prognosis for normal development has dramatically improved with earlier postnatal treatment. However some infants exposed to congenital hypothyroidism have encountered difficulties and delays in neuromotor, perceptual and language abilities, despite early postnatal therapy. Therefore, antenatal treatment of congenital hypothyroidism has to be taken into account and given priority.[9]

Pathological cases, including the thyroid gland, can easily be distinguished from cases with other neck lesions detected at ultrasound. The differential considerations of fetal goiter should include all anomalies of the anterior and anterolateral nuchal region, including teratomas, thyroglossal duct cysts, cystic hygromas, lymphangiomas/hemangiomas, branchial cleft cysts and other developmental cystic lesions.[10] These lesions frequently appear as fluid-filled cystic masses. This finding enables the differentiation of the neck lesions from thyroid gland masses.[11]

Amniotic fluid concentrations of TSH accurately reflect fetal serum levels, but Bruner and Dellinger consider cord blood measurements more reliable, thus render evaluation through amniocentesis doubtful. Fetal thyroid function can be accurately assessed by fetal blood sampling, but this procedure is riskier with about 1 % fetal demise in experienced hands.[12]

We reported this situation to the family members but the parents rejected the suggestion of performing amniocentesis and/or fetal blood sampling. We observed the size and fetal development of the fetal goiter until delivery, using the ultrasound and Doppler examination.

Conclusion

As a result, ultrasound and Doppler examination are of vital importance in recognition and observation of fetal goiter. Therefore, mental retardation and other developmental (evolutional) disorders could be prevented in the incidence where early diagnosis and treatment have already been utilized.

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Successful Maternal and Fetal Outcome in a Pregnancy With Type V Takayasu's Arteritis

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Abstract

Objective: Takayasu's Arteritis is a rare idiopathic, chronic inflammatory disease causing intimal proliferation. Preexisting hypertension in pregnant women with Takayasu's Arteritis may pose risks for both the mother and the fetus. The aim of this study is to report a pregnant woman with Type V Takayasu's Arteritis and pregnancy outcomes.

Case: The 34yearold woman with the diagnosis of Takayasu's Arteritis for 6 years had stopped her Takayasu's Arteritis medications without having asked her doctor at the time she learned of her pregnancy. After an uncontrolled pregnancy, when she presented to our clinic without any antenatal followup, no complications of pregnancy were determined in her first examination. After vaginal delivery she was discharged on the second postpartum day with no maternal or fetal complications.

Conclusion: Although there was no problem due to Takayasu's Arteritis in our patient and she experienced a pregnancy without any problems, pregnant women with Takayasu's Arteritis should be regarded and followedup as high risk pregnancies due to the risk of hypertension.

Keywords: Takayasu's arteritis, pregnancy.

Tip V Takayasu Arteritli bir gebelikte başarılı maternal ve fetal Sonuç

Amaç: Takayasu Arteriti, idiyopatik, nadir görülen, kronik, intimal proliferasyon gösteren inflamatuvar bir hastalıktır Gebeliği olan Takayasu arteritli kadınlarda ise mevcut olan hipertansiyon, anne ve fetus açısından riske neden olabilmektedir Bu yazıda amacımız Tip V Takayusu arterit hastası bir gebeyi ve gebelik sonuçlarını sunmaktır.

Olgu: Otuz dört yaşında, 6 senedir Takayasu Arteriti tanısı olan olgu, gebe olduğunu öğrendiği anda doktora başvurmadan kendi kararı ile Takayasu Arteriti için aldığı ilaçları almayı bırakmış. Antenatal takibi hiç yapılmamış olan olguda takipsiz bir gebelik süreci sonrasında kliniğimize başvurduğu ilk muayenesinde gebelik komplikasyonu saptanmamıştır. Vajinal yolla doğum yapan, travay ve postpartum süreçte maternal ve fetal herhangi bir komplikasyon gelişmeyen hasta postpartum 2.günde taburcu edilmiştir.

Sonuç: Olgumuzda Takayasu Arteritine bağlı bir problem olmamasına ve sorunsuz bir gebelik geçirmiş olmasına rağmen, Takayasu arterit hastası olan gebeler hipertansiyon riski nedeniyle yüksek riskli gebelik olarak kabul edilmeli ve takipleri buna uygun yapılmalıdır.

Anahtar Sözcükler: Takayasu arteriti, gebelik.

Introduction

Takayasu's Arteritis (TA) is a rare, idiopathic chronic inflammatory disease causing intimal proliferation.[1] Its annual incidence is 2.6/million new cases and the prevalence is 2.6-6.4/million.[2] The disease affects women more commonly than men and the mean age at which the disease appears is in the second decade. Its etiology is still not clearly understood.[3] It is a rare polyarteritis characterized by fibrosis in the renal and pulmonary arteries, more commonly affecting the branches of the aortic arch.[4] The

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symptoms and signs appear as a consequence of obliterative vascular changes. Coldness and pain in the upper extremities, claudication in the lower extremities due to narrowing of the iliac artery, and intraabdominal and cerebral ischemia due to disease involvement of the mesenteric and cervical arteries may occur. Retinopathy may cause visual loss.[4] High blood pressure levels are present in 33-50% of patients with TA and this hypertension especially occurs in patients with renal artery involvement and stenosis.[2,3,5] Preexisting hypertension in pregnant women with TA may pose risks for the mother and the fetus.[6-8] Herein we report a pregnant woman with Type V TA and the consequences of pregnancy.

Case

Takayasu's Arteritis (TA) that had been present for 6 years was determined in the history of a 34-year-old woman with gravida 3 and parity 2, who had presented to our clinic due to the commencing of uterine contractions at the 39+3 weeks' gestation of her pregnancy according to her last menstruation date. The patient was poorly compliant with her medication and had stopped taking her drugs that had been prescribed for TA (Prednisolone 15 mg/day, Pentoxyphillin 400 mg/day, Acetylsalicylic acid 100 mg/day) at the sixth week of her pregnancy without having informed any doctor. She had not been to any medical facility for the antenatal follow-up.

On her physical examination, blood pressure could not be measured on either of the upper extremities. The radial pulse could not be obtained bilaterally on either of the upper extremities, while the brachial arterial pulses were palpated as weak. On her bilaterally lower extremity arteries, the arteria femoralis, tibialis posterior and dorsalis pedis, pulses were palpated weak.

On the obstetric examination, the cervical opening was 5 cm, effacement 60%, the fetus was on vertex presentation, the level was -2. On the contraction stress test, she had regular contractions as high as 70-80 mmHg and the test was negative. On ultrasonographic examination, there was a fetus consistent with 38-39 weeks of gestational age, with head presentation and estimated weight of 3230 grams. The amniotic index was 165 mm. On Doppler examination, the umbilical artery Systole/Diastole ratio was determined as 2.22. On laboratory evaluations, complete urine analysis, complete blood count, biochemical tests including liver function tests and coagulation parameters were all found to be normal.

The angiography of thoracoabdominal aorta and its branches performed about 1 year ago had shown widespread and severe stenosis. The graphy had shown stenosis in the truncus brachiocephalicus (1), bilaterally subclavian arteries (2,5), right a.carotis interna (3), left a.carotis interna (4), bilaterally upper extremity arteries (arrows). The graphies had shown also generalized stenosis and contour irregularities on the descending thoracic aorta and in the area of the infrarenal abdominal aorta, especially involved bilateral renal arteries and superior mesenteric artery, stenotic aortic bifurcation and common iliac arteries (6) (Figure 1). According to these physical examination and angiographic findings the patient was determined as Type V TA.

The patient's status underwent the consultations of the cardiology, cardiovascular surgery, internal medicine and rheumatology clinics, and no contraindications for vaginal birth were determined through a multidisciplinary approach. After 4 hours of active labor, a 3100 g. girl baby with an Apgar score of 7/9 was delivered through vaginal birth. No peripartum maternal or fetal complications developed. No anomaly was detected in the fetus. The patient was discharged on the second postpartum day.

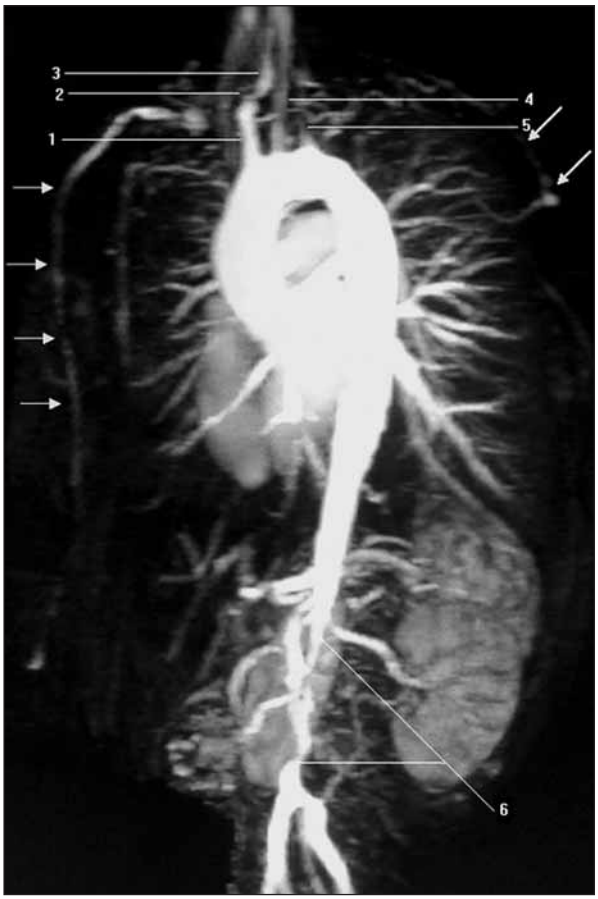

Figure 1. 34-year-old woman with Type V Takayasu's arteritis. Oblique angiography shows generalized severe stenosis in the truncus brachiocephalicus (1), bilaterally subclavian arteries (2,5), right a.carotis interna (3), left a.carotis interna (4), bilaterally upper extremity arteries (arrows), and infrarenal abdominal aorta (6).

Discussion

Takayasu's Arteritis, which was first defined by the Japanese ophthalmologist Takayasu, is a chronic inflammatory disease of unknown etiology which affects the aorta and the large branches.[2] Takayasu's Arteritis has a large distribution with a high incidence, especially in Japan, East and South Asia, and India. Although its etiology still not clearly understood, autoimmunity is accused.[3]

TA is classified into 6 types anatomically and pathologically.[9,10] Type I involves only the branches of the aortic arch. Type IIa involves the aorta only at its ascending portion and/or at the aortic arch. The branches of the aortic arch may be involved as well. The rest of the aorta is not affected. Type IIb affects the descending thoracic aorta with or without involvement of the ascending aorta or the aortic arch with its branches. The abdominal aorta is not involved. Type III is concomitant involvement of the descending thoracic aorta, the abdominal aorta, and/or the renal arteries. The ascending aorta and the aortic arch and its branches are not involved. Type IV involves only the abdominal aorta and/or the renal arteries. Type V is a generalized type, with combined features of the other types.

Our patient was classified as Type V, due to physical examination and angiography findings of widespread contour irregularities on the arcus aorta, descending thoracic aorta and abdominal aorta, in addition to diffuse involvement of the renal artery, superior mesenteric artery and iliac arteries bilaterally (Figure 1).

The clinical patterns of TA differ at the acute and chronic periods. In the acute period, systemic symptoms prevail, while in the chronic period, insidious ischemic-destructive signs are more prevalent. These signs appear together with stenosis at a rate of 85%, dilatation at a rate of 2%, and stenosis and dilatation at a rate of 13%.[2]

Asymmetrically decreased peripheral pressure is determined in most of the patients. In approximately all of the patients, the measured blood pressure difference on symmetrical extremities is found to be higher than 10 mmHg.[2,6] The evaluation of hypertension should be carefully performed on patients with TA, because peripheral blood pressure may be determined to be significantly lower than its actual value due to involvement of the aortic arch. Ideally, the central blood pressure should be measured using an aortic transducer.

Preexisting hypertension in pregnant women with TA may pose risks for the mother and the fetus.[3,7,8,11] In our patient, however,

peripheral blood pressure could not be measured due to stenosis constituted by arteritis. Nevertheless, an invasive procedure, or a central catheter was not applied to her since the patient gave vaginal birth.

Gasch et al. reported the rate of pregnancy-induced hypertension/preeclampsia as 39% in their study of 137 pregnant women. Furthermore, they stated that although heart failure had developed in 5 of their cases, no maternal deaths had occurred.[11]

In the evaluation of 115 cases from different centers with regard to the problems in the fetus due to ischemic and destructive reasons, the abortus rate was 15.6%, the premature birth rate was 9.5%, and the intrauterine growth retardation rate was 17%, and neonatal death was reported in only 1 case.[3,5,7,8]

The rate of caesarean section was 26%. Twenty of the caesarian indications were maternal causes and 17 of these were maternal hypertension/preeclampsia and other vascular diseases.[3,5,7,8]

There are some case reports on this subject in the Turkish medical literature. In 2 of the case reports, the birth facilitated through caesarean section.[12,13] In the first case with high arterial blood pressure values and with the development of a superimposed preeclampsia, the indication of cesarean section was fetal distress,[12] while in the second case with normal blood pressure values all throughout her pregnancy, the cesarean indication was not clearly stated and the presence of TA singly was regarded as a maternal medical indication.[13]

In this case report, the woman did not undergo routine antenatal follow up. When the woman presented to our hospital at the term of her pregnancy, there were no pathological findings on the physical examination except non-palpable arterial pulsations of the peripheral arteries. Although she stopped the medical treatment of TA during her pregnancy, her pregnancy continued till the term and she did not present with any complications of pregnancy.

Conclusion

In conclusion, pregnancy per se does not appear to exacerbate the disease, but management of hypertension is essential for a successful maternal and fetal outcome. The pregnant women with TA should be regarded and followed-up as high risk pregnancies due to the risk of hypertension.

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Isolated Fetal Endocardial Fibroelastosis Diagnosed and Terminated at 22 Weeks of Gestation: A Case Report

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Abstract

Objective: We present a case of diffuse endocardial fibroelastosis diagnosed at 22 weeks of gestation. The classification and clinical approach to fetal cardiomyopathies based on this syndrome will also be discussed.

Case: A healthy 22 year old primigravid woman had an uneventful pregnancy until the ultrasonographic examination at 22 weeks of gestation. Fetal echocardiographic evaluation revealed a dilated and hypotonic left ventricle with diffuse hyperechogenic endometrial lining. Left ventricular endocardium was thickened with accumulation of layers of collagen and elastin. Pathological confirmation of the diagnosis could not be made because parents refused autopsy examination.

Conclusion: Endocardial fibroelastosis is a rare disease and sporadically diagnosed during antenatal period. Sonographic criteria include a dilated left ventricle with poor contractility and hyperechogenic bright thickening of endocardial surface. When diagnosed, it should be wise to terminate the affected pregnancy since the prognosis is poor if it's detected before fetus is viable.

Keywords: Endocardial fibroelastosis; cardiac; pregnancy termination.

Yirmiikinci gebelik haftasında tanı konan ve termine edilen nadir bir izole endokardiyal fibroelastoz vakası: Bir olgu sunumu

Amaç: Yirmiikinci gebelik haftasında tanı konulan bir diffüz endokardiyal fibroelastoz vakasını sunuyoruz. Bu sendrom üzerinden fetal kardiyomiyopatilerin sınıflandırması ve klinik yaklaşım da tartışılacaktır.

Olgu: Sağlıklı 22 yaşındaki primigravid bir kadın 22. gebelik haftasındaki ultrason muayenesine kadar sorunsuz bir gebelik geçirmekteydi. Fetal ekokardiyografik değerlendirmede, diffüz hiperekojen endokardiyal çizgilenme ile birlikte olan dilate ve hipotonik sol ventrikül görüldü. Sol ventrikül endokardiyumu kollajen ve elastin tabaklarının birikimi ile kalınlaşmıştı. Aile postmortem incelemeyi reddettiği için tanının patolojik konfirmasyonu yapılamadı.

Sonuç: Endokardiyal fibroelastozis antenatal dönemde sporadik olarak tanı konulan nadir bir hastalıktır. Sonografik kriterler kötü kontraktiliteli sol ventrikül ve hiperekojen parlak kalınlaşmış endokardiyal yüzeyi içerir. Tanı konduğunda, hastalığın prognozu kötü olduğundan dolayı, fetüs viabilite kazanmadan etkilenmiş gebeliğin termine edilmesi akıllıca olacaktır.

Anahtar Sözcükler: Endokardiyal fibroelastozis; kardiyak; gebelik terminasyonu.

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Introduction

Endocardial fibroelastosis (EFE) is a rare cardiac disorder characterized by diffuse proliferation of elastin and collagen fibers within the endocardium which mainly affects the left ventricle.[1] This mainly leads to decreased compliance and stroke volume. It has been classified as primary and secondary forms according to whether a structural cardiac anomaly is present such as aortic stenosis, coarctation or anomalies at the origin of left coronary artery or pulmonary trunk.[2] In the absence of these anomalies, it's described as primary disease. But most authors consider EFE as a secondary reactive process set off in the endocardium by stress on the myocardium.[3] We present a case of diffuse endocardial fibroelastosis diagnosed at 22 weeks of gestation. The classification and clinical approach to fetal cardiomyopathies based on this syndrome will also be discussed.

Case

A healthy 22 year old primigravid woman had an uneventful pregnancy until the ultrasonographic examination at 22 weeks of gestation. Her past obstetrical and gynecologic history was unremarkable. Fetal echocardiographic evaluation revealed a dilated and hypotonic left ventricle with diffuse hyperechogenic endocardial lining (Figure 1,2). Ultrasonographic examination of the fetus revealed normal aortic and mitral valve diameters and decreased aortic peak systolic velocity and mitral blood flow measurements were determined by doppler ultrasonography investigation. No associated cardiac or systemic anomalies were found on sonography. Parvovirus, coxackievirus infections and genetic or metabolic disorders were excluded. A presumptive diagnosis of EFE was made. Parents were told about the condition of the fetus and they elected to terminate the pregnancy. A male fetus compatible with 22 weeks of gestation with no other dysmorphic features was submitted to autopsy examination but parents refused it. Any other major abnormalities of the fetus was not found at postpartum examination.

Discussion

Cardiomyopathies (CM), account for 8% to 11% of the cardiovascular diagnoses detected prenatally.[4] CM is diagnosed in 3% of newborns with cardiovascular disease.[5] Single gen disorders (Noonan syndrome, metabolic disorders familial CM, congenitale myotonic dystrophy, X-linked myotubular myopathy), mitochondrial disorders, chromosome abnormalities and α

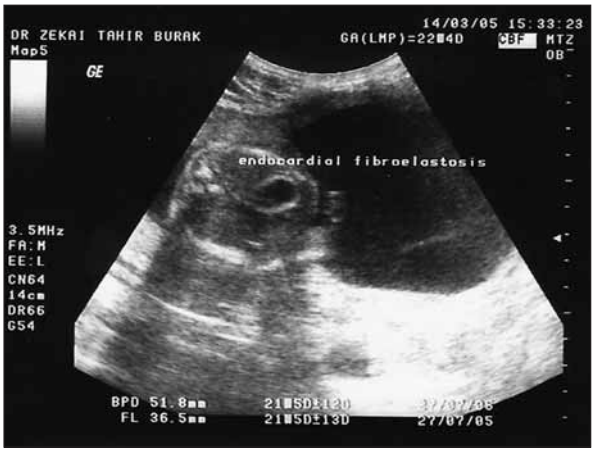

Figure 1. Transverse ultrasonographic view of fetal thorax demonstrating diffuse endocardial thickening with hyperechogenicity.

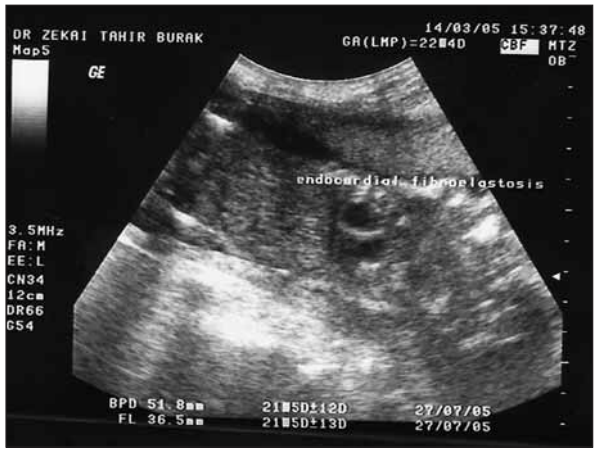

Figure 2. Lateral ultrasonographic view of fetal thorax demonstrating diffuse endocardial thickening with hyperechogenicity.

thalassemia are intrinsic and familial causes of primary CM with recurrence risk. Extrinsic causes of primary CM necessitates the investigation of fetal myocardial dysfunction, maternal hematologic indices and serological workup, amniocentesis if needed and invasive fetal sampling to assess for anemia, thrombocytopenia, high specific IgM titers, viral cultures, and polymerase chain reaction for the specific infectious agent.[6,7]

Secondary CM includes cardiac causes, high output states, altered ventrikülar filling and altered ventrikular afterload disorders. Diastolic dysfunction is associated with the greatest risk of mortality. Left and right ventricular end-diastolic diameters and wall thickness can be measured with M-mode tracings or 2-dimensional images (8,9). In normal fetuses semilunar and atrioventricular valve peak flow velocities gradually increases during pregnancy. Mitrale and tricuspid valves have greater peak A velocity values than peak E velocity values throughout pregnancy. Diastolic dysfunction is considered when at least two of the following parameters are identified: Abnormal E/A ratio through mitral or tricuspid valve inflow (<2 SD below the mean for gestational age), increased duration of isovolumic relaxation time IVRT (>2 SD above the mean for gestational age), increased a-wave reversal in the inferior vena cava or hepatic vein (>20 cm/s) or a biphasic rather than triphasic flow pattern, and the presence of umbilical venous pulsations. Fetal echocardiography with a general fetal anatomic ultrasonographic scan and maternal laboratory investigations to establish the pathogenesis and exclude potentially treatable conditions should be evaluated during fetal CM investigation.[10]

The Tei index is a useful, new, noninvasive Doppler index of combined systolic and diastolic function calculated IVRT plus isovolumic contraction time (IVCT) divided by ejection time (ET). The Tei index readily provides early detection of diminished myocardial function, particularly ventricular dysfunction.[11]

Endocardial fibroelastosis is a rare disorder of newborns accounting for no more than 1-4% of total congenital heart diseases.[3,12] Around 80% of patients present with congestive heart failure within the first year of life.[13] Also one third of patients with clinically diagnosed EFE dies of congenital heart failure during the first 2 years of life. Late deaths occur in the group of patients with clinically resolved EFE.[4]

Classicaly, it has been classified into primary and secondary forms according to whether a structural cardiac anomaly is present since it was first proposed in 1960's. Recently it has been proposed that this was a nonspesific response to many stressors of myocardium such as congenital malformations of vessels and valves, viral agents affecting myocardium e.g. parvovirus, coxackievirus, or genetic disorders, mitochondrial cardiomyopathies and

metabolic disorders. According to this thinking, diffuse intimal fibroelastic thickening of muscular arteries in response to chronic hypertension shares the same mechanism with EFE. When the heart is thought as a kind of modified vascular artery, its response to chronic stres will be the endocardial thickening which corresponds to intima of vessels.[14] Endocardial smooth muscle cells which are normally few in number are seen to proliferate, transform into fibroblasts and produce both collagen and elastin under myocardial stress.

This fibroelastic reaction seems to ocur during fetal development and growth, continuing after birth and throughout early infancy. The reason why this occurs more frequently in that life period is because of greater growth potential of cells at this period. Intestinal hyperechogenisities were also proposed as response to various fetal insults such as infection, hypoxia, vascular disease supporting the ' response to stress' theory.[15]

During the fetal development of EFE, echocardiographic appearance initially demonstrates left ventricular dilatation and hypocontractility with hyperechogenic thickening of endocardial surface as seen in this case. As the gestational age advances, the left ventricular cavity decreases in size, there's a progressive left ventricular wall hypertrophy and an increase in the hyperechogenicity of endocardial surface.[16]

A direct association between the thickness of endocardium and time of onset of myocardial stress was proposed.

Sonographic criteria include a dilated left ventricle with poor contractility and hyperechogenic bright thickening of endocardial surface.[1] According to this, presented case fulfills the both criteria. In differential diagnosis, causes of intracardiac echogenic focus should be included, most importantly Trisomy 21 and 13 which usuall have other morphologic abnormalities.

Since there are controversies related to causes and majority of cases are sporadic as the presented case, a risk population to screen has not been proposed. In the literature, cases reported so far were diagnosed in the second and third trimester, the earliest one being diagnosed at 14 weeks of gestation. Time of diagnosis may be related to the severity of insult and the response of insulted tissue besides the duration of insult meaning under a severe stres, reaction of the tissue can be more prominent leading to early diagnosis.

Conclusion

EFE is a rare disease which sporadically diagnosed during antenatal period. Serial ultrasonographic evaluation is needed since it's a progressive condition which has a spectrum of findings. It should always be remembered that EFE is a response to a disease state rather than being a disease itself. Presence of hypocontractility and hyperechogen endocardium necessitates excluding fetal echocardiography and congenital heart diseases. Since it's a progressive lesion, it has aspectrum of endocardial changes ranging from microscopic thickening to gross changes. When performing screening sonography, this should be kept in mind and special attention should be given to heart even if the previous scan is normal. When diagnosed, it should be wise to terminate the affected pregnancy since the prognosis is poor if it's detected before fetus is viable. If not, remaining antenatal period should be under the control of a pediatric cardiologist and an experienced perinatologist.

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Contents