Retrospective clinical evaluation of indications for termination of pregnancies due to fetal anomaly

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Abstract

Objective: To assess the indications for termination of pregnancy (TOP) in pregnant patients who were followed up with suspicion of fetal anomaly in a Turkish tertiary referral center.

Material and Methods: This retrospective study was carried out in patients who were followed up with suspicion of fetal anomaly between May 2016 and May 2019 at the Perinatology Clinic of Obstetrics and Gynecology Department in Pamukkale University Hospital, which is a tertiary hospital in Denizli province in Turkey. Women were divided into two depending on gestational period: group 1 ≤22 weeks; and group 2 (>23 weeks of gestation).

Results: Four hundred and seventeen pregnant women were evaluated and TOP was performed at a mean gestational age of 27.7±6.3 weeks. There were 308 (73.8%) women in group 1 and 109 (26.2%) in group 2. The decision to terminate pregnancy was due to fetal anomaly in 117 (28.1%). The majority of termination pregnancies in group 2 were performed because of multiple malformations and/or central nervous system defects. All chromosomal diseases were detected in group 1.

Conclusion: With a good perinatal screening program, fetal anomalies can be diagnosed early. Therefore, early TOP is possible. Thus, pregnancy termination can be made before reaching the life limit. (J Turk Ger Gynecol Assoc 2022; 23: 28-32)

Keywords: Fetal anomalies, termination of pregnancy, perinatal diagnosis, congenital anomalies

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Introduction

At present improved assessment of fetal development and fetal anomalies during pregnancy can be performed using advanced transvaginal ultrasonography (USG) techniques and/or routine prenatal follow-up (1). Thus, more accurate information about fetal prognosis is obtained and better counseling can be given. In addition to USG examination, prenatal screening tests are also used for fetal anomaly screening (2). Measurements of the fetal nuchal translucency thickness by USG and double screening tests are used in the routine follow-ups between 11 and 14 weeks of gestation. The triple screening test combined with USG examination is performed at 16 and 18 weeks of gestation in each pregnant woman, who has not been able to do a double screening test earlier and who would like to have screening done. Based on the results of the double screening test, optional chorionic villus sampling (CVS) may be offered when screening has indicated a high risk of fetal anomaly. Alternatively, optional amniocentesis may be performed in women when triple screening indicates a high risk for fetal anomaly. Screening, diagnosis and management of fetal anomalies in pregnancy allows parents to come to terms with the situation and to perhaps plan for the future.

In many countries, termination of pregnancy (TOP) is regulated by law and can be performed without medical treatment due to fetal anomalies. TOPs are permissible, if required up to the 10th gestational week in Turkey since 1983 (3). However, medical evacuation may be performed electively after the 10th gestational week, either in case of serious fetus anomalies or a risk to the mother of serious incurable disease or death as a result of the continuation of the pregnancy. There is no upper limit of the gestational week for medical evacuation,

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and pregnancy can be terminated at any gestational week if there is a serious condition reported by two specialists. In many European countries, TOPs can be performed until term if the presence of serious or fatal fetal anomalies is confirmed. This is the situation in France, England, Wales, Belgium, Finland, Norway (under limited conditions) and Sweden (after approval by the National Board of Health and Welfare).

The aim of this retrospective study was to investigate and discuss the results of incidence and indications for TOPs in pregnant patients followed with suspicion of a fetal anomaly in Pamukkale University Faculty of Medicine, Department of Obstetrics and Gynecology, Perinatology Clinic.

Material and Methods

This study was approved by the Ethics Committee of Non-interventional Clinical Studies of Pamukkale University (approval number: 60116787-020/4318, date: 17.01.2018) and conducted retrospectively in accordance with the Helsinki Declaration. This study included data collected between May 2016 and 2019 from the Perinatology Clinic of the Obstetrics and Gynecology Department, Pamukkale University Hospital, a tertiary hospital of Denizli province in Turkey. Routine prenatal screening/diagnosis was performed in all pregnant women at 20-22 weeks of gestation, as per international and national guidelines. From these records, pregnancies when there was a suspicion of fetal anomaly were identified and included in the study. USG examination was performed using an Esaote MyLab Twice ultrasound diagnostic unit by a perinatology specialist (B.K.). Fetal echocardiography, fetal karyotyping and invasive prenatal tests, followed by genetic counseling were also recommended to patients when necessary. Moreover, a routine universal screening program for gestational diabetes mellitus was carried out for all patients.

Fetal anomalies were classified as congenital malformations, chromosomal abnormalities and genetic abnormalities. Congenital malformations were also defined into subgroups according to affected major organ systems. Pregnant women with a fetus having more than one system-related abnormalities were recorded as multiple anomalies (4).

After the examinations were completed, a decision concerning medical dilation and evacuation was made, taking into account the severity of the abnormality and likely seriousness of handicap, in conjunction with gynecology and obstetrics and related branch specialists. Counseling included information on the termination procedure, in addition to alternative management options. TOPs were performed after obtaining the consensus report which gave detailed information about the fetal anomaly and included parental approval. Oral or vaginal misoprostol induction, with or without oxytocin, was generally used as the main procedure after second-trimester TOP. The route, optimal dose and dosing intervals of misoprostol were chosen based on gestation week, obstetric history, clinical guidelines and practice (5-7). In addition, the need for additional oxytocin for cervical augmentation was determined, based on examinations and clinical conditions. Dilatation and curettage with vacuum aspiration were performed for removal of the retained product of conception due to incomplete or partial expulsion of the fetus and placenta. None of the delivered fetuses were alive. In case of failed induction by misoprostol administration or patients who have had three or more cesarean sections without any medical intervention, a hysterotomy operation was conducted.

All pregnant women with a single fetus who were examined at Pamukkale University Hospital due to suspected fetal anomalies were included in this study. Multiple gestations, unwanted pregnancies and patients whose fetus was not alive during hospital admission were excluded from the study. In addition, pregnant women with a single fetus diagnosed with prenatal fetal anomaly were also evaluated, and they were divided into two subgroups according to the gestational week at which termination was recommended. Also, pregnant women for whom termination was not recommended were divided into two subgroups according to the first examination week. Group 1 contained women with pregnancies up to and including the 22nd gestational week while group 2 included those from the 23rd gestational week onward. Medical records/obstetrical features and demographic information of the patients enrolled in the study were retrieved from the hospital information management system (Probel) and patients' follow-up files.

Statistical analysis

Data were evaluated with SPSS, version 20 (Statistical Package for the Social Sciences, IBM Inc., Chicago, IL, USA). Normality test was performed to apply the appropriate test. Numerical values are shown as mean ± standard deviation, or number and percentage (n, %). Chi-square test and Student's t-test were used in the analyzes. A p-value of 0.05 was assumed to indicate significance.

Results

In this study, a total of 417 pregnant women who were followed with suspected fetal anomalies between May 2016 and 2019 at the Perinatology Clinic of Obstetrics and Gynecology Department in Pamukkale University Hospital were included. During the study period 19,347 patients were examined and 2145 pregnant women delivered. The incidence of TOP in the clinic was 5.45 per 100 live births during the investigation period. The decision for TOP due to fetal anomaly was made in 117 pregnant women. Although detailed advice and information were given about the fetal anomalies, 24 (12.05%) parents

refused TOP and gave birth, of whom there were 18 in group 1 and six in group 2. Six of these pregnancies were longer than 22 weeks of gestation. Of the remaining 117 pregnancies, 105 were in group 1 (≤22 weeks) and 12 were in group 2 (≥23 weeks).

Demographic and clinical characteristics of patients are presented in Table 1. CVS was recommended to 33 (7.9%) pregnant women who were examined with suspicion of fetal anomaly and it was performed in 22 (5.3%). Amniocentesis was performed in one who was recommended CVS but refused it. Also, CVS was performed on one at 12 weeks of gestation and the TOP decision was taken at 23 weeks of gestation.

The mean age in those who terminated pregnancy was similar in group 1 (27.8±6.1) years and group 2 (27.1±8.1) years. Unsurprisingly, the mean gestational age in those who terminated pregnancy was higher in group 2 (24.5±1.3) than group 1 (16.5±3.6). The gestation age range at which TOP was conducted in group 2 was between 23 and 27 weeks. The majority of terminations were conducted between 11 and 22 weeks of gestation (89.74%).

The indications for TOP are presented in Table 2. The most common cause of termination in group 1 (≤22 weeks) was found to be central nervous system anomalies, multiple anomalies, cystic hygroma, cardiovascular system anomalies, chromosome anomalies, whereas it was multiple anomalies and central nervous system anomalies in group 2 (≥23 weeks). The distribution of central nervous system anomalies in group 1 was: spina bifida (n=11) (9.5%); anencephaly (n=8) (6.8%); hydrocephalus (n=6) (5.1%); holoprosencephaly (n=2) (1.7%); corpus callosum agenesis (n=1) (0.8%); and Dandy-Walker malformation (n=1) (0.8%). There were no cases of lung, face or skeletal system abnormalities that resulted in TOP. Trisomy 21 was the most common cause of chromosomal anomalies in group 1 (≤22 weeks), while no chromosomal anomalies were found in group 2 (≥23 weeks). The number of patients with chromosomal and genetic abnormalities was: trisomy 21 (n=5) (4.3%); trisomy 18 (n=2) (1.7%); triploidy (n=1) (0.8%); and thalassemia major (n=3) (2.5%).

In the present study, a vaginal termination induction was achieved (misoprostol with or without oxytocin induction and/or dilatation and curettage) in 114 patients (97.4%), while a hysterotomy was performed in three patients (2.6%). There was no significant maternal morbidity after TOP in the two groups. There were no patients with hysterectomy or uterine rupture in either group.

Discussions

The results of this study show that early diagnosis can be achieved by effectively detecting fetal anomalies before the 22nd gestational week. Thus, termination can be performed and thus minimizing the risk before the period of advanced pregnancy occurs. Furthermore, it was found that pregnant women were more likely to accept invasive procedures in the first weeks of pregnancy. As the pregnancy progressed, it was evident that these pregnant women became less likely to accept invasive procedures, possibly due to their maternal instincts. Early diagnosis of congenital abnormalities is also important for offering parents all choices, including TOP, both for ethical and legal reasons (8,9). Therefore, TOP is a critical decision that should be taken through a multidisciplinary committee with the parents involvement (10,11).

Similar to other studies, multiple malformations and central nervous system anomalies were detected more frequently at advanced gestational weeks (4,12). However, unlike in previous studies, chromosomal anomalies were detected at earlier gestational weeks in our study (13,14). In a study conducted by Aslan et al. (14) in 2007 in Turkey, chromosomal abnormalities were detected at advanced gestational weeks, while they were identified earlier in this study. In addition, and similar to previous studies, the most common chromosomal abnormalities were

Table 1. Demographic and clinical characteristics of pregnant women

Variables	Group 1 (n=308, 73.8%)	Group 2 (n=109, 26.2%)	p
Age (years)	29.2±6.5 (16-45)	26.9±6.2 (16-42)	0.2
Gestational age (weeks)	17.07±3.05 (11-22)	27.6±4.06 (23-38)	<0.01*
Termination (n)	105 (25.2%)	12 (2.8%)	<0.01*
CVS recommended (n)	32 (7.7%)	1 (0.2%)	0.006*
CVS performed (n)	22 (5.32%)	0	0.01*
Amniocentesis recommended (n)	125 (30%)	0	<0.01*
Amniocentesis performed (n)	47 (11.3%)	0	<0.01*
History of fetal anomaly (n)	11 (2.6%)	0	0.04*
Thalassemia (n)	12 (2.8%)	0	0.03*

Data are given as mean ± standard deviation (minimum-maximum) or count and percentage n (%).
*: p<0.05 statistically significant
CVS: Chorionic villus sampling

Table 2. The indications for TOP

	Group 1	Group 2	Total
Central nervous system	29 (24.9%)	6 (5%)	35 (29.9%)
Cystic hygroma	18 (15.3%)	0	18 (15.3%)
Cardiac system	12 (10.3%)	0	12 (10.3%)
Urinary system	3 (2.5%)	0	3 (2.5%)
Gastrointestinal system	3 (2.5%)	0	3 (2.5%)
Multiple anomalies	24 (20.5%)	6 (5%)	30 (25.5%)
Hydrops	3 (2.5%)	0	3 (2.5%)
Anhydramniosis	2 (1.7%)	0	2 (1.7%)
Chromosome anomalies	8 (6.8%)	0	8 (6.8%)
Genetic abnormalities	3 (2.5%)	0	3 (2.5%)
Total	105	12	117
Values are given as n (%), TOP: Termination of pregnancy			

detected by invasive prenatal tests and were trisomy 21 and trisomy 18 (12,14-16). In contrast to earlier studies, cardiac anomalies were found at earlier gestational weeks in our study, which is similar to the detection period of chromosomal anomalies (14-16). However, in later studies, there was a trend to detect cardiac anomalies at earlier gestational weeks, similar to the results of the present study (4,17). This result is thought to be due to wider use of fetal echocardiography and increased experience of fetal cardiac ultrasound examination amongst clinicians. Another reason for detecting chromosomal and cardiac anomalies in earlier gestational weeks may be a positive contribution of the family medicine system. Preventive family medicine system legislation was first introduced in 2004 in Turkey and full national coverage was available after 2010. The system of preventive family medicine provides a closer and more regular follow-up of pregnant women so this is most probably the cause of the difference between earlier studies and this one. In addition, it was found that pregnant women who had experienced fetal anomalies in an earlier pregnancies began early pregnancy follow-up with a concern about fetal anomaly.

In a study conducted by Raupach and Zimmermann (18), the most common causes of fetal anomaly in pregnant women were reported to be cardiac and skeletal system anomalies. In this study, skeletal system anomalies were detected in 2.6% of early gestational week pregnancies and were followed up without termination. Also, the reasons for misdiagnosis of fetal anomaly have been reported in the literature as unfavorable fetal position, oligohydramnios and multiple pregnancy (18).

In this study, 419 pregnant women were clinically followed due to fetal anomaly, 117 of them resulted in termination. In addition, despite clinical advice, 24 (12.05%) women chose to carry the pregnancy to term and deliver. A study from France reported that the proportion who did not accept pregnancy termination was between 6.6-15% (19). The reason for the increase in refusal of pregnancy termination can be explained by the increase in the number of surgical interventions and treatments that increase the survival chance of some fetal anomalies. In addition, fetal anomalies diagnosed in advanced weeks due to delaying of prenatal diagnosis at earlier gestational weeks may survive despite their anomalies due to improvements in newborn care support units and facilities. However, severe anomalies mostly lead to recurrent interventions and increased morbidity and mortality (10,20).

Study limitation

There are some limitations to this study. Since it was a retrospective study, data were obtained from patient records. Another limitation was the relatively small number of patients. There is no upper gestational week limit for TOP according to Turkish law. However, TOP after the 24th gestational week is considered to be unethical according to the Ankara Declaration of the Maternal-Fetal and Perinatology Society of Turkey in 2011 (8,21,22). Therefore, live birth after TOP in the viability zone may be a major problem if the indication is not ethically convincing. In this study, twelve patients (10%) were terminated after the 22nd gestational week because of central nervous system and multiple anomalies, taking into account legal and ethical factors and all 12 fetuses were delivered dead. Although the law permits TOP at any gestational age in Turkey, in practice there is an assumed upper limit for gestational age in terms of ethical termination which seems to be the main reason for this low rate of late TOP.

Conclusion

The establishment of systematic protocols to evaluate fetal organs and systems will be effective in detecting fetal anomalies at early gestational weeks. TOP may be performed after careful and detailed prenatal screening and diagnosis of fetal anomalies, but termination decisions may be affected by national laws, health system, parental education level, socioeconomic status, religious beliefs and cultural beliefs. A decision to terminate should be considered as a multidisciplinary decision with the parent, involving gynecologist and obstetrician, pediatric neurologist as appropriate.

Ethics Committee Approval: *The study was approved by the Ethical Committee of the Pamukkale University Faculty of Medicine (approval number: 60116787-020/4318, date: 17.01.2018).*

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