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A Survey on Leading Indications of Fetomaternal Therapeutic Abortions in Yazd: A Cross Sectional Study

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ABSTRACT

Background: Congenital abnormalities are diseases that occur during fertilization of the egg or development of the fetus and lead to disability, illness or mortality. This study aimed to investigate the prevalence and the factors associated with fetomaternal abnormalities in therapeutic abortions.

Methods: This cross-sectional study was performed on 391 mothers referred to Yazd Legal Medicine Organization for pregnancy termination from March 2017 to March 2020. The data about mothers and their fetuses were extracted and recorded.

Results: The most common fetal abnormalities observed in this study were central nervous system abnormalities (21.1%), subsequently chromosomal disorder (16.8%), hydrops fetalis, cystic hygroma (15.9%), syndromic disorders (10.1%), single-gene disorders (8.1%), dysmorphology (8.1%), musculoskeletal disorders (7.8%), and cardiovascular disorders (7.2%).

Conclusion: The main maternal causes for therapeutic abortion were cardiovascular disease, kidney diseases and cancers, while the most common fetal disorders leading to therapeutic abortion were central nervous system disorders such as anencephaly.

Introduction

Therapeutic abortion is a purposefully pregnancy termination. It may be performed to preserve the mother's physical or mental health or terminate a pregnancy with high risk of severe fetal abnormalities.[1] Indications for pregnancy interruption are debated on policy grounds all over the world. These Indications are divided into fetal or maternal. Some maternal indications are severe heart diseases, neurological disorders, malignancies, renal diseases (hypertension, renal failure), autoimmune and infectious diseases, psychological and psychiatric disorders. Fetal indications include malformations like anencephaly or genetic disorders.[2]

Today, due to the improvement of health conditions in different societies, as well as various vaccination methods, infant mortality by the infections has decreased. However, congenital anomalies have been reported to be the main cause of fatality and lifelong disability in infants in industrialized countries.[3]

According to the World Health Organization (WHO), congenital anomalies include any morphological, biochemical, or molecular defects may develop in the embryo from fertilization to birth. The causes of these anomalies are different. But in general, various social, environmental, racial, and economic factors have contributed to these anomalies.[4] It is estimated that about 30-40% of them are caused by genetic while 5-10% by environmental factors. These anomalies have imposed a heavy burden on the health care system in addition to reducing the quality of life in the families, so the treatment and rehabilitation of people with these disabilities possess a huge cost for society.[5]

According to the WHO, about 3 million fetuses are born with severe anomalies each year that are about 2-3% of all live births.[6]

Although in Iran, fetuses undergo a variety of screening procedures during pregnancy, statistics show that these anomalies are one of the health priorities of infants across the country. More over the most common causes of infant death in the first 5 years of life are these anomalies. In general, the prevalence of congenital anomalies in Iran is estimated 1.7 per 100 live births.[7] However, different prevalence in the diverse regions highlights the role of environmental factors in the abnormalities' incidence. Therefore, the importance of collecting national information on these diseases can provide a significant impact on health system policies, including the prevention of congenital anomalies.[8]

Thus, due to the importance of preventing congenital anomalies and identifying the factors involved in their occurrence, in this study, we considered the prevalence rate and possible causes of congenital anomalies lead to therapeutic abortion in Yazd province according to pregnancy termination licenses in Yazd Legal Medicine Organization.

Materials and Methods

This descriptive cross-sectional study was performed on the pregnant women who were referred to the Yazd Legal Medicine Organization for therapeutic abortion from March 2017 to March 2020. In order to determine the distribution of embryonic problems leading to abortion license, age data, maternal education, and the demographic information related to fetuses such as gender, gestational age and anomaly type were extracted from their medical files. Data were collected and analyzed using SPSS statistical software. All patient information was kept confidential throughout the study.

Results

A total of 391 pregnant women were referred to the Legal Medicine Organization of Yazd province because of fetal disorders to get a legal abortion license from March 2017 to March 2020. The highest amount of abortion was observed in 2017 (46.3%). The median maternal age was 30.25 years (range 15-47 years) and the median gestational age at diagnosis was 16.38 weeks (range 11-27 weeks).

The maximum rate of abortion occurred in the mothers at age range of 25-35 years (57.3%). Rate of abortion was almost equal in 15-25 year-old mothers and mothers older than 35 years old (21.5% and 21.2%, respectively).

The most abortion licenses were related to gestational age of 15-19 weeks (67.0%) and then for 10-14 weeks (31.3%). In 1.7% of the abortions the gestational ages were more than 19 weeks.

Regarding mother's population, 12 people (3.1%) were illiterate, 82 people (21 %) had primary or middle school education, 148 people (37.9%) had a diploma degree, and 148 people (37.9%) had higher degree than diplomas. About 334 (85.4%) of mothers were housewives (Table 1).

Table 1. Characteristic of women referred for therapeutic abortion

Variable	Frequency	Percent
Maternal Age		
15-25	84	21.5
25-35	224	57.3
>35	83	21.3
Total	391	100
Level of Education		
Illiterate	12	3.1
Primary and middle school	83	21.0
Diploma	148	37.9
Higher education	148	37.9
Total	391	100
Occupation		
Housewife	334	85.4
Others (employed, self-employed)	57	14.3
Total	391	100
Gestational age (weeks)		
< 15	113	28.9
15-19	242	61.9
> 19	6	1.5
Unknown	30	7.7
Total	391	100

Among all the reasons leading to therapeutic abortion, 45 cases (11.5%) were maternal disorders and 346 cases (88.5%) were fetal abnormalities (Figure 1). The gender of the aborted fetuses in 73 cases (18.7%) were male, 81(20.7%) female and 237 cases (60.6%) were unknown.

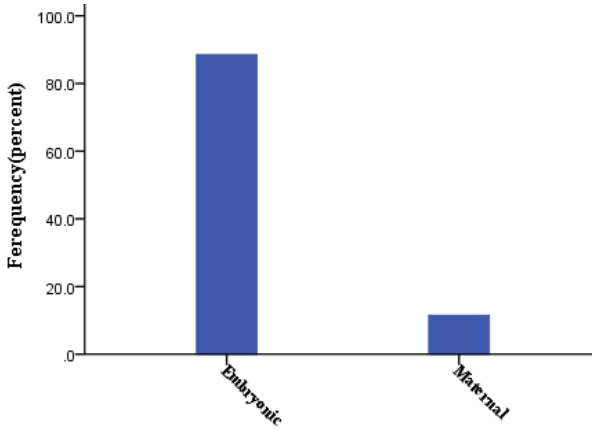

Figure 1. Distribution of indications for therapeutic abortions in women referred to the Yazd Legal Medicine Organization

In case of the frequency distribution of fetal disorders, 73 cases (21.1%) of abortion licenses were related to central nervous system (CNS) disorders. After that, chromosomal disorders (16.8%) and hydrops fetalis (15.9%) were the main fetal abnormalities indicated for abortion (Figure 2 and Table 2). Down syndrome (11.5%) was the main among the chromosomal disorders and major beta-thalassemia (3.1%) remained the prominent abnormality of single-gene disorders. Omphalocele also called exomphalos (3.2%) and hypoplastic heart syndrome (3.4%) were the main abnormality of gastrointestinal and cardiovascular systems, respectively.

Table 2. Distribution of fetal abnormalities

Abnormality	Frequency	Percent
Central nervous system	73	21.1
Chromosomal disorder	58	16.8
Hydrops fetalis	55	15.9
Syndromic disorder	35	10.1
Single gene disorder	28	8.1
Dysmorphology	28	8.1
Musculoskeletal system	27	7.8
Cardiovascular systems	25	7.2
Gastrointestinal system	9	2.6
Genitourinary system	8	2.3
Total	346	100

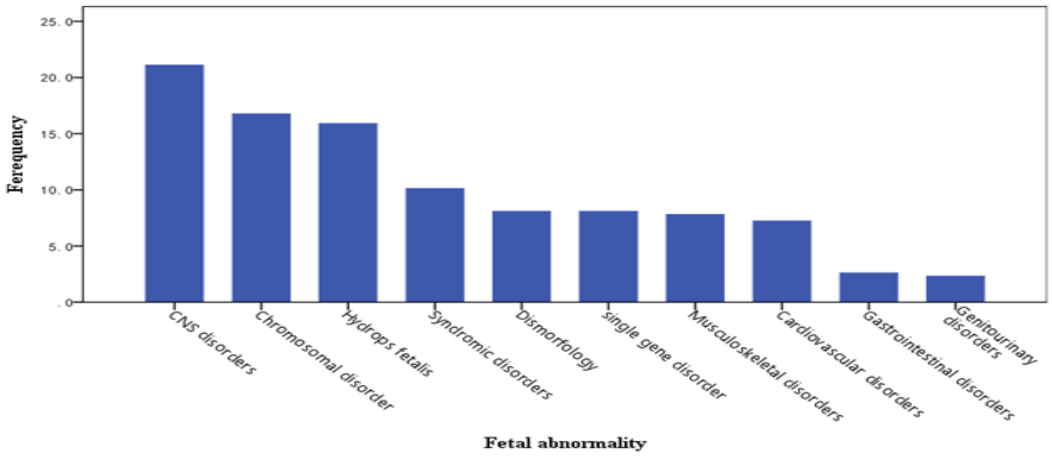

Figure2. Distribution of therapeutic abortions according to fetal indications

The main maternal causes for legalized abortion were cardiovascular disease, kidney diseases, and cancers. None of the mothers suffered from viral or bacterial infectious diseases. The most common method for diagnosing prenatal abnormalities was ultrasonography.

Discussion

Therapeutic abortion is an extreme and painful decision. No one can recommend it as an ideal decision but it is part of an un-avoidable social necessity which is only comparable to euthanasia. According to the United Nations Population Division (UNPD), legislation in almost all countries permits abortion to save the woman's life. In more than three-fifths of countries, abortion is also allowed to preserve the physical and mental health of the women.[9]

Congenital anomalies or birth defects are mentioned as a set of structural, functional, or metabolic disorders of the fetus at birth. These diseases can be caused by chromosomal or environmental factors or special nutritional deficiencies[10] and they are counted as the main cause of infant death in industrialized countries.[11] Furthermore, they are frequently diagnosed before birth, so they can be detected by routine prenatal examination, including sonography. Ultrasound scanning is the most important tool for prenatal diagnosis of structural congenital defects. It detects the majority but not certainly all the congenital abnormalities.[12]

In recent decades, advances in the prenatal diagnosis of chromosomal disorders and birth defects including ultrasonography, amniocentesis, chorionic villous sampling, and noninvasive prenatal testing (NIPT) are available. Prenatal diagnosis is offered as a routine medical test in order to initial detection of fetal anomalies in high-risk pregnant women who have an increased chance of having an infant with a disorder.[13] More recently, new markers and strategies for Down syndrome screening, such as nuchal translucency measurement and serum markers, have been developed.[14] However, an accepted goal of prenatal testing is providing the parents a choice of avoiding the birth of an affected child. Even though, prenatal diagnosis has enabled couples to prevent the birth of an unhealthy baby and decrease the incidence of newborns with anomalies. On the other hand, the incidence of termination of pregnancy because of fetal anomalies is increasing year by year.[15]

In Iran, estimates show that the congenital diseases occur in seven percent of births.[16] According to previous studies the most ordinary anomalies are genital, urinary, renal, cardiac, nervous system disorders and limb abnormalities among Iranian population.[17]

According to the reports of the WHO, the highest mortality occurred during 28 days after birth due to congenital anomalies, and among

all these anomalies, neural tube defects were the most common and problematic congenital anomalies.[18]

In Iran, according to an investigation that was performed in Isfahan from 2012 to 2014, the most abortion indications were cephalic disorder, hydrops fetalis and chromosomal rearrangements, respectively.[19] Another study in 2017 in Hormozgan province revealed that the most common indication in mothers requiring abortion were renal disorders, cardiovascular diseases, breast cancer, and hypertension. Moreover, the main neonatal disorders were central nervous system disorders (including anencephaly and microcephaly) and major thalassemia.[20] In the previous published study by Khajenoori et al., from 2014 to 2016 in Yazd, the most prevalent fetal abnormalities indications for abortion were central nervous system disorders (anencephaly and spina bifida), hydrops fetalis and Down syndrome, respectively and the most frequent maternal disorders were cardiovascular diseases in pregnant women.[7]

Conclusion

This study showed the high prevalence of therapeutic abortion because of fetal anomalies. In order to reduce the rate of anomalies in live birth, it is substantial to pay attention to several issues: central nervous system disorders are the most common birth anomalies. Regarding the true burden of nervous system anomalies, family education is highly recommended to prevent such births. Additionally, many anomalies were due to genetic and chromosomal defects and screening tests before and during pregnancy are very effective in preventing such problems. Therefore, the importance of examining fetal health status during pregnancy before the 20th week is extremely emphasized.

Conflict of Interests

Authors have no conflict of interests.

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