ETHICAL CONSIDERATIONS IN SCREENING AND ULTRASOUND DIAGNOSIS OF FETAL HEART DEFECTS

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Abstract
Congenital heart defects take an important place in fetal pathology, due to their highest death percentage reported by WHO (World Health Organisation). The ethical issues that obstetricians deal with in case of an isolated fetal heart abnormality are multiple. The obstetrician is most of the time overwhelmed by the real possibility of making a fetal or neonatal prognosis. The lack of complete and correct information of the couple raises its expectations for the new born without knowing the limits and possibilities of cardiology therapy or surgical cardiology. That is why medical ethics requires a detailed, individualized presentation to the couple of the possibilities of further therapy for the new born, which is a real benefit for the couple’s decision. In conclusion, the ethical issues raised by heart anomalies diagnosed in uterus are multiple, exceed the performance of the specialty of obstetrics and gynaecology. Sending these cases of suspected fetal heart abnormalities detected in the early pregnancy to centers specialized in in-utero diagnosis and neonatal heart therapy is a necessity.
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According to various authors, congenital heart defects vary between 4–13 per 1,000 live births [1, 2, 3, 4, 5, 6, 7, 8]. If we add minor abnormalities such as bicuspid aortic valve, left superior vena cava, isolated aneurysm of atrial sept, the incidence reaches 5% [9, 10]. Between 1950 and 1994, the World Health Organization reported that a percentage of 42% of child mortality cases caused by heart defects [11].

The percentage of prenatal diagnosis of cardiac abnormalities varies between 17.9 and 55.6%, and most of them were diagnosed between 20 and 24 weeks. [12]. The diagnosis of fetal heart isolated anomalies remains under 50% [13]. The increased percentage of in-utero diagnosis of fetal heart defects is due to the training of ultrasound specialists and the increasing resolution of equipment [14]. The factors influencing the diagnosis of fetal heart abnormalities are related to the training of ultrasound specialists, the complexity of lesions and other structural chromosomal abnormalities, patient's body mass [15].

A frequent issue of diagnosis is the association with chromosomal anomalies (for example - 50% of fetuses diagnosed with common atrioventricular canal, have Down Syndrome) [16]. 30 to 40 % fetuses with heart abnormalities present an abnormal karyotype [17, 18, 19]. That is why the presentation of the fetal karyotype is absolutely necessary in case of fetal heart abnormalities.

In 2006, the International Society of Ultrasound in Obstetrics and Gynaecology (ISUOG) published the first guidelines on fetal echocardiography screening [20]. This moment coincided with the belated organization of echocardiography courses in more and more centers. Although heart abnormalities can be observed at the fetal screening of 18-22 week pregnancies and subsequent ultrasound tests in more advanced pregnancy stages do not reveal additional structural data [21], ultrasound tests in the third trimester are useful in assessing any possible complications (for example a progressive failure of a tricuspid valve with severe dysplasia). Neonatal results are obviously better for the fetuses with known antepartum diagnosis, especially in case of complex defects such as transposition of great arteries, abnormalities dependent of arterial canal persistence [22, 23]. There are abnormalities of aorta coarctation type that can be detected in the in-utero diagnosis stage, even when they are suspected or associated with other heart abnormalities [24]. The ultrasound tracking of a fetal heart pathology is necessary for choosing between the labor and delivery options, and a planned caesarean section [25].

Although the screening of fetal heart defects, in some maternal pathologies, starts at 11-12 weeks gestational age (for example-diabetes, history of pregnancy with fetal heart defects, and so on, or once again with the measurement of nuchal fold) [26, 27], the abnormal fetal cord is often diagnosed in the second trimester of pregnancy. In the absence of a national program on fetal heart defects screening, there are centres in our country where the patients are usually sent to in the 3rd trimester of pregnancy. [28, 29]. If a pregnant woman is less informed about any
detected abnormalities, the fetal screening has a major psychological impact on her decision-making [30].

The pregnant patient, and the couple, must be completely informed about the diagnosis, in order to help them making a decision regarding the evolution of the pregnancy. The legislation of our country (whereas abortion is allowed after the 3rd month of pregnancy, if it is necessary or one of the parents suffers from a serious disease that can be inherited or leads to severe congenital defects) regarding the maximum gestational age and therapeutic abortion - decree-law no. 1 of December 26, 1989, CFSN - is quite ambiguous. This puts the obstetrician in a difficult ethical situation when the couple wants the abortion of a fetus with fetal heart defect in the 2nd trimester of pregnancy (gestational age is 24 weeks) -is this compatible with life or not, or is it legally considered a severe congenital abnormality?, given that the European laws consider them as births, and a large number of fetal heart defect cases are redirected, after that period, to a centre where the patient receives details on the complexity of diagnosis and medical advice. The obstetrician is, most of the times, overwhelmed by the real possibility of making a fetal or neonatal prognosis.

The ethical issues dealt with by the obstetrician are multiple, when facing an isolated fetal heart abnormality. Firstly, the couple should be informed that most of the fetal heart defects are complex and the heart disease severity will be known after birth. Another problem is the possible evolution of the disease starting with intrauterine – for example tricuspid dysplasia with insufficiency or with an extremely severe impact on the new born- hypoplastic left heart syndrome, hypoplasia marked by arterial pulmonary trunk. It is known that many of the abnormalities related to the left hypoplastic cord generate a decreased brain flow and brain circumference at birth [31, 32], so the couple must be warned about the possible implications on the development of other fetal organs. The complexity of some heart abnormalities –for example the association of left ventricular hypoplasia with atrioventricular left defect, with transposition of great arteries and hypoplastic aortic crosa raises complex problems in cardiac surgery, with repeated number of surgeries at different postnatal ages, sometimes with te following result- a single functional ventricle for the rest of their life. Relatively minor abnormalities, isolated, as the septal ventricular defect, can be described to the couple as cases with a probably good prognosis during the postnatal life.

The medical advice should comply with the ethical framework, whereas suggesting the abortion as the only solution is not allowed. On the other hand, in case of a single isolated fetal heart abnormality, the medical advice cannot provide an accurate prognosis of normal neonatal life after a possible cardiac surgery. The lack of complete and correct information of the couple brings the patient in a position of high hopes for the new born without knowing the limits and possibilities of cardiology therapy or surgery. That is why medical ethics requires the detailed, customized presentation to the couple of further therapy options for the new born, which is a real benefit for the couple’s decision. Medical interdisciplinary consultation
– obstetrician, neonatologist, paediatric cardiologist, cardiovascular surgeon, anaesthetist-intensive care specialist, at a very early gestational age, is a real benefit for the couple’s decision. In the presence of chromosomal abnormalities, medical advice should contain a compulsory genetic consultation.

To conclude, the ethical issues raised by heart anomalies diagnosed in uterus are multiple, and exceed the performances of the obstetrics and gynaecology specialty.

Sending these suspected fetal cardiac anomalies, as early as possible, to the centers specialized in in-utero diagnosis and neonatal heart therapy is a necessity. Interdisciplinary medical cooperation and detailed information of couples may solve a good part of these ethical problems, and improve the detection of fetal cardiac abnormalities.

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123


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