The significance of screening and prenatal diagnosis of congenital heart disease

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Abstract

Congenital heart disease is the most important cause of infant mortality. Abnormalities of the heart and great arteries are the most common congenital defects. Congenital heart disease is often fallow by extracardiac malformations. Many studies revailed positive impact of prenatal diagnosis and timelly treatment on pre-operative condition and outcome of surgery and long term prognosis. Neverthelles, structural cardiac anomalies were also among the most frequently missed abnormalities by prenatal ultrasonography at mid-trimester scan. The 4-chamber view has a Detection Rate of 6-50%, with a reasonable figure of 20% in community setting screening programs. The addition of the outflow determines a significant increase of the Detection Rate which, in most studies, ranges 20-40%. The three-vessel view allows to detect major abnormalities of the arches, the neck vessels and the thymus. The prenatal detection of specific types of congenital heart disease, such as Transposition of great arteries, Hypoplastic left heart syndrome, Tetralogy Fallot, seems to have a significant impact on survival, hospital stay and pre-operative conditions of the affected neonates. Hence, fetal cardiac screening is a must for all health professionals involved in prenatal diagnosis.

Key words: congenital heart disease, echocardiography, screening

Congenital heart disease (CHD) is the most important cause of infant mortality, with an estimated incidence of about 4-13 per 1000 live births[1-3]. During the second half of the 20th century more then 40% of infant deaths reported to the World Health Organization were attributable to cardiac defects[4]. Also, Their importance lies in the high incidence, the highest among congenital fetal abnormalities. Abnormalities of the heart and great arteries are the

Značaj skrininga i prenatalne dijagnoze kongenitalne srčane bolesti

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Apstrakt

Kongenitalna srčana bolest je najznačajniji uzrok mortaliteta odojčadi. Anomalije srca i velikih krvnih sudova su najčešće kongenitalne anomalije ploda. Često su praćene ekstrakardijalnim malformacijama. Mnoge studije su dokazale pozitivan uticaj prenatalne dijagnoze i pravovremenog lečenja na preoperativno stanje, ishod operativnih procedura i dugoročnu životnu prognozu. Uprkos svemu ovome, strukturne srčane anomalije su među onima čija dijagnoza najčešće izostane tokom prenatalnog obstetričkog ultrazvučnog pregleda u drugom trimestru trudnoće. Brojne studije su pokazale da pregled četvorokomornog preseka srca detektuje kongenitalnu srčanu bolest u opsegu od 6-50%, a najveći broj studija govori o detekciji od oko 20%. Dodatni pregled srca u oba izlazna komorna trakta dovodi do značajnog porasta stope detekcije, a ona se u najvećem broju studija kreće od 20-40%. Pregled na nivou preseka tri krvna suda omogućava detekciju velikih anomalija aortnog i duktalnog luka, krvnih sudova vrata i timusa. Prenatalna detekcija nekih vrsta kongenitalne srčane bolesti, kao što su transpozicija velikih krvnih sudova, sindrom hipoplastičnog levog srca i Tetralogija Fallot, ima pozitivan uticaj na preživljavanje, dužinu hospitalizacije i preoperativno stanje afektirane dece. Zbog svega navedenog, prenatalni skrining kongenitalne srčane bolesti je obaveza svih lekara uključenih u procese prenatalne dijagnostike.

Ključne reči: kongenitalna srčana bolest, fetalna ehokardiografija, skrining

Kongenitalna srčana bolest (KSB) je najznačajniji uzrok mortaliteta odojčadi, a njena incidenca se procenjuje na čak 4-13 na 1000 živorođene dece[1-3]. U evidenciji Svetske zdravstvene organizacije je zabeleženo da je u drugoj polovini dvadesetog veka više od 40% smrtnih slučajeva dece bilo uzrokovano srčanim defektima[4].

most common congenital defects, and they account for about 20% of all stillbirths and 30% of neonatal deaths due to congenital defects[5]. Their incidence is more then 6 times greater than chromosomal anomalies and 4 times that of neural tube defects. The value of prenatal detection of CHD is that it may improve the pregnancy outcome of fetuses with specific types of cardiac lesions[6-10], such as aortic coartaction, left heart obstruction, transposition of the great arteries, hypoplastic left heart syndromes. Many studies revailed positive impact of prenatal diagnosis and timelly treatment on pre-operative condition and outcome of surgery and long term prognosis. Delayed diagnosis of congenital heart disease worsens pre-operative condition and outcome of surgery in neonates[11]. Also, regarding neuro-developmental outcomes and long term outcomes, it has been found that preoperative cerebral blood flow is diminished in neonates with congenital heart defects if left prenataly undiagnosed and postnataly preoperatively unthreated[12,13].

The significance of screening and prenatal diagnosis of congenital heart disease also lay in the fact that CHD is often fallow by extracardiac malformations. Extracardiac malformations are present in 25 to 45% of children with congenital heart disease[14]. Extracardiac malformations are more common in children with atrioventricular septal defects, other septal defects, heterotaxy syndromes and conotruncal defects; less common in left heart defects and uncommon in transposition of the great arteries. Increased nuchal translucency without chromosomal abnormalities is associated with cardiac defects, especially narrowing of the aorta[15]. Twins are not a malformation but monozygotic twins do have twice the incidence of congenital heart disease seen in dizygotic twins and the concordance rate is higher[14,16]. In conjoined twins, those with thoracopagus or thoraco-omphalopagus have a 75% incidence of congenital heart disease usually involving shared structures between the two hearts. In most of the others the pericardium is shared. Even in omphalopagus, congenital heart disease is found in at least one twin in 25%[14,16].

Neverthelles, structural cardiac anomalies were also among the most frequently missed abnormalities by prenatal ultrasonography at mid-trimester scan [17,18]. Prenatal detection rates have varied widely for CHD[19]. Some of this variation can be attributed to examiner experience, maternal obesity, transducer frequency, abdominal scars, gestational age, amniotic fluid volume, and fetal position[20,21]. Continuous

Incidenca KSB je ubedljivo najveća među svim kongenitalnim fetalnim anomalijama. Anomalije srca i velikih krvnih sudova su prisutne u oko 20% mrtvorođene dece i u 30% svih neonatusa umrlih usled kongenitalnih defekata[5]. Incidenca KSB je 6 puta veća od hromozomskih anomalija, a 4 puta od defekata neuralne tube. Značaj prenatalne dijagnostike je u tome što ona poboljšava prognozu nekih tipova kongenitalnih srčanih lezija[6-10], kao što su koarktacija aorte, obstrukcija levog srca, transpozicija velikih krvnih sudova i sindrom hipoplastičnog levog srca. Mnoge studije su dokazale pozitivan uticaj prenatalne dijagnoze i pravovremenog lečenja na preoperativno stanje, ishod operativnih procedura i dugoročnu životnu prognozu. Zakasnela dijagnoza nekih vrsta srčanih anomalija pogoršava preoperativno stanje i ishod operativnih intervencija[11]. Kod nekih prenatalno nedijagnostikovanih anomalija, dokumentovano je smanjenje preoperativnog protoka krvi kroz mozak. Ono je posledica izostalog adekvatnog postnatalnog preoperativnog tretmana i uticalo je na neurološki razvoj i pojavu dugoročnih sekvela[12,13].

Važnost skrininga i prenatalne dijagnostike KSB se ogleda i u činjenici da je ona često praćena ekstrakardijalnim malformacijama. One su prisutne u 25 do 45% dece sa kongenitalnom srčanom bolešću[14]. Ekstrakardijalne malformacije su češće u dece sa atrioventrikularnim septalnim defektima, drugim septalnim defektima, heterotaksičnim sindromom i konotrunkalnim anomalijama; ređe se javljaju u levostranim srčanim manama, a veoma retko u slučaju transpozicije velikih krvnih sudova. Zadebljanje nuhalne translucence fetusa sa urednim kariotipom je često povezano sa srčanim defektima, naročito sa stenozom aorte[15]. Monozigotni blizanci imaju dvostruko veću incidencu kongenitalne srčane bolesti u odnosu na dizigotne blizance[14,16]. Sijamski blizanci sa thoracopagusom ili thoraco-omphalopagusom imaju incidencu KSB od 75%, koja se uglavnom odnosi na zajedničke strukture ova dva srca. U najvećem broju slučajeva zajednički je perikardijum. Čak i u slučaju omphalopagusa, kongenitalna srčana bolest se sreće bar u jednog blizanca u 25% slučajeva[14,16].

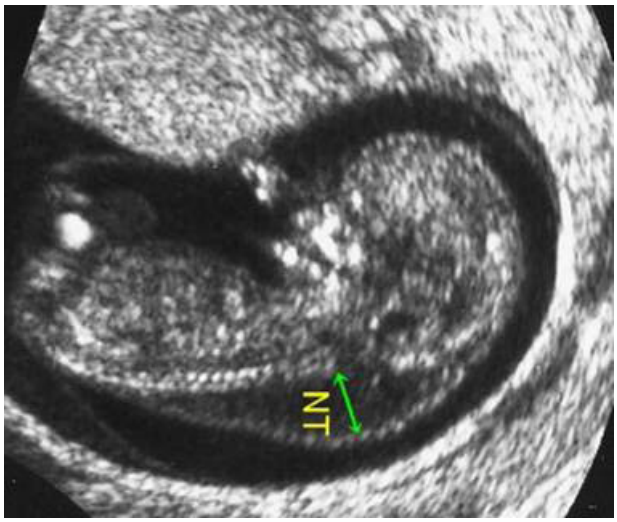
Uprkos svemu ovome, strukturne srčane anomalije su među onima čija dijagnoza najčešće izostane tokom prenatalnog obstetričkog ultrazvučnog pregleda u drugom trimestru trudnoće[17,18]. Stope prenatalne dijagnoze KSB široko variraju[19]. Varijacije mogu biti posledica znanja i iskustva ultrasonografiste, maternalne gojaznosti, primenjene frekvence ultrazvučne sonde, abdominalnih ožiljaka, gestacione starosti,

training of health-care professionals based on feedback, a low threshold for echocardiography referrals and convenient access to fetal heart specialists are particularly important factors that can improve the effectiveness of a screening program[3,22]. As one example, the major cardiac anomaly detection rate doubled after implementing a two-year training program at a medical facility in Northern England[23].

Screening tools for prenatal diagnosis of CHD are NT, basic and extended fetal cardiac ultrasound examinatios.

Nuchal translucency screening (Figure 1) has been shown to be very effective in identifying fetuses at increased risk for both chromosomal anomalies and cardiac malformation.

Three to five percent of tested fetuses will be defined as being at high risk for congenital heart disease following nuchal translucency examination[24,25,26]. This creates a new population of considerable size that would be candidates for complete fetal echocardiography[27]. A meta-analysis of studies examining the screening performance of NT thickness for the detection of cardiac defects in fetuses with normal karyotype, reported that the detection rates were about 37% and 31% for the respective NT cutoffs of the 95th and 99th centiles[28]. This compares favorably with the 10% detection rate achieved by confining specialist fetal echocardiography to pregnancies with a maternal history of diabetes mellitus or exposure to teratogens and family history of cardiac defects[29]. Increased NT is not confined to specific types of cardiac defects, whereas examination of the four-chamber view of the heart in the second trimester is not effective in the identification of fetuses with tetralogy of Fallot, transposition of the great vessels, coarctation of the aorta, and some other lesions. It is therefore possible to combine the two methods of screening (first-trimester NT and



Slika 1. Vratno zadebljanje ploda i prikaz mesta na kojem se ono meri

Figure 1. Head knob and display places the fetus where it is measured

količine plodove vode i fetalnog položaja u momentu ultrazvučnog pregleda[20,21]. Kontinuirana edukacija i trening lekara u oblasti fetalne ehokardiografije, nizak „prag" za upućivanje na ovu dijagnostičku proceduru i laka dostupnost specijalistima fetalne kardiologije su bitni faktori koji mogu poboljšati efikasnost skrining programa[3,22]. Kao primer se navodi implementacija dvogodišnjeg trening programa zdravstvenih radnika u severnoj Engleskoj, što je za posledicu imalo dupliranje stope detekcije velikih srčanih mana[23].

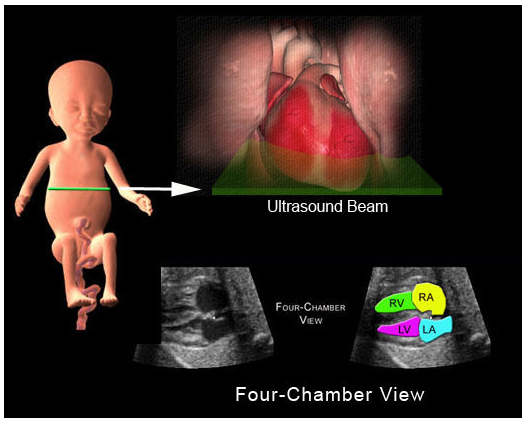
Skrining opcije za prenatalnu dijagnozu KSB su merenje nuhalne translucence (NT), bazični i prošireni bazični ultrazvučni pregled fetalnog srca.

Skrining merenjem nuhalne translucence tokom prvog trimestra (Slika 1.) se pokazao veoma uspešnim u otkrivanju fetusa sa povećanim rizikom hromozomskih abnormalnosti i srčanih malformacija.

Tri do pet procenata pregledanih fetusa će biti označeno kao fetusi sa visokim rizikom KSB, a na osnovu merenja nuhalne translucence[24,25,26]. Ovo čini novu i veliku populaciju kandidata za kompletnu fetalnu ehokardiografiju[27]. Meta-analiza studija za procenu merenja vratnog zadebljanja kao skrining testa za detekciju KSB u fetusa sa normalnim kariotipom, pokazala je da su stope detekcije bile oko 37% i 31% u odnosu na NT cut-off vrednosti 95. i 99. centila[28]. Ovo je znatno bolje od stope detekcije od 10% postignute fetalnom ehokardiografijom trudnica sa dijabetes melitusom, onih izloženih dejstvu teratogena i onih sa KSB u porodičnoj anamnezi [29]. Povišena vrednost NT-a nije vezana za neki specifičan tip KSB, dok ultrazvučni pregled fetalnog srca na nivou četvorokomornog preseka tokom drugog trimestra nije efikasan u identifikovanju fetusa sa Tetralogijom Fallot, transpozicijom velikih krvnih sudova, koarktaciom aorte i još nekim drugim lezijama. Zato bi kombinacija ove dve metode skrininga (merenje NT-a u prvom i pregled četvorokomornog preseka srca u drugom trimestru) poboljšala antenatalnu detekciju velikih srčanih defekata[30].

second-trimester four-chamber view) to improve the antenatal detection of major cardiac defects[30]. Centers offering nuchal translucency screening would therefore be expected to complement this with comprehensive echocardiography.

Despite the well-documented utility of a four-chamber view (Figure 2), one should be aware of potential diagnostic pitfalls that can prevent timely detection of CHD[18]. While attracted attention as innovative and effective at its introduction, the four-chamber view and the basic cardiac ultrasound exam of the fetal heart, when used alone as a screening tool, reveals only some cardiac anomalies[31-35].



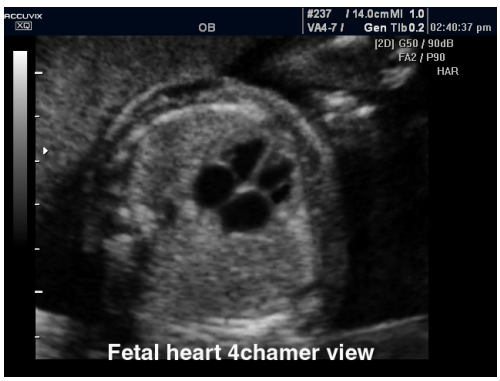
Slika 2. Prikaz mesta četvorokomornog preseka srca i njegov ultrazvučni izgled

Legenda: RV- desna komora; RA- desna pretkomora; LV- leva komora; LA- leva pretkomora

Figure 2. Fourchamber view section of the hear and its ultrasonographic appearance

Legend: RV-right ventricul; RA-right atrium; LV- left ventricul; LA - left atrium

Detection rates can be optimized by performing a thorough examination of the heart, recognizing that the four-chamber view is much more than a simple count of cardiac chambers, understanding that some lesions are not discovered until later pregnancy, and being aware that specific types of abnormalities (e.g. transposition of the great arteries or aortic coarctation) may not be evident from this scanning plane alone. Faced with discouraging false-negative rates, many centers introduced scanning of the great vessels' outflow tracts (Figure 3. and Figure 4.) and some aditional fetal scan views (Figure 5.), incorporated as extended basic fetal cardiac ultrasound examination as part of their screening programs. This improved detection rates.



Slika 3. Četvorokomorni presek srca

Figure 3. Fourchamber view section of the heart

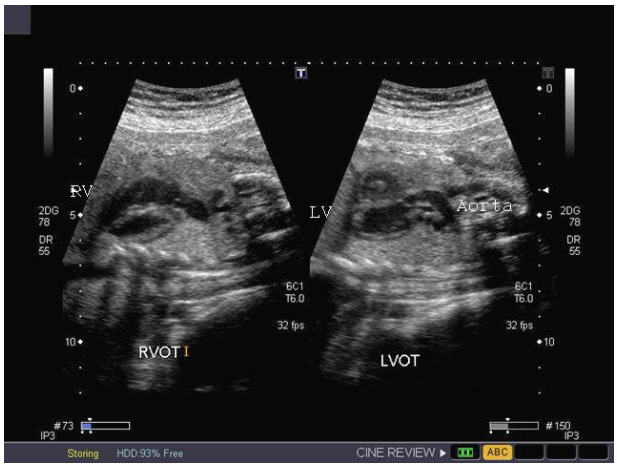
Centri u kojima se vrši skrining NT-om bi morali u ponudi imati i njemu komplementaran pregled, a to je fetalna ehokardiografija.

Uprkos dokumentovanom značaju pregleda srca u četvorokomornom preseku (Slika 2. i 3.), bitno je znati njegove potencijalne dijagnostičke nedostatke, koji mogu onemogućiti pravovremenu dijagnozu KSB[18].

Iako je u momentu uvođenja u kliničku praksu predstavljen kao inovativan i efikasan, bazični ultrazvučni pregled fetalnog srca na četvorokomornom preseku otkriva samo neke vrste srčanih anomalija[31-35]. Stope detekcije KSB ovim pregledom se mogu poboljšati njegovim paživim i sveobuhvatnim izvođenjem. Mora se imati u vidu da četvorokomorni presek srca ne služi samo za prosto prebrojavanje srčanih šupljina, da se neke lezije mogu otkriti tek u odmakloj trudoći i ne zaboraviti da se specifični tipovi srčanih anomalija (npr. transpozicija velikih krvnih sudova i koarktacija aorte) ne mogu otkriti pregledom srca u ovom preseku. Zato su mnogi centri, suočeni sa obeshrabrujuće visokim lažno-negativnim stopama KSB na četvorokomornom preseku, uveli i pregled oba izlazna komorna trakta (Slika 4.) i još neke dodatne preseke (slika 5.) kao deo njihovih skrining programa. Ovo je nazvano prošireni bazični pregled fetalnog srca i imalo je za rezultat značajno veće stope prenatalne detekcije kongenitalne srčane bolesti.

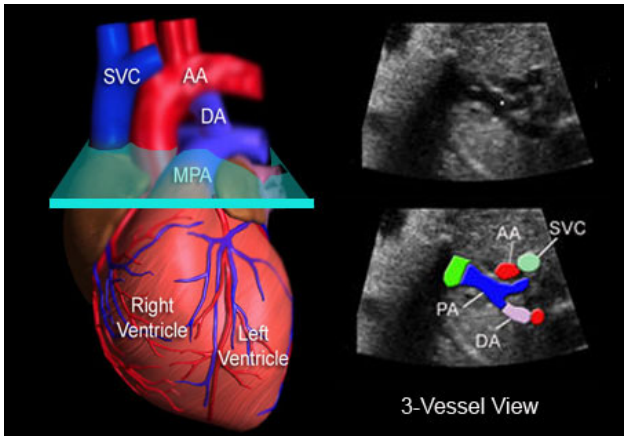
The basic and extended basic cardiac ultrasound examinations are designed to maximize the detection of heart anomalies during a second-trimester scan[36]. These guidelines can be used for evaluating low risk fetuses that are examined as a part of routine prenatal care[37-39]. This approach helps to identify fetuses at risk for genetic syndromes and provides useful information for patient counseling and thorow obstetrical evaluation.

If even after these facts which are presented by the present level of medical science there are still questions why the CHD screening is not performed after delivery, we will try to find a response in several clinical, practical and real life examples. One of them is a study by Wren and associates[40] where it was demonstrated that out of 4444 children with CHD, 669 of them had life threatening conditions. In only 55 of them it was recognized prenatally while 416 were discovered postnatally during hospitalization. Even in 198 children a life threatening diagnosis was determined postnatally but only after discharge from hospital. 168 of them survived and 30 died after being discharged from the hospital without a diagnosis. If this does not provide sufficient evidence for application of the screening, there are a few more perinatologic benefits of antenatal diagnosis:



Slika 4. Desno je prikaz leve komore i aorte kako iz nje izlazi. Primetiti kako je prednji aortni zid u kontinuitetu sa interventrikularnim septumom. Slika levo pokazuje desnu komoru i kako iz nje izlazi truncus arteriae pulmonalis.

Figure 4. To the right is the view of the left ventricle and aorta to coming from it. Noted that the anterior aortic wall interventricular septum with continuity. Image left shows the left ventricle as coming from it truncus Arteriae TPA.



Slika 5. Prikazuje mesto preseka i izgled posmatranih struktura na nivou preseka 3 krvna suda

Legenda: SVC- gornja šuplja vena; AA- aorta ascendens; DA- ductus arteriosus; PA- trunkus arterije pulmonalis

Figure 5. Shows the location and appearance of the studied section structure at the intersection of three blood vessels.

Legend: SVC-upper vena cava, AA - aorta ascendens; DA - ductus arteriosus; PA-truncus arteries pulmonary

Bazični i prošireni bazični ultrazvučni pregled fetalnog srca dizajnirani su da maksimalizuju stopu detekcije srčanih anomalija tokom obstetričkog ultrazvučnog pregleda u drugom trimestru trudnoće[36]. Oni se mogu koristiti kao deo rutinske prenatalne kontrole i evaluacije svih fetusa, pa tako i onih sa niskim rizikom pojave KSB[37-39]. Ovakav pristup omogućava identifikaciju fetusa sa rizikom postojanja genetskih sindroma i omogućava korisne informacije i detaljnu obstetričku evaluaciju.

Ako i nakon ovih činjenica koje prezentuje sadašnji nivo medicinske nauke, neko i dalje ima dilemu zašto se skrining KSB ne obavlja nakon porođaja, odgovor ćemo pokušati dati na nekoliko kliničkih, praktičnih i životnih primera. Jedan od njih je studija Wrena i saradnika[40] u kojoj je pokazano da je od 4444 dece sa KSB, njih 669 imalo životno-ugrožavajuće stanje. Ono je samo u njih 55 prepoznato prenatalno, dok je 416 otkriveno postnatalno tokom hospitalizacije. Čak u 198 dece dijagnoza životno-ugrožavajućeg stanja je postavljena tek nakon otpusta iz bolnice. Njih 168 je preživelo, a 30 je preminulo nakon što je nedijagnostifikovano otpušteno iz bolnice. Pomenimo još nekoliko koristi antenatalne dijagnoze:

More time is obtained which is available to future parents to understand the whole problem, but also more time to perform additional tests. After the initial diagnosis, parents have time to get advice from an obstetrician and a pediatric cardiologist in order to reach the initial decision. If the parents opt not to terminate the pregnancy, further tests are indicated such as full organ and system scan, as well as invasive diagnostic procedures, such as amniocentesis and cordocentesis. After additional testing, parents have another counseling with an obstetrician, a pediatric cardiologist and a genetic specialist too. After that the parents usually reach the final decision. However, if they still have not reached it, they may:

- ask for an opinion of another obstetrician, pediatric cardiologist or cardiac surgeon
- have support through visiting cardio centers
- talk to a children's cardiac surgeon who will familiarize them with the type of operation, possible complications, likelihood of success, postoperative period and long term life expectancy
- meet and talk to other parents of children with CHD and, through talking to them, get to know all the aspects of life of their children, from concerns, fears, troubles, but also to joys the life brings regardless of the burden of the disease these children have

Practical medical advantages of prenatally diagnosed CHD are reflected in the following:

- Serial fetal monitoring may modify the diagnosis and by that the parents' decision
- In certain conditions intrauterine medicine or surgical therapies are enabled
- Surgical urgent conditions are avoided
- Multidisciplinary approach, with participation of an obstetrician, a fetal cardiologist, a children's cardiac surgeon and a cardiologist specialized in treatment of adults with CHD provide for the choice of the best method of treatment. In case of deciding for operative treatment, it is possible for the surgeon to get to know the type and peculiarity of problems of his/her future patient while still in its mother's womb
- By means of prenatal diagnostics of CHD, transport of a pregnant woman to an appropriate institution may be organized and not just the child later

Više vremena za buduće roditelje da shvate ceo problem, ali i za izvođenje dodatnih testova. Nakon postavljanja inicijalne dijagnoze, roditelji imaju vremena da se savetuju sa obstetričarem i pedijatrom kardiologom da bi doneli inicijalnu odluku. Ukoliko se ne odluče za prekid trudnoće, indikovano je dalje testiranje, u vidu detaljnog ultrazvučnog pregleda svih organa i organskih sistema fetusa i invazivne dijagnostike, kao što su amniocenteza i kordocenteza. Nakon ovoga se roditelji ponovo savetuju sa obstetričarom, pedijatrom kardiologom, ali i sa genetičarom. Posle toga obično donose finalnu odluku. Međutim, ako je i dalje nisu doneli, oni mogu:

- potražiti mišljenje drugog obstetričara, dečjeg kardiologa i kardiohirurga
- posetiti dečije kardio-centre i razgovarati sa dečjim kardiologom i kardiohirurgom, koji će ih upoznati sa vrstom operacije, mogućim komplikacijama, verovatnoći uspeha, postoperativnom periodu i dugoročnim životnim prognozama
- da se sretnu sa roditeljima dece sa KSB i da kroz razgovor sa njima upoznaju sa svim budućim životnim aspektima njihove dece, od briga, strahova, nevolja, ali i životnih radosti koje nosi život bez obzira na breme bolesti koje ova deca imaju
- da razgovaraju sa psihologom

Praktične medicinske prednosti prenatalno dijagnostikovane KSB se ogledaju u sledećem:

- Serijski fetalni monitoring može modifikovati dijagnozu, a time i odluku roditelja
- U određenim stanjima omogućava intrauterinu medikamentoznu ili hirušku terapiju
- Izbegava se hiruško urgentno stanje
- Multidisciplinarni pristup obstetričara, fetalnog kardiologa, pedijatra kardiologa, dečjeg kardiohirurga i kardiologa specijalizovanog za lečenje odraslih osoba sa KSB, obezbeđuje izbor najboljeg načina lečenja. U slučaju operativnog lečenja, hirurg se upozna sa vrstom i osobenošću problematike svog budućeg pacijenta dok je on još u utrobi majke
- Prenatalna dijagnostika KSB omogućava blagovremeni transport trudnice, a ne zakasneli transport neonatusa u odgovarajuću ustanovu
- U nekim zemljama porođaj takvih trudnica se obavlja samo u najboljim medicinskim centrima

- In some countries delivery of those pregnant women is indicated only in the best medical centers

Experience has shown that the parents most often come to a decision regarding the fate of the pregnancy with a fetus with CHD on the basis of:

- Reliability of diagnosis
- Likely outcome of the surgical intervention
- Long term living perspective, in the sense of potential mental disability, quality of life, degree of possible physical activity, possibility of studying and education, future reproductive prognosis and capabilities.

Conclusions

The 4-chamber view has a Detection Rate of 6-50%, with a reasonable figure of 20% in community setting screening programs. The addition of the outflow determines a significant increase of the DR which, in most studies, ranges 20-40%. The three-vessel view allows to detect major abnormalities of the arches, the neck vessels and the thymus. The prenatal detection of specific CHD, such as TGA, HLH and Fallot, seems to have a significant impact on survival, hospital stay and pre-operative conditions of the affected neonates. Hence, fetal cardiac screening is a must for all health professionals involved in prenatal diagnosis.

Iskustvo je pokazalo da pacijenti najčešće donose odluku o sudbini trudnoće sa fetusom koji ima KSB na osnovu:

- Pouzdanosti dijagnoze
- Verovatnog ishoda hiruške intervencije
- Dugoročne životne perspektive, u smislu eventualnog mentalnog hendikepa, kvaliteta života, stepena moguće fizičke aktivnosti, mogućnosti učenja i obrazovanja, buduće reproduktivne prognoze i sposobnosti

Zaključak

Brojne studije su pokazale da pregled četvorokomornog preseka srca detektuje KSB u opsegu od 6-50%, a najveći broj studija govori o detekciji od oko 20%. Dodatni pregled srca na nivou izlaznog trakta obe komore dovodi do značajnog porasta stope detekcije KSB, a ona se u najvećem broju studija kreće od 20-40%. Pregled na nivou preseka tri krvna suda omogućа detekciju velikih anomalija duktalnog i aortnog luka, krvnih sudova vrata i timusa. Prenatalna detekcija nekih vrsta KSB, kao što su transpozicija velikih krvnih sudova, sindrom hipoplastičnog levog srca i Tetralogija Fallot, ima značajan uticaj na preživljavanje, dužinu hospitalizacije i preoperativno stanje afektirane dece. Zbog svega navedenog prenatalni skrining KSB je obaveza svih lekara uključenih u procese prenatalne dijagnostike.

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