

● Correspondence

COMMENTS FOR "RECOMMENDATIONS FOR FETAL ECHOCARDIOGRAPHY IN SINGLETON PREGNANCY IN 2015"
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Description:

Comment on recommendations of echo in singleton fetuses

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Dear Authors,

We have read the article titled "Recommendations for fetal echocardiography in singleton pregnancy in 2015" and we would like to share with you many of our concerns. This answer is written after several discussions among specialists who are active in the field of fetal cardiology, pediatric cardiology and cardiac surgery in Poland and who are well known national and international experts on their field.

In the abstract:

"AHA classification of heart defects in prenatal cardiology into seven major groups (from 2014) is presented as well as the Polish classification into four groups (from 2012) related to the urgency of required time to postnatal treatment/intervention based on FE findings in the 3rd trimester of pregnancy"

This is not Polish classification, but classification which is used by prof. Maria Respondek – Liberska and her team. Other fetal and pediatric cardiologists from the reference fetal and pediatric cardiology centers in Poland used classification very similar to AHA.

The authors wrote:

"Our aim is to better define the fetal echo guidelines for practitioners in tertiary centers, encompassing early diagnoses and emphasizing the importance of appropriate parental counseling for prenatal diagnosis. The guidelines are intended to address patients that have already been

diagnosed with suspected fetal CHD and the family has now been referred to a tertiary care/ higher level center that routinely manages these types of patients."

It is not clear, for whom those recommendations are addressed. There are just two Polish authors, none of them is pediatric cardiologists, and both represent only one fetal cardiology center in one town. So these recommendations are rather dedicated to this center, not to all others.

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 These guidelines will focus on the performance of a complete fetal echocardiogram, performed by a dedicated team of specialists (fetal and pediatric cardiologists, MFM specialists or radiologists).

The authors wrote that a complete fetal echocardiogram should be performed by a "dedicated team of specialists". According to AHA and European guide-lines, full fetal echocardiogram must be performed, or read and consulted by pediatric cardiologist, who is a specialist in fetal cardiology too.

The authors proposed to perform fetal echocardiography during the whole pregnancy period, excluding the first trimester. This is quite strange, as the fetal echocardiography is recommended in the first trimester scan in some situations. In my institution (and many others like FMF in London, Ruda Śląska in Poland) the first echocardiogram in specify cases is performed in the first trimester (11.0 – 13.6 weeks). According to the experience of my team (dr P. Własienko PhD thesis)

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possibility of fetal cardiovascular system evaluation is up to 90% in the first trimester.

Description of the method of performing the full fetal echocardiography is written in quite disorganized way.

There are some mistakes in the whole part describing how to perform advanced fetal echo and what to look for. We underline them below.

1. *"The DV pulsatility should be biphasic and always showing positive flow toward the heart throughout the cardiac cycle in order to assure normal central venous pressure."*

To be precise: ductus venosus flow showed three phases: S in ventricular systole, D in ventricular diastole and a in atrial contraction. So it is "tri-phasic" not "bi-phasic", like in all other veins (excluding umbilical vein).

2. *"The heart should then be imaged to show its location within the central left thorax above the stomach. This insures normal situs."*

This description indicated the position of the heart within the thorax: normal – apex to the left, dextroposition or dextrocardia, levoposition. It is not "situs. Situs described atrias and visceras.

3. *"Situs also involves looking at relative position of descending aorta and IVC in abdomen and position of abdominal organs such as stomach. Any variation from normal situs is a flag for CHD or a mass effect on the fetal heart. The relative positions and function of all systemic and pulmonary veins, relative chamber sizes and morphologies, all valves, and both the aortic and ductal arches should be imaged both statically as a saved freeze frame and dynamically in a video clip."*

In pediatric and fetal cardiology world – wide accepted description of the cardiovascular system is called: segmental analysis. It has already been used for years in many fetal and pediatric cardiology centers. So it should not be written, that "situs also involves" ... It is a rule to evaluate situs viscerus to define if this is situs solitus or heterotaxy syndrome (or left or right isomerism), atrial situs and position of the heart. And then: veno – atrial, atrio – ventricular and ventriculo – atrial connections.

4. Somewhere in the middle the authors wrote, what fetal echocardiography represents – it should be written just in the beginning, and then step by step evaluation: what to look for and how to look at it.

5. In the other place they wrote that *"In cases of potential heart failure, additional detailed Doppler evaluation (such as cardiovascular profile score, tissue Doppler) or 3D/4D fetal cardiac imaging may be indicated"*.

Evaluation of the fetal heart failure is much more complicated. CVPS is not only Doppler evaluation. 3D/4D is indicated rather in cases of complicated heart defects

to obtain no standard views. Its usefulness for fetuses with fetal heart failure is rather little.

6. There is a sentence, which is not clear for a reader: *"Close serial monitoring of (probably something missing?) should be performed for certain cases, optimally starting at 4 week intervals, through 3, 2 and 1 week intervals up to the time of delivery in order to identify those fetuses at risk for restriction at the foramen ovale and/or constriction of the ductus"*.

What fetuses should be monitored like this? All? Specific lesions?

7. Description how to diagnose fetal arrhythmia is far from perfect. Umbilical flow is one of the worst for that purpose.

The whole part which described management of fetuses with the most severe heart defects, how to deliver them, what are the methods of treatment showed that authors are not aware of nowadays Polish possibilities. They share with a reader just the experience from their own center, what cannot be accepted by other referral centers. Since 2011 there is a very active fetal cardiac intervention program in Poland. All possible fetal cardiac interventions: fetal aortic and pulmonary valvuloplasty, atrioseptostomy and interatrial stent placement are available in Warsaw. 68 interventions were performed since June 2011 until October 2015. So this is an option for those fetuses that deteriorated in utero with some of the most severe and potentially lethal disorders. In such recommendation indication for fetal cardiac intervention should be indicated very clearly.

The dedicated delivery room – basing on Warsaw experience is not necessary. The team of experienced neonatologists should be present during delivery of neonates with critical lesions who are expected to require very quick intervention. In my unit such organization is very successful and we did not lose any patient due to delayed transport to the cardiac center.

Table 2 – the authors pointed the first trimester, whereas they did not recommend first trimester echocardiography – the first echo which is proposed in this article is between 13 and 17 weeks, which is already the second trimester.

In the Table 3 the authors recommend CC for the *"severe urgent" with ductal and foramen ovale dependent circulation for instance critical AS*.

We do not agree with this classification and with such approach. Our policy is different and we presented it during many Polish and international meetings. Certainly fetuses with severe aortic stenosis are not candidates to be delivered by elective cesarean section, what we published in *Ginekologia Polska*, 2015;86:280-286.

The part of classification is divided for those quoted from AHA, and commented, that it is too complicated,

and then “Polish” classification which –as I have already mentioned several times – is not “Polish” but developed and used ONLY by Prenatal Cardiology Department Polish Mother’s Research Hospital. The authors can use this classification for their purpose and they can advertise this as the simpler than AHA, but other Polish fetal and pediatric cardiology centers do not agree with it and they do not use it. So it cannot be recommended as the majority of specialists working in this filed in Poland do not follow this rules. We do not agree with this classification due different experience in our center:

a) Severest heart defects: SA with giant LA – there are data indicated that prenatal intervention can be of benefit for the fetus and the mother, however we agree that it is one of the most severe defect.

b) Severe urgent heart defect

- if TGA is really “urgent” the baby needs Rashkind procedure within few hours, not 48 hours. In our team neonates with TGA and restrictive foramen ovale are the most “urgent” patient if it is known basing on prenatal scan;
- HLHS with restrictive Fo: during last 4 years are diagnosed earlier in pregnancy and atrioseptostomy or stent placement is performed prenatally, to obtain the best possible condition of the neonate;
- Neonates with critical aortic stenosis usually need intervention earlier and sometimes their condition deteriorate quickly, however neonates with pulmonary stenosis can wait even few days for planned pulmonary valvuloplasty as they tolerate prostin infusion very well and majority of them are in good general condition.

In conclusion – this classification does not fit the complexity of many forms of very complicated heart defects and we certainly prefer the AHA one, however for every day purpose we use individual classification and very detailed description of possible neonatal condition which not always can be predicted on the basis of fetal echocardiography.

Further discussion concerning “critical” heart defects is rather academic one. Fetal cardiology developed as a subspecialty of pediatric cardiology so we should have the common language. Following such thinking we still recommend to name the ductal dependent lesions “critical” as all those neonates will die without prostin. This is much more simple and understandable for all those people who are not familiar with all spectrum of congenital heart defect. The aim for fetal cardiology is to diagnose CRITICAL HEART DEFECTS which are SILENT clinically. So we do not see any logical reason to change this nomenclature.

And the last part: *“Who is a fetal cardiologist in 2015: A physician with background in pediatric cardiology, neonatology, obstetrics (usually maternal-fetal medicine), and*

who has worked for about five years in a referral center for prenatal cardiology and independently performed and interpreted normal and abnormal fetal echocardiograms. In Poland, such physicians are certified by the Section of Fetal Echocardiography and Prenatal Cardiology Polish Ultrasound Society. In general, as described in the latest AHA statement on fetal cardiology, “only well-trained or experienced pediatric cardiologists, maternal-fetal medicine specialists, obstetricians, or radiologists who have acquired the appropriate knowledge base and skills should supervise and perform fetal echocardiograms.”

Beside perform fetal echo prenatal cardiologist can also predict neonatal management and qualify CHD to appropriate group of one of the new CHD classification.

We do not agree with this statement. Fetal cardiology is a SUBSPECIALTY of pediatric cardiology, with links to genetics and feto-maternal medicine. It is not possible to become real fetal cardiologist without full training in pediatric cardiology. The specialist described above is “fetal echocardiographer” and such persons are certified by Section of Fetal Echocardiography and Prenatal Cardiology Polish Ultrasound Society. Such physicians, who got the “screening certificates for fetal echocardiography” can perform fetal echo, however they are not prepared for full prenatal cardiac counseling.

In the RECOMMENDATIONS FOR TRAINING IN PAEDIATRIC CARDIOLOGY prepared by AEPC is written: *“There are some areas of paediatric cardiology, which will require additional training in sub-specialties after the basic training. The areas of sub-specialisation include fetal cardiology, different modalities in imaging, catheter interventions, invasive cardiac electrophysiology, congenital heart disease in the adult (GUCH). (...)[https://aepc-org-bin.directo.fi/@Bin/8a705973345b05ae775f9a419e862052/1446670274/application/pdf/26772/AEPC_Training_Recommendations_May_2005.pdf]*

So we strongly advised, that fetal cardiologist should be CARDIOLOGIST at first, and then, after specialized training, become a fetal cardiologist. To become fetal cardiologist is much more complicated that knowledge about functional changes in obstetrics, which must be included in the training for fetal cardiologist. Certifications, which are issued by the Working Group for Prenatal Cardiology and Echocardiography of the Polish Ultrasound Society are not for FETAL CARDIOLOGISTS, but fetal echocardiographers, who can distinguish between normal and abnormal cardiovascular system, and in majority of cases (however not always) made the fetal cardiac diagnosis. This is called “Screening Certificate” of fetal echocardiography. There is the second level certificate which is called “Advanced Certificate for Fetal Cardiology”. Until recently, all doctors who had the advanced certificates are pediatric cardiologists or pediatricians who have been working at the pediatric cardiology departments. The authors of this comment strongly believe, that the Advanced Certificate for Fetal Cardiology should be reserved for trained pediatric cardiologists. Well trained

sonographer can perform the fetal echocardiogram. But consulting and decisions of pre- and perinatal treatment of complicated cases with various cardiac problems is the job for well-trained pediatric-fetal cardiologist. In my unit every week we had patients in whom the decisions were wrong or delayed due to the fact, that the counselling person was not trained pediatric cardiologist with profound knowledge of fetal cardiology, but holders of the screening certificates.

Recommendations are always necessary. However, they must be dedicated for somebody, and should include all possibilities available in the country for which they are dedicated for. In the published recommendation there is a big gap of such data.

Fetal echocardiography can be performed by doctors with different specialties, but **consultant in fetal cardiology** must be **pediatric cardiologist** who had profound knowledge on the field of fetal and pediatric cardiology. Counselling concerning cardiac treatment must always be provided by pediatric cardiologist who knows the recent policy of treatment for different defects and other cardiovascular problems, including those specific for fetuses.

Fetal cardiology is a team work and many people are involved during the perinatal care for the family who is expecting the child with complicated cardiac problem. The whole problem, how to organize the complete care for the pregnant women was not indicated in this article.

Fetal Cardiology in Poland is quite well developed field. Prof. Joanna Dangel is an active member of the Fetal Cardiology working Group of AEPC. She was the councilor, and then the treasurer of this group for 7 years. She is co-author of the Recommendations for the practice of fetal cardiology in Europe printed in 2004 [*Cardiol Young*, 2004;14:109-114]. Nowadays she is an active member of the group who prepared IFCIR – International Fetal Cardiac Interventions Registry and is the head of the active Polish fetal interventions group. So this is a great pity that those recommendations were not consulted in any fetal and pediatric cardiac centers in Poland. Like that they are just recommendations for the Fetal Cardiology Center in Łódź and they are not accepted by other centers in our country.

We decided to send our comments to all authors of this article, as we can not accept and follow this recommendations in Poland.