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Editorial

You may stay forever young: An editorial regarding management of heart disease in pregnancy

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Cardiovascular diseases (CVD) complicate a small fraction of pregnancies. However, heart diseases are a major cause of mortality among pregnant women, thus the knowledge of the risks associated with such conditions and their correct management are of pivotal importance. Moreover, some cardiovascular and pregnancy risk factors (as for example twin pregnancy) have a multiplicative effect on neonatal risk [1].

In this issue of the Journal, Cauldwell et al. [2] outlined the current evidences about cardiac diseases that potentially require cardiac surgery or percutaneous intervention during pregnancy. Authors focused on coronary artery disease (CAD), aortic dissection, mechanical valve thrombosis and mitral valve (MV) or aortic valve (AV) stenosis. Authors conclude that nowadays cardiac surgery is rarely necessary during pregnancy, but whenever required it should be performed with the adequate support of a multidisciplinary team.

Their take-home message is probably that the most important steps in the management of such conditions regard the prevention of complicated cases through an adequate and timely pre-pregnancy counselling of women with known cardiac disease. According to the recent ESC guidelines for the management of CVD during pregnancy [3], the Modified World Health organization classification of maternal cardiovascular risk represents the most accurate system for risk stratification in this subset of patients. In patients considered at "extremely high risk", an expert counselling is recommended and pregnancy should be discouraged. However, the necessity for a cardiac intervention could still arise in women with cardiac conditions with a low estimated risk that aggravate because of physiological changes related to pregnancy or in case of prior unknown CVD.

Authors state that second trimester could be the best time to proceed to intervention, as it "is a period when fetal organogenesis is largely complete, but the hemodynamic burden of pregnancy is not at his greatest". However, evidence suggest that maternal-fetal circulation is complete after 14th week but utero-placental hemodynamic flow remains stable until 20th week, after which it increases because of metabolic needs of the growing fetus [4]. Current ESC guidelines recommend intervention between the 13th and the 28th week [3]. Given the previously cited evidence, it could be speculated that best timing of intervention would be between 16th and 20th weeks.

Patients with AV and MV stenosis are particularly affected from the cardiovascular adaptive changes during pregnancy. This results in a 30–50% rate of Heart Failure (HF) and 0–3% of mortality in patients of MV stenosis [5], and a not negligible risk of HF, atrial and ventricular arrhythmias in patients with AV stenosis [6]. For pregnant women with MV area < 1.5 cm^2 or symptomatic AV stenosis, current recommendations suggest to perform percutaneous treatment (mostly percutaneous balloon valvuloplasty) if symptomatic or in the presence of pulmonary arterial hypertension despite optimal conservative management [3]. The suggestion to avoid cardiac surgery throughout pregnancy is mainly due to the significant fetal risk during cardiopulmonary bypass, related to the reduced utero-placental flow, whereas the maternal risk does not appear higher than in non-pregnant women [7]. It should be noted that percutaneous valvuloplasty is associated with a non-negligible risk of moderate to severe valve regurgitation: 12.4% of significant mitral regurgitation in 380 patients undergone percutaneous mitral valvuloplasty [8]; 17% rate of moderate to severe aortic regurgitation after percutaneous aortic valvuloplasty [9]. Acute valve regurgitation could require emergent surgery, that would inevitably be associated with a poorer outcome as discussed by Cauldwell. Also, in patients treated with percutaneous procedure, restenosis may develop in an unpredictable longer-term, with the necessity of repeated procedures or surgery. These issues further highlight the importance of pre-pregnancy counselling, in order to address pregnant women to referral

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centers and to plan cardiac intervention in a non-emergent setting. Authors also speculate about the potential role of transcatheter aortic valve replacement (TAVR) in the pregnancy context. While its good safety-effectiveness profile could make it a valid solution for pregnant women with aortic stenosis, we should not forget that these patients represent a category with special necessities: young women referred for TAVR should then accept the idea of at least one additional valve surgery during their lifetime. On the other hand, should a valve replacement be required, the trade-off would involve the risk of anticoagulant therapy (including warfarin embryopathy) versus the limited durability of bioprosthetic valves (as for TAVR). Once again, we believe that an adequate counselling should aim to address women with moderate valve disease to do not delay pregnancy.

Another critical question, not extensively debated by Cauldwell et al., regards the risk of radiation exposure to the fetus during percutaneous interventions. Risks are highest during organogenesis, however the mean radiation exposure to the abdomen is 1.5 mGy and <20% of this reaches the fetus, whereas radiation-induced abnormalities (including growth restriction and malignancies) are usually observed for exposure of 100–200 mGy [10]. Whenever possible procedures should be delayed, but this could be dangerous in life-threatening situations as acute coronary syndromes (ACS). ACS management in pregnancy is similar to that in the general population, including indication for revascularization. In particular, even if the effects of ionizing radiation should be adequately discussed with the mother, they should not prevent primary PCI when indicated [3]. Moreover, the safety of P2Y12 inhibitor drugs in pregnancy have not been adequately tested and that breastfeeding is not recommended in mothers treated with these agents.

In conclusion, we support the efforts of the authors to resume available data in a field where evidence from RCTs are missing. The world of cardiac disease complicating pregnancies is unfortunately far more wide than the one described by Cauldwell et al., spreading from cardiomyopathies to pulmonary arterial hypertension. We yet believe that in the best possible future scenario a major role should be played from prevention of clinical condition requiring cardiac surgery or percutaneous intervention during pregnancy. An adequate information of women with cardiac disease contemplating pregnancy, also taking into account the emotional and cultural context, should clearly illustrate that in most cases a good plan can be minimize the risks in order to be “forever young” as in the famous song of Bob Dylan.

Conflict of interest

None.

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