Maternal HIV: Zidovudine treatment associates fetal cardiac hypertrophy


BCNatal - Barcelona Center for Maternal-Fetal and Neonatal Medicine (Hospital Clinic and Hospital Sant Joan de Deu), Barcelona, Spain

Objective

Our aim was to perform a comprehensive fetal echocardiographic study in Human Immunodeficiency Virus (HIV) pregnant women on combined antiretroviral treatment (cART) to assess whether cardiovascular changes previously described in the offspring are present already in prenatal life and to study its association with maternal and perinatal factors.

Methods

We conducted a prospective cohort study, including 42 non-infected fetuses from HIV pregnant women on cART and 84 fetuses from non-HIV-infected women. Fetal echocardiography was performed at 26-32 weeks of pregnancy to evaluate cardiac structure and function. The impact of maternal and perinatal factors on fetal cardiac remodelling was assessed by multivariate regression analysis.

Results

Fetuses from HIV pregnant women on cART presented larger hearts [cardio-thoracic ratio mean 0.29 (SD 0.04) Vs. 0.27 (SD 0.04); p= 0.049] and mild pericardial effusion together with thicker myocardial walls [mean septal wall thickness 3.56 mm (SD 0.88) vs. 2.75 mm (SD 0.77); p=0.002] and smaller left ventricular cavities (mean left ventricular transverse diameter and mean left atrial area (p=0.033 and 0.015 respectively) when compared to the non-HIV group. Fetuses from HIV pregnant women also present signs of both systolic (mitral systolic annular peak velocity: HIV 5.85 cm/s (SD 0.77) vs. non-HIV 6.25 cm/s (SD 0.97); p=0.007) and diastolic (isovolumetric relaxation time: HIV 52 ms (SD 8.91) vs. non-HIV 45 ms (SD 7.98); p<0.001) dysfunction. In the multivariate analysis, Zidovudine-containing cART maternal regimens were significantly associated with fetal cardiac changes (p=0.014), with no other maternal or perinatal factors significantly associated.

Conclusion

Non-infected children born to HIV-infected mothers on cART present signs of cardiac concentric hypertrophy already in fetal life. The significant association of fetal cardiac remodelling with maternal treatment with zidovudine challenges its use during pregnancy.