# Preconception physical activity alters the cardiovascular profile of women at risk for gestational hypertensive disorders in a profile-specific way

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**Objective.** To evaluate the effect of physical activity on the cardiovascular functions of pre-conceptional women at risk for gestational hypertensive disorders (GHD) in a subsequent pregnancy.
**Materials and Methods.** A non-invasive haemodynamics assessment of arteries, veins and heart was performed on 40 non-pregnant women with a history of complicated pregnancy or trying to conceive with co-morbidities. Measurements of electrocardiogram Doppler ultrasound, impedance cardiography and bio-impedance spectrum analysis were taken before and after they engaged in physical activity (30-50 min, 3x/week) for a period of 4-6 months. Pre- and post-activity parameters were compared using the two-sided paired Student's t-test or the Wilcoxon signed-rank test depending on the normality of the data.
**Results.** After physical activity, the total peripheral resistance (TPR), diastolic blood pressure and mean arterial pressure decreased in the total study population, without changing cardiac output (CO). However, in 42% (9/21) of women categorized in high or low baseline CO (> P75 or < P25 resp.) a shift in CO was observed towards the normal reference interquartile range (P25-P50). This was associated with improved hepatic venous and central arterial haemodynamic functions. Similar changes in TPR occurred in 38% (11/29) of women classified into low or high baseline TPR.
**Conclusions.** As shown in pregnancy, output- or resistance-dominant cardiovascular profiles already exist prior to conception. This study illustrates that physical activity in the pre-conceptional period shifts high or low CO and/or TPR towards the normal midrange, allowing women at risk for GHD to start a subsequent pregnancy with a more gestation-adaptable cardiovascular system.