

Effect of Low-Dose Acetylsalicylic Acid on Arterial Stiffness in High-Risk Pregnancies: An Observational Longitudinal Study

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Objectives: Low-dose acetylsalicylic acid (ASA) has been shown to reduce the risk for pre-eclampsia in high-risk pregnancies when prescribed before 16 weeks of gestation. It remains unknown whether this anti-inflammatory agent has effects on arterial stiffness. Our objective was to characterize arterial stiffness indices throughout pregnancy in women with high-risk pregnancies who were and were not prescribed low-dose ASA.

Methods: In this prospective longitudinal study, women with high-risk singleton pregnancies were recruited from obstetrical clinics in Montreal, Canada. Arterial stiffness was measured using applanation tonometry (SphygmoCor; AtCor) in the 1st trimester, every 4 weeks thereafter until delivery, and at 6 weeks' post-partum. Arterial stiffness was compared between women who were prescribed low-dose ASA (81 mg) before 16 weeks' gestation and women who were not prescribed any prophylactic medication for pre-eclampsia.

Results: Of the 152 participants who delivered in this ongoing study, 26 women were prescribed ASA. Longitudinal analyses adjusted for family history of pre-eclampsia, past history of pre-eclampsia, and development of an outcome showed no significant differences in carotid-femoral pulse wave velocity (cfPWV), carotid-radial PWV, augmentation index adjusted for a heart rate of 75 beats per minute, or start time of wave reflection (T1R) throughout pregnancy in women who were taking low-dose ASA (all $p > 0.05$). Additionally, 13 women developed pre-eclampsia and ASA did not confer any significant change in adjusted odds for the complication (OR: 4.85 95% CI: 0.5 – 41; $p = 0.15$).

Conclusion: In this high-risk pregnant population, ASA before 16 weeks' gestation was not associated with differences in arterial stiffness or wave reflection throughout pregnancy and did not have an effect on the odds for developing pre-eclampsia. Our ongoing study will provide definite evidence on the association between ASA use and arterial stiffness.