The maternal cardiovascular profile in women with previous bariatric surgery

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Objective
Obesity in pregnancy is associated with significant risks, notably hypertensive disorders. Bariatric surgery is a successful treatment for sustainable weight loss and has several positive cardiovascular implications, not only through weight loss, but also via the cardio-enteric axis. Normal pregnancy requires significant cardiovascular changes and maladaptation has been associated with complications such as pre-eclampsia. Pregnancy after bariatric surgery associated with a reduced risk of hypertensive disorders. The aim of this study was to investigate the maternal cardiovascular adaptation to pregnancy in women with previous bariatric surgery.

Methods
This was a prospective, observational, longitudinal study. Pregnant women with previous bariatric surgery were compared pregnant women without surgery but matched for similar early pregnancy BMI, age, race and gestational diabetes (n=41). In a second study women with previous bariatric surgery were compared to pregnant women without surgery but matched for similar pre-surgery BMI (n=33). Blood pressure and maternal transthoracic echocardiography were used for cardiovascular assessment.

Results
Post-bariatric pregnant women had lower systolic and diastolic blood pressure, heart rate and cardiac output compared to the no-surgery group (p<0.01 for all comparisons). There was no significant difference in ejection fraction between groups, however, there was lower global longitudinal strain in the post-bariatric group, suggesting better systolic function (p<0.01). Similarly, there was evidence of more favourable diastolic indices in the post-bariatric group with a higher E-wave/ A-wave flow velocity across the mitral valve (p<0.001), higher mitral annular velocity with tissue Doppler imaging at the lateral (p<0.01)/ medial (p<0.05) annulus and lower left atrial volume (p<0.05). In addition, post-bariatric pregnant women compared to pregnant women with similar pre-surgery BMI, had differing cardiac geometry with lower left ventricle mass and relative wall thickness.

Conclusion
Our findings indicate a better cardiovascular adaptation to pregnancy in women with previous bariatric surgery compared to pregnant women with a similar early pregnancy BMI and pregnant women with similar pre-surgery BMI. This may explain why women after bariatric surgery are less susceptible to hypertensive disease in pregnancy and could inform national guidance regarding beneficial effects of bariatric surgery in obese women of reproductive age.