

maternal cardiovascular diseases (CVD, myocardial infarction (MI), stroke, ischaemic stroke, intracerebral haemorrhage and subarachnoid haemorrhage) in women in the UK Biobank from 2006–2016.

Cardiovascular diseases (CVDs) are a high priority public health issue, presenting a high disease burden. Pregnancy has been described as a stress test for women's bodies, where complications with pregnancy, including pregnancy loss, may be an indicator of increased risk of future CVDs. However, findings regarding associations between pregnancy loss and future CVDs are mixed, with a scarcity of UK studies. Furthering understanding of female specific risk factors has the potential to increase the clinical utility of risk prediction and public health prevention.

**Methods** A prospective cohort study was conducted, including women in the UK Biobank cohort with self-reported exposure status recorded at baseline (n=246,124), with a median follow up time of 7.03 years (IQR 6.36–7.75) and a total of 1,762,729 person-years. Cardiovascular outcomes were ascertained through linkage of participant healthcare records and UK mortality databases. Cox proportional hazards models were used to ascertain Hazard ratios (HR) and 95% confidence intervals (CI). Patient and participant involvement (PPI) was included to inform understanding of public health impacts of study findings.

**Results** Within the study cohort, 79,482 (32.29%) women had experienced one or more pregnancy losses. During follow up 2,567 (1.04%) women developed CVD. A history of one or more stillbirths was associated with an increased risk of stroke (Adjusted HR 1.55, 95%CI 1.06–2.27), in particular subarachnoid haemorrhage (Adjusted HR: 1.52, 95%CI 0.62–3.74). Miscarriage was not consistently associated with an increased risk of any cardiovascular outcome and no association between a history of therapeutic abortion and increased risk of CVD was demonstrated.

**Conclusion** Analyses of the relationship between pregnancy loss and subtypes of CVD indicated that the direction and magnitude of associations were not universal in women in the UK Biobank or across populations. There is evidence of association between some types of pregnancy loss are associated with an increased risk of CVDs, though further research into associations with haemorrhagic stroke, and the associations between abortion and CVD, are needed. History of miscarriage and/or stillbirth should be considered for inclusion in cardiovascular risk assessment tools, potential pooled with other pregnancy complications, to identify and target support for women at increased risk.

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#### COMPARING THE RISK OF PREMATURE BIRTH FOLLOWING ABORTION WITH THE RISK AFTER MISCARRIAGE – A SYSTEMATIC REVIEW AND META-ANALYSES

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**Background** Premature births have increased in the UK in the last decade. The incidence of PTB in Scotland is now at an all-time high. The cause remains a mystery. We aim to

quantify the risk of moderate PTB (mPTB<37 weeks), very PTB (vPTB<32 weeks) and extremely PTB (xPTB<28 weeks) allowing for other risk factors, following single and multiple abortions, and single and multiple miscarriages using a series of systematic meta-analysis of papers published 1990–2019.

**Methods** Systematic review\* using PubMed, Cochrane, and Embase of papers published 1990–2019 and meta-analyses of observational studies were conducted separately for ToP and miscarriage. 67 separate studies were identified from 22 eligible papers for ToP; Further investigation allowed analysis relating to numbers of ToP, numbers of miscarriages and the degree of prematurity according to gestational birth age. Bias and Heterogeneity are measured and considered.

**Results** Miscarriage: AdjOR between 1.70, 95% CI (1.51–1.92) from Denmark and 1.12 (1.08–1.16) from Scotland for PTB after one miscarriage were noted from papers. These risks increased after two miscarriages with adjOR of between 2.20 (0.70–2.0) from Seattle and 1.36 (1.25–1.47) from Scottish data; AdjOR for xPTB after two or more miscarriages were between 4.0 (2.3–7.1) from Sweden and 2.81 (1.47–5.38) from Scotland. Iran reported Adj OR for xPTB of 4.10 (2.08–8.08) after three+ miscarriages.

**Abortion and Meta-analysis:** Fifty of the 67 studies demonstrated a significant increased risk of PTB related to abortion. Data was obtained from 22 countries worldwide. Risk of PTB after one+ abortion carried an Adj OR of 1.52 95% CI (1.43–1.62) compared to matched women who had no ToP (67 studies); Risk for corresponding miscarriage was 1.31 (1.18–1.45). Risk of vPTB after either ToP or miscarriage increased with increasing numbers of both ToP and miscarriage. The greatest risk increase noted was for xPTB after three+ ToP with Adj OR of 5.22 (1.58–17.21), whilst for three+ miscarriages it was 3.87 (2.85–5.26).

Risk of PTB was also measured according to method of abortion, or miscarriage treatment, and Adj OR compared for medical versus surgical treatments.

**Conclusion** The likelihood of xPTB increased after multiple Top (3 or more) and increased for miscarriages but to a lesser degree. The risk of any PTB also increases with multiple ToP and with several miscarriages. This is an important public health finding for women's choices for consent to ToP or to treatment after miscarriage in the UK. It has implications for costs, future research and reduction of premature births in the UK.

- \* Included studies 6005 titles and abstracts were identified 1990–2019 and papers were screened for eligibility. 43 papers were selected for systematic review, from which 23 papers (with 3,796,010 participants) met the inclusion criteria for the meta-analysis for ToP.
- Papers which did not distinguish miscarriage from abortion, and studies with overlapping data were excluded.
- The search strategy used MESH terms for Abortion or ToP (('Abortion, Induced' or 'Abortion, Legal' or 'Abortion, Therapeutic', 'Termination of pregnancy' ) AND ('infant, premature' or 'obstetric labor, premature' or 'premature birth' or 'preterm birth' 'fetal membranes, premature rupture' or 'Pregnancy complications, or 'pregnancy outcome'.
- For Miscarriage: ('miscarriage'; 'spontaneous abortion'; 'pregnancy loss')