A SYSTEMATIC REVIEW AND META-ANALYSIS OF RISK FACTORS FOR PREGNANCY-ASSOCIATED STROKE

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Abstract

Background Stroke in younger women is rare, however, pregnant women have a significantly increased risk around delivery and in early postpartum. Despite known risk factors, such as high blood pressure, the contribution of female-specific factors to women’s stroke risk are poorly understood. Whilst there are pathophysiological reasons for increased stroke in pregnancy, it is of clinical and public health importance to determine the extent to which these strokes can be pre-identified by background risk and pregnancy-related factors. We conducted a systematic review to identify risk factors for pregnancy-associated stroke, this included risk factors pre-existing (to pregnancy) and those developing during pregnancy and labour.

Methods An electronic search of PubMed, MEDLINE and EMBASE databases, without language, study design or publication date restrictions, was performed in November 2018. Study inclusion criteria were reported risk factors/characteristics for women with stroke during pregnancy or up to 12 months after delivery and for a comparison group of pregnant/postpartum women without stroke. Stroke timing (antenatal, perinatal, postnatal), diagnostic type and fatality were assessed. Data were extracted and, where possible, a random effects meta-analysis was conducted, heterogeneity quantified using I². Methodological quality was assessed using an adapted Newcastle-Ottawa scale.

Results Of 3784 papers screened, 9 studies met the inclusion criteria comprising 11,398 women with stroke and >85 million comparison women across 4 countries. Eight studies reported effect measures for at least one risk factor. Of fourteen risk factors reported, 8 showed a statistically significant increase in pregnancy-associated stroke; pooled odds ratios with 95% confidence intervals: maternal age 33.35 years 2.66 (1.83–3.87), black ethnicity 1.56 (1.35–1.81), smoking 1.96 (1.64–2.34), alcohol use 2.32 (1.41–3.81), drug abuse 1.82 (1.19–2.77), hypertension 4.80 (3.67–7.06), pre-eclampsia 10.30 (8.26–12.84) and cesarean delivery 4.85 (2.22–10.59). Parity, body mass index, obesity, diabetes, infection, and migraine were not associated. Studies provided limited data to assess risk factors according to stroke timing, type and fatality.

Conclusion Our findings improve current understanding of the relative contributions of different risk factors for pregnancy-associated stroke. However, our work highlights the very few existing studies in this area. The available studies assessed a limited number of risk factors, and many were similar to those known to increase stroke regardless of pregnancy. Studies including detailed risk assessment in relation to pregnancy, delivery and postpartum complications as well as women’s background risks are needed. Additionally, future research should establish whether risk factors differ according to stroke type and time-period in relation to pregnancy.