beyond those traditionally provided in primary healthcare. Providing access to community-based services is expected to, for example, help reduce social isolation, provide access to initiatives supporting behaviour change (such as walking groups) and mitigate some of the effects of poverty by access to welfare advice or employment opportunities. Although widespread, the evidence-base for the effectiveness of social prescribing is extremely limited. We aimed to assess the effect of a form of social prescribing, the primary care-based community links practitioner (CLP) programme, on patients' quality of life and wellbeing.

Methods Quasi-experimental cluster randomised controlled trial in socioeconomically deprived areas of Glasgow, Scotland. Adult patients (≥18 years) referred to CLPs in seven intervention practices were compared with a random sample of adult patients from eight comparison practices at baseline and 9 months. Primary outcome; health-related quality of life (EQ-5D-5L). Secondary outcomes; wellbeing (ICE-CAP A), depression (HADS-D) anxiety (HADS-A), and self-reported exercise. Multilevel, multi-regression analyses adjusted for baseline differences. Patients were not blind to the intervention, but outcome analysis was masked.

Results Data were collected on 288 and 214 (72.4%) patients in the intervention practices at baseline and follow-up, and on 612 and 561 (92%) patients in the comparison practices. Intention to treat analysis found no differences between the two groups for any outcome. In sub-group analysis, patients who saw the CLP on three or more occasions (45% of those referred) had significant improvements in EQ-5D-5L, HADS-D, HADS-A and exercise levels. There was a high positive correlation between CLP consultation rates and patient uptake of suggested community resources

Conclusion We were unable to prove the effectiveness of referral to CLPs based in primary care in deprived areas on improving patient outcomes. Future efforts to boost uptake and engagement might improve overall outcomes, although the apparent improvements in those who regularly saw the CLPs may be due to reverse causality. Further research is required before wide-scale deployment of this approach.

Pregnancy/Maternal Health 1

OP73 THE IMPACT OF CHRONIC HYPERTENSION ON ADVERSE MATERNAL AND PERINATAL OUTCOMES: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background Chronic hypertension affects up to 5% of all pregnancies, and this is expected to rise due to increasing prevalence of maternal obesity. This study aimed to systematically review observational studies to investigate the risk of adverse perinatal outcomes among pregnant women with chronic hypertension compared with normotensive women.

Methods Medline/PubMed, EMBASE, and Web of Science were searched (from first publication until 10th January 2019) to identify peer-reviewed articles without restriction on language or study period. We included observational studies based on the following criteria: 1) participants were pregnant women; 2) exposure was chronic hypertension; 3) comparison was normotensive women; 4) outcomes included measures of at least one of the following: superimposed pre-eclampsia, small for gestational age, stillbirth, preterm birth, caesarean section, neonatal intensive care unit admission, low birth weight, post-partum hemorrhage maternal death and neonatal death. This review is registered in PROSPERO (CRD42019120088).

Two investigators independently reviewed the eligibility criteria, extracted the data and assessed the quality of included studies using the Newcastle-Ottawa tool. A meta-analysis was performed using RevMan 5.3 for each exposure-outcome association, when data allowed. Random effect models were applied for pooling crude and adjusted odds ratios (ORs) respectively. Heterogeneity among studies was assessed using a Cochrane Q statistic and the Higgins I^2 test. Sensitivity analysis was performed by study design, study location, decade of publication, and according to study quality. Publication bias was assessed using Begg's funnel plot and Egger's test. The effect of using antihypertensive medications on the risk of adverse maternal and perinatal outcomes will also be analysed as part of this review.

Results Of the 9739 articles identified, 69 studies met the inclusion criteria. Thirteen studies reported adjusted estimates for small for gestational age (including 7,070,558 participants); adjusted pooled OR=1.97 (95% CI, 1.46, 2.67) among women with chronic hypertension compared to normotensive. Similarly, eleven studies reported adjusted estimates for stillbirth (including 15,231,939 participants), with a pooled adjusted OR=2.36 (95%CI, 2.18, 2.55). Four studies reported adjusted estimates for neonatal death, the adjusted pooled OR=2.29 (95%CI, 2.03, 2.60). The analyses of other outcomes are ongoing.

Conclusion There are strong associations between chronic hypertension and adverse perinatal outcomes, including small for gestational age, stillbirth and neonatal death. Most studies in this review did not take severity of hypertension into account when comparing the outcomes. This review summarises current knowledge on the association between chronic hypertension and adverse perinatal outcomes and may be used to optimise antenatal care and pregnancy outcomes.

OP74 MATERNAL SMOKING DURING PREGNANCY AND RISK OF TYPE 1 DIABETES: WHOLE-OF-POPULATION STUDY

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Background Evidence about maternal smoking during pregnancy and type 1 diabetes (T1D) risk is inconsistent. Most studies have small numbers of children exposed to prenatal smoking, and some were unable to look at timing of exposure to smoking, or were at risk of bias due to unmeasured confounding. Therefore, the objectives of this study were: 1) to estimate the association between prenatal smoking and T1D risk, looking at the timing of exposure to smoking (throughout pregnancy, first-half, or second-half of pregnancy), with adjustment for a range of confounding factors defined a priori; 2) to perform a negative-control outcome analysis to

detect bias due to unmeasured confounding; and 3) to combine estimates from population-based and case-control studies in meta- analyses.

Methods This whole-of-population study of children born from 1999–2013 (n=286,058, aged <15 years) used de-identified linked administrative datasets from the South Australian Early Childhood Data Project. T1D was diagnosed for 557 children during hospitalization (ICD-10-AM codes, E10, E101-E109) from 2001–2014. Maternal smoking data was sourced from the South Australian Perinatal Statistics Collection, where information at birth is collected by midwives/neonatal nurses using a validated tool. Hospitalization for any injury occurring at school was used as a negative-control outcome. Adjusted Cox proportional hazard ratios (HR) were calculated in the main analysis and the negative-control outcome. Random-effects meta-analysis was used to summarize effects of prenatal smoking on childhood T1D.

Results Compared with non-smokers, smoking throughout pregnancy was associated with 23% lower childhood T1D risk (HR 0.77; 95% CI 0.60–1.00), with similar effects for smoking in first-half (HR 0.78; 95% CI 0.60–1.01) and second-half (HR 0.75; 95% CI 0.57–0.98) of pregnancy. The negative-control outcome analysis (HR 0.95; 95% CI 0.86–1.05) suggested the effect of prenatal smoking on T1D was not due to unmeasured confounding. These results were consistent with meta-analytic estimates of prenatal smoking and childhood T1D risk from population-based (HR 0.70; 95% CI 0.60–0.81) and case-control studies (OR 0.71; 95% CI 0.55–0.86).

Conclusion Maternal smoking in pregnancy was associated with lower risk of childhood T1D. The negative-control outcome analysis suggests this effect is unlikely to be due to unmeasured confounding. Our meta-analytic estimates also showed lower risk of T1D for children exposed to maternal smoking during pregnancy. Smoking causes irreversible harm to the fetus, however understanding the mechanism of protective effects (e.g. nicotine exposure, gene expression) might lead to new insights about T1D.

OP75 A SYSTEMATIC REVIEW AND META-ANALYSIS OF RISK FACTORS FOR PREGNANCY-ASSOCIATED STROKE

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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 I^2. 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 ^{3};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 (3.26–7.06), 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.

OP76 A SYSTEMATIC REVIEW AND META-ANALYSIS ON NEURODEVELOPMENTAL EFFECTS OF PRENATAL VITAMIN D IN HUMANS

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Background Vitamin D plays a key role in brain development and function; however, evidence in humans has never been systematically reviewed. Hence, we conducted a systematic review, accompanied by meta-analyses where possible, to summarize the existing evidence in humans on the relationship between prenatal 25-hydroxyvitamin D [25(OH)D] circulating levels and neurodevelopmental outcomes, including cognition, psychomotor performance, language development, behavior, ADHD, and autistic traits.

Methods PubMed, Web of Science and SCOPUS databases were systematically searched using keywords. Study eligibility criteria were: 1) original epidemiologic study performed in humans; 2) available information on circulating concentration of 25(OH)D in maternal or newborn blood as exposure; 3) outcome assessment included information on the offspring's neurodevelopment evaluated by standardized test scores; and 4) available data on the relevant estimates of effect size and the corresponding 95% confidence intervals (CIs). For all the