Hypertensive Disorders of Pregnancy and Adult Offspring Cardiometabolic Outcomes: A Systematic Review and Meta-analysis

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Background
- Hypertensive disorders of pregnancy affect up to 8% of pregnancies.1
- They include eclampsia, pre-eclampsia, gestational hypertension, pre-existing chronic hypertension, and preeclampsia superimposed on chronic hypertension.
- Previous systematic reviews have shown that the offspring of women with pre-eclampsia have increased BP and BMI in childhood and early adulthood,2,3
- Less is known about the later life consequences.

Aim
To systematically review the association between maternal hypertensive disorders of pregnancy and cardiovascualr risk factors and disease in adult offspring.

Methods
INCLUSION CRITERIA
- Types of study: Observational epidemiological studies
- Types of participant: Offspring aged at least 18 years at last follow up
- Types of exposure: In utero exposure to any maternal hypertensive disorder of pregnancy

SEARCH METHODS
- Medline, EMBASE and CINAHL, bibliographies of included studies
- No language restrictions
- Quality appraisal was done using the Newcastle Ottawa Scale
- Meta-analysis used a fixed effects approach

Results
- 8 cohort studies were included in the review (fig 1 & 2)
- Key quality issues included definition of hypertensive disorders of pregnancy, characterisation of comparison groups and completeness of follow-up

BLOOD PRESSURE
Blood pressure: (three studies): Meta-analysis of two studies showed statistically significant increases in both systolic and diastolic blood pressure (fig 3)4,5. A third study showed a statistically significant increase in risk of elevated blood pressure in adult offspring exposed to maternal hypertensive disorders of pregnancy.8

Figure 3 Blood pressure

Hypertension (two studies): Meta-analysis showed a statistically significant increased risk of hypertension (fig 4).4,9

Figure 4 Hypertension

BODY MASS
Blood pressure

Glucose metabolism

LIPIDS
Total cholesterol (two studies): No evidence of significant differences in adult offspring exposed to maternal hypertensive disorders of pregnancy.5,8

Discussion and conclusion
LIMITATIONS
- A limited number of studies was available.

IMPLICATIONS
- Adult offspring exposed to maternal hypertensive disorders of pregnancy appear to have adverse cardiovascular risk changes.
- This supports the hypothesis that adult offspring exposed to maternal hypertensive disorders in pregnancy have a risk of clinical cardiometabolic events later in life, including hypertension and stroke.

FUTURE AREAS OF RESEARCH
- What is the strength, specificity, timing and attributable risk of any associations so that high-risk individuals can be identified?
- Do such individuals benefit from earlier monitoring and intervention?

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References: