**Hypertensive Disorders of Pregnancy and Behavioural Outcomes in the**

**Offspring: Findings from the Millennium Cohort Study**

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**eMethods 1:** Description of confounders

*Maternal age:* measured in years and referred to mother’s age at time of birth of cohort member.

*Maternal education:* highest academic qualification was categorised as higher degree, first degree, diploma in higher education, A/AS/S levels, O level/GCSE grades A-C, GCSE grades D-G, other academic qualifications and none of these qualifications. Higher degree, first degree and diploma in higher education were recategorised as diploma or above. A/AS/S levels were recategorised as A level. O level/GCSE grades A-C and GCSE grades D-G were recategorised as O level. Other academic qualifications were recategorised as other/unknown and none of these qualifications were recategorised as less than O level.

*Maternal smoking status:* mothers were asked the number of cigarettes they smoked per day before pregnancy and the number smoked per day if they changed the amount smoked during pregnancy. This information was recategorised as non-smoker, quit during pregnancy and smoked during pregnancy.

*Maternal alcohol consumption during pregnancy:* mothers were asked about their frequency of alcohol consumption during pregnancy. This information was recategorised as a dichotomous variable (maternal alcohol consumption during pregnancy: yes/no).

*Pre-pregnancy body mass index (BMI):* maternal height and weight just before becoming pregnancy were self-reported; these were used to calculate maternal BMI and was recategorised as underweight, normal weight, overweight, obese and unknown.

*Household income:* categorised according to the Organisation for Economic Co-operation and Development (OECD) income weighted quintiles.

*Infant sex:* categorised as male/female.

*Parity:* derived from number of cohort member’s siblings in the household and recategorised as primiparous/multiparous.

*Ethnic origin:* categorised as white, mixed, Indian, Pakistani or Bangladeshi, Black or Black British and other ethnic group. These were recategorised as white and other ethnic origin.

*Preterm birth:* mothers were asked about their child’s gestation age in days. This was converted to weeks and recategorised as <37 weeks’ gestation and ≥37 weeks’ gestation.

*Small for gestational age (SGA):* defined as birthweight <10th percentile for gestational age and sex of child and based on maternal-reporting of child’s birthweight, gestational age and sex.

*Level of deprivation:* deprivation decile scores were calculated from home postcodes using the 2004 overall Indices of Multiple Deprivation (IMD). A binary variable was created to represent children living in areas of highest deprivation (deciles 1–5) and lowest deprivation (deciles 6–10).

*Maternal depression/mental illness during pregnancy:* mothers were asked: “Did you have any illnesses or other problems during your pregnancy that required medical attention or treatment?” If the answer to this question was yes, she was instructed to choose all that apply from a list of illnesses. The list included “Depression or mental illness”. If she ticked this box, then Depression or mental illness during pregnancy was assumed.

**eFigure 1:** Flowchart of study participants

Total population at baseline (MCS1): 18552 families (18827 children)

553 excluded because they were multiple births or had missing data on HDP

N=18274 singleton mother-child pairs with data on HDP

15590 families at MCS2.

Of which 13647-13991 answered questions on SDQ

15246 families at MCS3.

Of which 13878-14025 answered questions on SDQ

13857 families at MCS4.

Of which 12725-12834 answered questions on SDQ

13287 families at MCS4.

Of which 11083-12006 answered questions on SDQ

11726 families at MCS4.

Of which 10780-10799 answered questions on SDQ

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| **eTable 1: Association between Hypertensive Disorders of Pregnancy and total Strengths and Difficulties Questionnaire cut-off at ages 3, 5, 7, 11 and 14 years among Millennium Cohort Study Participants by Gestational Age** | | | | |
|  | **Exposed Cases:**  **SDQ cut-off** | **Model 1a**  **OR (95% CI)** | **Model 2b**  **OR (95% CI)** | **p-value for**  **interaction termb** |
| *Total SDQ (cut-off ≥17) Age 3c* |  |  |  |  |
| HDP (≥37 weeks’ gestation) | 91 | 1.09 (0.84, 1.42) | 1.18 (0.90, 1.55) | 0.221 |
| HDP (<37 weeks’ gestation) | 23 | 1.52 (0.86, 2.66) | 1.67 (0.89, 3.12) | 0.104 |
| *Total SDQ (cut-off ≥17) Age 5c* |  |  |  |  |
| HDP (≥37 weeks’ gestation) | 59 | 1.39 (1.01, 1.91) | 1.46 (1.05, 2.05) | 0.024 |
| HDP (<37 weeks’ gestation) | 12 | 1.37 (0.64, 2.92) | 1.32 (0.60, 2.89) | 0.485 |
| *Total SDQ (cut-off ≥17) Age 7c* |  |  |  |  |
| HDP (≥37 weeks’ gestation) | 53 | 0.95 (0.69, 1.32) | 0.94 (0.67, 1.31) | 0.703 |
| HDP (<37 weeks’ gestation) | 13 | 1.23 (0.61, 2.49) | 1.19 (0.56, 2.52) | 0.636 |
| *Total SDQ (cut-off ≥17) Age 11c* |  |  |  |  |
| HDP (≥37 weeks’ gestation) | 63 | 1.14 (0.83, 1.56) | 1.05 (0.76, 1.46) | 0.737 |
| HDP (<37 weeks’ gestation) | 16 | 1.53 (0.80, 2.92) | 1.43 (0.72, 2.83) | 0.298 |
| *Total SDQ (cut-off ≥17) Age 14c* |  |  |  |  |
| HDP (≥37 weeks’ gestation) | 58 | 0.91 (0.66, 1.26) | 0.88 (0.63, 1.23) | 0.462 |
| HDP (<37 weeks’ gestation) | 18 | 1.45 (0.79, 2.65) | 1.43 (0.75, 2.71) | 0.269 |
| aCrude analysis.  bAdjusted for maternal age, maternal education, maternal smoking status, maternal alcohol consumption during pregnancy, pre-pregnancy BMI, household income, infant sex, parity and ethnic origin.  Abbreviations: OR, odds ratio; 95% CI, 95% confidence interval; SDQ, Strengths and Difficulties Questionnaire; HDP, hypertensive disorders of pregnancy.  cReference: No HDP and born at ≥37 weeks’ gestation. | | | | |

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| **eTable 2: Association between Hypertensive Disorders of Pregnancy and total Strengths and Difficulties Questionnaire cut-off at ages 3, 5, 7, 11 and 14 years among Millennium Cohort Study Participants by non-SGA/SGA** | | | | |
|  | **Exposed Cases:**  **SDQ cut-off** | **Model 1a**  **OR (95% CI)** | **Model 2b**  **OR (95% CI)** | **p-value for**  **interaction termb** |
| *Total SDQ (cut-off ≥17) Age 3c* |  |  |  |  |
| HDP (not SGA) | 105 | 1.24 (0.96, 1.59) | 1.32 (1.01, 1.73) | 0.038 |
| HDP (+SGA) | 8 | 0.87 (0.39, 1.91) | 0.90 (0.41, 1.99) | 0.811 |
| *Total SDQ (cut-off ≥17) Age 5c* |  |  |  |  |
| HDP (not SGA) | 64 | 1.44 (1.05, 1.97) | 1.48 (1.07, 2.05) | 0.017 |
| HDP (+SGA) | 7 | 1.33 (0.52, 3.36) | 1.28 (0.47, 3.42) | 0.622 |
| *Total SDQ (cut-off ≥17) Age 7c* |  |  |  |  |
| HDP (not SGA) | 58 | 0.99 (0.72, 1.35) | 0.95 (0.69, 1.33) | 0.807 |
| HDP (+SGA) | 8 | 1.10 (0.45, 2.65) | 1.04 (0.43, 2.53) | 0.914 |
| *Total SDQ (cut-off ≥17) Age 11c* |  |  |  |  |
| HDP (not SGA) | 70 | 1.20 (0.89, 1.63) | 1.11 (0.81, 1.54) | 0.485 |
| HDP (+SGA) | 8 | 1.12 (0.49, 2.55) | 1.01 (0.44, 2.30) | 0.967 |
| *Total SDQ (cut-off ≥17) Age 14c* |  |  |  |  |
| HDP (not SGA) | 69 | 1.03 (0.76, 1.39) | 0.99 (0.72, 1.36) | 0.992 |
| HDP (+SGA) | 7 | 0.76 (0.29, 1.97) | 0.69 (0.26, 1.81) | 0.461 |
| aCrude analysis.  bAdjusted for maternal age, maternal education, maternal smoking status, maternal alcohol consumption during pregnancy, pre-pregnancy BMI, household income, infant sex, parity and ethnic origin.  Abbreviations: SGA, small for gestational age; OR, odds ratio; 95% CI, 95% confidence interval; SDQ, Strengths and Difficulties Questionnaire; HDP, hypertensive disorders of pregnancy.  cReference: No HDP and not SGA | | | | |

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| **eTable 3: Association between Hypertensive Disorders of Pregnancy and total Strengths and Difficulties Questionnaire cut-off at ages 3, 5, 7, 11 and 14 years among Millennium Cohort Study Participants by Level of Deprivation** | | | | | | |
|  | **Highest deprivation (deciles 1–5)** | | | **Lowest deprivation (deciles 6–10)** | | |
|  | **Exposed Cases:**  **SDQ cut-off** | **Model 1a**  **OR (95% CI)** | **Model 2b**  **OR (95% CI)** | **Exposed Cases:**  **SDQ cut-off** | **Model 1a**  **OR (95% CI)** | **Model 2b**  **OR (95% CI)** |
| *Total SDQ (cut-off ≥17) Age 3c* |  |  |  |  |  |  |
| HDP | 65 | 1.06 (0.77, 1.47) | 1.21 (0.86, 1.69) | 29 | 1.13 (0.66, 1.95) | 1.10 (0.61, 1.96) |
| *Total SDQ (cut-off ≥17) Age 5c* |  |  |  |  |  |  |
| HDP | 44 | 1.40 (0.96, 2.04) | 1.53 (1.03, 2.28) | 18 | 1.36 (0.67, 2.75) | 1.34 (0.65, 2.75) |
| *Total SDQ (cut-off ≥17) Age 7c* |  |  |  |  |  |  |
| HDP | 40 | 1.04 (0.70, 1.54) | 1.03 (0.68, 1.55) | 13 | 0.65 (0.30, 1.44) | 0.64 (0.28, 1.47) |
| *Total SDQ (cut-off ≥17) Age 11c* |  |  |  |  |  |  |
| HDP | 44 | 1.20 (0.81, 1.77) | 1.15 (0.76, 1.74) | 21 | 0.93 (0.50, 1.74) | 0.80 (0.41, 1.54) |
| *Total SDQ (cut-off ≥17) Age 14c* |  |  |  |  |  |  |
| HDP | 45 | 1.04 (0.70, 1.53) | 1.03 (0.69, 1.55) | 19 | 0.72 (0.37, 1.40) | 0.64 (0.32, 1.30) |
| aCrude analysis.  bAdjusted for maternal age, maternal education, maternal smoking status, maternal alcohol consumption during pregnancy, pre-pregnancy BMI, household income, infant sex, parity and ethnic origin.  Abbreviations: OR, odds ratio; 95% CI, 95% confidence interval; SDQ, Strengths and Difficulties Questionnaire; HDP, hypertensive disorders of pregnancy.  cReference: No HDP | | | | | | |

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| **eTable 4: Association between Hypertensive Disorders of Pregnancy and total Strengths and Difficulties Questionnaire cut-off, (among participants selected based on having complete exposure, outcome and covariate data) at ages 3, 5, 7, 11 and 14 years among Millennium Cohort Study Participants** | | |
| ***Exposure to HDP (age 3 years)*** | **Exposed Cases:**  **HDP+SDQ cut-off** | **AdjustedOR (95% CI)a** |
| *Total SDQ (cut-off ≥17)* | 44 | 1.17 (0.78, 1.75) |
| ***Exposure to HDP (age 5 years)*** |  |  |
| *Total SDQ (cut-off ≥17)* | 33 | 1.85 (1.14, 3.01) |
| ***Exposure to HDP (age 7 years)*** |  |  |
| *Total SDQ (cut-off ≥17)* | 26 | 0.91 (0.55, 1.51) |
| ***Exposure to HDP (age 11 years)*** |  |  |
| *Total SDQ (cut-off ≥17)* | 35 | 0.88 (0.56, 1.36) |
| ***Exposure to HDP (age 14 years)*** |  |  |
| *Total SDQ (cut-off ≥17)* | 41 | 0.95 (0.63, 1.44) |
| aAdjusted for maternal age, maternal education, maternal smoking status, maternal alcohol consumption during pregnancy, pre-pregnancy BMI, household income, infant sex, parity and ethnic origin.  Abbreviations: HDP, hypertensive disorders of pregnancy; OR, odds ratio; 95% CI, 95% confidence interval; SDQ, Strengths and Difficulties Questionnaire. | | |

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| **eTable 5: Association between Hypertensive Disorders of Pregnancy and teacher-reported total Strengths and Difficulties Questionnaire cut-off at ages 7 and 11 years among Millennium Cohort Study Participants** | | |
| ***Exposure to HDP (age 7 years)*** | **Exposed Cases:**  **HDP+SDQ cut-off** | **AdjustedOR (95% CI)a** |
| *Total SDQ (cut-off ≥17)* | 60 | 1.40 (0.97, 2.02) |
| ***Exposure to HDP (age 11 years)*** |  |  |
| *Total SDQ (cut-off ≥17)* | 30 | 0.90 (0.54, 1.47) |
| aAdjusted for maternal age, maternal education, maternal smoking status, maternal alcohol consumption during pregnancy, pre-pregnancy BMI, household income, infant sex, parity and ethnic origin.  Abbreviations: HDP, hypertensive disorders of pregnancy; OR, odds ratio; 95% CI, 95% confidence interval; SDQ, Strengths and Difficulties Questionnaire. | | |

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| **eTable 6: Association between Hypertensive Disorders of Pregnancy and total Strengths and Difficulties Questionnaire cut-off at ages 3, 5, 7, 11 and 14 years among Millennium Cohort Study Participants (further adjusted for maternal depression/mental illness during pregnancy)** | | |
| ***Exposure to HDP (age 3 years)*** | **Exposed Cases:**  **HDP+SDQ cut-off** | **AdjustedOR (95% CI)a** |
| *Total SDQ (cut-off ≥17)* | 115 | 1.25 (0.98, 1.61) |
| ***Exposure to HDP (age 5 years)*** |  |  |
| *Total SDQ (cut-off ≥17)* | 72 | 1.41 (1.04, 1.91) |
| ***Exposure to HDP (age 7 years)*** |  |  |
| *Total SDQ (cut-off ≥17)* | 66 | 0.95 (0.70, 1.29) |
| ***Exposure to HDP (age 11 years)*** |  |  |
| *Total SDQ (cut-off ≥17)* | 79 | 1.07 (0.79, 1.44) |
| ***Exposure to HDP (age 14 years)*** |  |  |
| *Total SDQ (cut-off ≥17)* | 77 | 0.95 (0.70, 1.28) |
| aAdjusted for **maternal depression/mental illness during pregnancy**, maternal age, maternal education, maternal smoking status, maternal alcohol consumption during pregnancy, pre-pregnancy BMI, household income, infant sex, parity and ethnic origin.  Abbreviations: HDP, hypertensive disorders of pregnancy; OR, odds ratio; 95% CI, 95% confidence interval; SDQ, Strengths and Difficulties Questionnaire. | | |