**Supplements**

Table S1. Associations between Birth Characteristics and Three Subtypes Perimenopausal Disorders, Additional Censored on Hysterectomy and Oophorectomy (n=2993 Women)

Table S2. Associations of Early Life and Adult Characteristics with Perimenopausal Disorders and Its Subtypes

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Fig. S1. Instantaneous Incidence Rate for Perimenopausal Disorders based on Kaplan-Meier Estimator (n=218 Disorders among 3212 Women)

**Table S1. Associations between Birth Characteristics and Three Subtypes Perimenopausal Disorders, Additional Censored on Hysterectomy and Oophorectomya (n=2993 Women)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Perimenopausal Disorders** |  | **Person-Years at Risk** | **Birth Characteristics** | **Minimally Adjusted Modelb** | **Adjusted Model 1c** | **Adjusted Model 2d** |
|  |  |  |  | **HR**  **(95% CI)** | **HR**  **(95% CI)** | **HR**  **(95% CI)** |
| Menopausal and climacteric states  (n=110) |  | 21,460 | Birth weighte | 1.84  (1.26-2.70) | 1.72  (1.16-2.54) | 1.74  (1.17-2.58) |
|  |  |  | Gestational agef | 0.96  (0.86-1.07) | 0.96  (0.86-1.08) | 0.96  (0.86-1.08) |
|  |  |  |  |  |  |  |
| Perimenopausal bleeding  (n=56) |  | 21,735 | Birth weight | 0.75  (0.43-1.32) | 0.76  (0.42-1.37) | 0.74  (0.40-1.37) |
|  |  |  | Gestational age | 0.90  (0.79-1.03) | 0.91  (0.80-1.02) | 0.90  (0.80-1.03) |
|  |  |  |  |  |  |  |
| Other perimenopausal disorders  (n=54) |  | 21,776 | Birth weight | 1.16  (0.70-1.90) | 0.97  (0.57-1.62) | 0.95  (0.56-1.62) |
|  |  |  | Gestational age | 0.84  (0.76-0.93) | 0.84  (0.75-0.94) | 0.85  (0.76-0.96) |

Abbreviation: HR, hazard ratio; CI, confidence interval.

a Diagnostic codes for hysterectomy: 7210, 7211, 7261, 7262, 7467, LCD00-04, LCC10, LCD10, LCD11, LEF13; for oophorectomy: 7020, 7021, 7030-32, LAE10, LAE11, LAE20, LAE21, LAF00, LAF01, LAF10, LAF11, LAF20.

b Minimally adjusted for birth weight or gestational age, plus birth year in categories.

c Model 1 additionally adjusted for parental education, mother’s marital status, age, and parity at birth.

d Model 2 is model 1 additionally adjusted for number of live births, own education, and family disposable income in the year 2000.

e Birth weight is change per 1 kilogram increase.

f Gestational age is change per additional completed week.

**Table S2. Associations of Early Life and Adult Characteristics with Perimenopausal Disorders and Its Subtypes**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Perimenopausal Disorders** | | **Menopausal and Climacteric States** | | **Perimenopausal Bleeding** | | **Other Perimenopausal Disorders** | |
|  | **No. of Womena** | **No. of Cases** | **HRb**  **(95% CI)** | **No. of Cases** | **HRb**  **(95% CI)** | **No. of Cases** | **HRb**  **(95% CI)** | **No. of Cases** | **HRb**  **(95% CI)** |
| **Early Life Characteristics** | | |  |  |  |  |  |  |  |
| Parental education |  |  |  |  |  |  |  |  |  |
| Elementary | 1759 | 102 | 1  [Reference] | 56 | 1  [Reference] | 30 | 1  [Reference] | 27 | 1  [Reference] |
| Shorter secondary | 929 | 62 | 1.12  (0.80-1.55) | 40 | 1.32  (0.87-2.02) | 17 | 0.99  (0.55-1.78) | 17 | 1.23  (0.66-2.30) |
| Longer secondary | 352 | 37 | 1.95  (1.35-2.82) | 19 | 1.82  (1.09-3.04) | 9 | 1.39  (0.66-2.93) | 11 | 2.39  (1.18-4.84) |
| Tertiary education | 172 | 17 | 1.75  (1.05-2.93) | 10 | 1.92  (0.94-3.90) | 5 | 1.54  (0.60-3.92) | 3 | 1.31  (0.40-4.33) |
| Mother’s marital status |  |  |  |  |  |  |  |  |  |
| Married | 2845 | 197 | 1  [Reference] | 114 | 1  [Reference] | 52 | 1  [Reference] | 54 | 1  [Reference] |
| Unmarried | 300 | 16 | 0.80  (0.47-1.36) | 7 | 0.58  (0.27-1.26) | 8 | 1.93  (0.88-4.21) | 3 | 0.45  (0.14-1.46) |
| Mother’s age |  |  |  |  |  |  |  |  |  |
| <20 | 265 | 18 | 1.05  (0.64-1.71) | 12 | 1.19  (0.65-2.17) | 4 | 1.12  (0.41-3.08) | 3 | 0.48  (0.15-1.56) |
| 20-34 | 2704 | 188 | 1  [Reference] | 107 | 1  [Reference] | 53 | 1  [Reference] | 52 | 1  [Reference] |
| ≥35 | 236 | 12 | 1.20  (0.66-2.21) | 6 | 1.11  (0.46-2.65) | 4 | 1.06  (0.39-2.89) | 3 | 1.76  (0.52-5.99) |
| Mother’s parity |  |  |  |  |  |  |  |  |  |
| 1 | 1403 | 90 | 1  [Reference] | 49 | 1  [Reference] | 25 | 1  [Reference] | 19 | 1  [Reference] |
| 2 | 1023 | 69 | 1.05  (0.76-1.45) | 43 | 1.25  (0.83-1.90) | 17 | 0.76  (0.40-1.43) | 22 | 1.98  (1.05-3.70) |
| 3-9 | 719 | 54 | 1.35  (0.95-1.90) | 29 | 1.39  (0.88-2.21) | 18 | 1.17  (0.62-2.21) | 16 | 2.71  (1.36-5.41) |

**Table S2. Associations of Early Life and Adult Characteristics with Perimenopausal Disorders and Its Subtypes (continued)**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Perimenopausal Disorders** | | **Menopausal and Climacteric States** | | **Perimenopausal Bleeding** | | **Other Perimenopausal Disorders** | |
|  | **No. of Womena** | **No. of Cases** | **HRb**  **(95% CI)** | **No. of Cases** | **HRb**  **(95% CI)** | **No. of Cases** | **HRb**  **(95% CI)** | **No. of Cases** | **HRb**  **(95% CI)** |
| **Adult Characteristics** | | | | | | | | | |
| Number of live births |  |  |  |  |  |  |  |  |  |
| 0 | 388 | 16 | 1  [Reference] | 14 | 1  [Reference] | 2 | 1  [Reference] | 6 | 1  [Reference] |
| 1 | 466 | 31 | 1.60  (0.85-3.02) | 17 | 0.97  (0.46-2.05) | 5 | 2.24  (0.43-11.53) | 11 | 1.39  (0.51-3.79) |
| 2 | 1401 | 91 | 1.51  (0.86-2.65) | 55 | 1.01  (0.54-1.89) | 26 | 3.85  (0.91-16.38) | 19 | 0.75  (0.30-1.89) |
| 3-7 | 957 | 80 | 1.97  (1.11-3.50) | 39 | 1.06  (0.55-2.04) | 28 | 5.99  (1.42-25.27) | 22 | 1.32  (0.53-3.29) |
| Education |  |  |  |  |  |  |  |  |  |
| Elementary | 697 | 32 | 1  [Reference] | 19 | 1  [Reference] | 9 | 1  [Reference] | 6 | 1  [Reference] |
| Shorter secondary | 1260 | 84 | 1.44  (0.95-2.19) | 53 | 1.55  (0.90-2.69) | 22 | 1.12  (0.52-2.40) | 21 | 2.26  (0.90-5.65) |
| Longer secondary | 795 | 60 | 1.63  (1.05-2.54) | 30 | 1.39  (0.76-2.53) | 19 | 1.48  (0.67-3.26) | 17 | 3.04  (1.17-7.89) |
| Tertiary education | 459 | 42 | 1.96  (1.22-3.15) | 23 | 1.84  (0.97-3.50) | 11 | 1.50  (0.63-3.55) | 14 | 4.20  (1.59-11.05) |
| Family disposable income |  |  |  |  |  |  |  |  |  |
| 4th (lowest) | 803 | 50 | 1  [Reference] | 32 | 1  [Reference] | 10 | 1  [Reference] | 12 | 1  [Reference] |
| 3rd | 802 | 61 | 1.25  (0.86-1.83) | 32 | 1.02  (0.61-1.68) | 18 | 1.87  (0.87-4.05) | 21 | 1.77  (0.87-3.59) |
| 2nd | 803 | 49 | 0.95  (0.64-1.41) | 24 | 0.73  (0.43-1.23) | 18 | 1.66  (0.77-3.60) | 14 | 1.20  (0.56-2.59) |
| 1st (highest) | 804 | 58 | 1.08  (0.74-1.59) | 37 | 1.09  (0.67-1.77) | 15 | 1.34  (0.60-2.96) | 11 | 0.92  (0.41-2.11) |

Abbreviation: HR, hazard ratio; CI, confidence interval.

a Numbers add up to less than 3212 for some covariates due to missing data.

b Adjusted for birth year in categories.

**Table S3.** **Association between Categorical Birth Weight and Menopausal and Climacteric States (n=125 Disorders in 3212 Women)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Birth Weight** | **No. (%)** | **Minimally Adjusted Modela** | **Adjusted Model 1b** | **Adjusted Model 2c** |
|  |  | **HR**  **(95% CI)** | **HR**  **(95% CI)** | **HR**  **(95% CI)** |
| <3.0 kg | 492 (15%) | 0.66  (0.34-1.28) | 0.70  (0.36-1.37) | 0.70  (0.36-1.36) |
| 3.0-3.4 kg | 1198 (37%) | 1  [Reference] | 1  [Reference] | 1  [Reference] |
| 3.5-3.9 kg | 1134 (35%) | 1.17  (0.77-1.80) | 1.16  (0.76-1.77) | 1.13  (0.74-1.73) |
| ≥4.0 kg | 388 (12%) | 1.82  (1.11-3.00) | 1.80  (1.10-2.94) | 1.80  (1.10-2.95) |

Abbreviation: HR, hazard ratio; CI, confidence interval.

a Minimally adjusted for gestational age and birth year in categories.

b Model 1 additionally adjusted for parental education, mother’s marital status, age, and parity at birth.

c Model 2 is model 1 additionally adjusted for number of live births, own education, and family disposable income in the year 2000.

**Table S4.** **Associations of Birth Weight and Ponderal Index with Three Subtypes Perimenopausal Disorders (n=3212 Women)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Perimenopausal Disorders** | **Person-Years at Risk** | **Birth Characteristics** | **Minimally Adjusted Modela** | **Adjusted Model 1b** | **Adjusted Model 2c** |
|  |  |  | **HR**  **(95% CI)** | **HR**  **(95% CI)** | **HR**  **(95% CI)** |
| Menopausal and climacteric states  (n=125) | 23,535 | Birth weightd | 1.28  (1.07-1.54) | 1.26  (1.04-1.52) | 1.26  (1.04-1.53) |
|  |  | Ponderal indexe | 1.30  (1.10-1.54) | 1.27  (1.07-1.51) | 1.27  (1.07-1.51) |
| Perimenopausal bleeding  (n=61) | 23,827 | Birth weight | 0.86  (0.65-1.13) | 0.86  (0.65-1.15) | 0.85  (0.64-1.14) |
|  |  | Ponderal index | 0.83  (0.63-1.10) | 0.83  (0.63-1.10) | 0.82  (0.62-1.10) |
| Other perimenopausal disorders  (N=58) | 23,925 | Birth weight | 1.13  (0.89-1.44) | 1.04  (0.81-1.35) | 1.03  (0.80-1.34) |
|  |  | Ponderal index | 1.16  (0.89-1.51) | 1.10  (0.84-1.44) | 1.08  (0.82-1.43) |

Abbreviation: HR, hazard ratio; CI, confidence interval.

a Minimally adjusted for gestational age and birth year in categories.

b Model 1 additional adjusted for parental education, mother’s marital status, age, and parity at birth.

c Model 2 is model 1 adjusted for number of live births, own education, and family disposable income in the year 2000.

d,e change per standard deviation increase.

**Table S5. Associations of birth weight and gestational age with three subtypes perimenopausal disorders, fully adjusted models (n=3212 Women)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Perimenopausal Disorders** | **Person-Years at Risk** | **Minimally Adjusted Modela HR (95%CI)** | **Further Adjusted Modelb HR (95% CI)** | **Fully Adjusted Modelc HR (95% CI)** |
| **Menopausal and Climacteric States** | | | | |
| Birth weightd | 23,535 | 1.66 (1.14-2.41) | 1.59 (1.09-2.33) | 1.60 (1.08-2.37) |
| Gestational agee | 23,535 | 1.00 (0.91-1.10) | 1.00 (0.91-1.10) | 1.00 (0.91-1.10) |
| **Perimenopausal Bleeding** | | | | |
| Birth weight | 23,827 | 0.73 (0.42-1.27) | 0.74 (0.42-1.33) | 0.72 (0.40-1.31) |
| Gestational age | 23,827 | 0.90 (0.80-1.01) | 0.90 (0.81-1.00) | 0.89 (0.80-1.00) |
| **Other Perimenopausal Disorders** | | | | |
| Birth weight | 23,925 | 1.29 (0.79-2.10) | 1.09 (0.65-1.83) | 1.07 (0.63-1.82) |
| Gestational age | 23,925 | 0.87 (0.79-0.95) | 0.86 (0.78-0.94) | 0.86 (0.78-0.95) |

Abbreviation: HR, hazard ratio; CI, confidence interval.

a Minimally adjusted for birth year in categories, birth weight was additionally adjusted by gestational age.

b Further adjusted models additionally adjusted for parental education, mother’s marital status, age, and parity at birth.

c Fully adjusted models is model 1 additionally adjusted for number of live births, own education, and family disposable income in the year 2000.

d Birth weight is change per 1 kilogram increase.

e Gestational age is change per additional completed week.

**Fig. S1.** **Instantaneous Incidence Rate for Perimenopausal Disorders based on Kaplan-Meier Estimator (n=218 Disorders among 3212 Women)**

