**Supplementary Table 1.** Frequency of congenital gastrointestinal tract atresia in this population (89,495 live births without chromosomal anomalies, including Down syndrome, trisomy 18, or trisomy 13)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 　 | 　 | 　 | No. of cases |  Frequency (per 10,000 births) |
| Congenital gastrointestinal tract atresia | 74 | 8·3  |
|  | Oesophageal atresia | 12 | 1·3  |
|  | Small intestinal atresia | 24 | 2·7  |
|  |  | Duodenal atresia  | 10 | 1·1  |
|  |  | Jejunoileal atresia | 16 | 1·8  |
| 　 | Anorectal malformation | 43 | 4·8  |

**Supplementary Table 2.** Congenital gastrointestinal tract atresia in association with three groups of fish consumption in early pregnancy, based on the US Food and Drug Administration's recommendation

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | Fish consumption in early pregnancy |  |  |
|  |  |  |  | < 170 g/week (n = 32,076) | 170-340 g/week (n = 35,471) | > 340 g/week (n = 21,948) |  | *P* for trend\* |
| 　 | 　 | 　 | 　 | 　 | OR (95% CI) | OR (95% CI) | 　 |
| Congenital gastrointestinal tract atresia (74 cases) |  |  |  |
|  |  |  | No. of cases | 32  | 34  | 8  |  |  |
|  |  |  | Maternal age adjusted model | Reference | 0·9 (0·6, 1·5) | 0·4 (0·2, 0·8) |  | 0·02 |
|  |  |  | Multivariable model† | Reference | 0·9 (0·5, 1·5) | 0·4 (0·2, 0·9) |  | 0·03 |
|  |  |  | Multivariable model2‡ | Reference | 0·6 (0·3, 1·4) | 0·4 (0·1, 1·2) |  | 0·09 |
|  | Oesophageal atresia (12 cases) |  |  |  |  |
|  |  |  | No. of cases | 6  | 6  | 0  |  |  |
|  |  |  | Maternal age adjusted model | Reference | 0·9 (0·3, 2·7) |  |  | 0·08 |
|  | Small intestinal atresia (24 cases) |  |  |  |  |
|  |  |  | No. of cases | 12  | 9  | 3  |  |  |
|  |  |  | Maternal age adjusted model | Reference | 0·7 (0·3, 1·6) | 0·4 (0·1, 1·3) |  | 0·11 |
|  |  | Duodenal atresia (10 cases) |  |  |  |  |
|  |  |  | No. of cases | 6  | 2  | 2  |  |  |
|  |  |  | Maternal age adjusted model | Reference | 0·3 (0·1, 1·5) | 0·5 (0·1, 2·4) |  | 0·24 |
|  |  | Jejunoileal atresia (16 cases) |  |  |  |  |
|  |  |  | No. of cases | 6  | 8  | 2  |  |  |
|  |  |  | Maternal age adjusted model | Reference | 1·3 (0·4, 3·6) | 0·5 (0·1, 2·6) |  | 0·53 |
|  | Anorectal malformation (43 cases) |  |  |  |  |
|  |  |  | No. of cases | 19  | 19  | 5  |  |  |
|  |  |  | Maternal age adjusted model | Reference | 0·9 (0·5, 1·7) | 0·4 (0·1, 1·0) |  | 0·06 |

CI, confidence interval; OR, odds ratio.

\*Linear trends were assessed by assignment of ordinal variables for fish consumption tertile.

†Adjusted for maternal age at delivery, educational background, household income, occupation in early pregnancy, smoking habits, alcohol consumption, body mass index before pregnancy, current history of diabetes or gestational diabetes, parity, infertility treatment, use of folic acid supplement, use of docosahexaenoic acid and/or eicosapentaenoic acid supplements, and vegetable consumption in early pregnancy.

‡Additionally adjusted for paternal age at delivery (n = 46,455).

**Supplementary Table 3.** Fish consumption in mid-late pregnancy and congenital gastrointestinal tract atresia\*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | Tertile of fish consumption in mid-late pregnancy |  |  |
|  |  |  |  | Low (< 18·7 g/day)(n = 29,493) | Middle(18·7-36·7 g/day) (n = 29,505) | High (> 36·7 g/day)(n = 29,490) |  | *P* for trend† |
| 　 | 　 | 　 | 　 | 　 | OR (95% CI) | OR (95% CI) | 　 |
|  |  |  | Median fish intake (g/day) | 9·2  | 27·2  | 50·2  |  |  |
| Congenital gastrointestinal tract atresia (73 cases) |  |  |  |  |
|  |  |  | No. of cases | 29  | 29  | 15  |  |  |
|  |  |  | Maternal age adjusted model | Reference | 1·0 (0·6, 1·7) | 0·5 (0·3, 0·9) |  | 0·04 |
|  |  |  | Multivariable model‡ | Reference | 1·0 (0·6, 1·7) | 0·5 (0·3, 1·0) |  | 0·06 |
|  |  |  | Multivariable model2§ | Reference | 0·4 (0·2, 1·1) | 0·5 (0·2, 1·2)  |  | 0·10 |
|  | Oesophageal atresia (11 cases) |  |  |  |  |  |
|  |  |  | No. of cases | 5  | 3  | 3  |  |  |
|  |  |  | Maternal age adjusted model | Reference | 0·6 (0·1, 2·5)  | 0·4 (0·1, 2·3)  |  | 0·43 |
|  | Small intestinal atresia (24 cases) |  |  |  |  |
|  |  |  | No. of cases | 14  | 5  | 5  |  |  |
|  |  |  | Maternal age adjusted model | Reference | 0·4 (0·1, 1·0) | 0·4 (0·1, 1·0) |  | 0·03 |
|  |  | Duodenal atresia (10 cases) |  |  |  |  |  |
|  |  |  | No. of cases | 6  | 2  | 2  |  |  |
|  |  |  | Maternal age adjusted model | Reference | 0·3 (0·1, 1·6)  | 0·3 (0·1, 1·6) |  | 0·13 |
|  |  | Jejunoileal atresia (16 cases) |  |  |  |  |  |
|  |  |  | No. of cases | 9  | 3  | 4  |  |  |
|  |  |  | Maternal age adjusted model | Reference | 0·3 (0·1, 1·3) | 0·5 (0·2, 1·5) |  | 0·15 |
|  | Anorectal malformation (43 cases) |  |  |  |  |
|  |  |  | No. of cases | 15  | 21  | 7  |  |  |
| 　 | 　 |  | Maternal age adjusted model | Reference | 1·4 (0·7, 2·7) | 0·5 (0·2, 1·1) | 　 | 0·12 |

CI, confidence interval; OR, odds ratio.

\*We included 88,488 women who had valid data on food-frequency questionnaire during the second/third trimester and delivered their infants > 28 weeks of gestation.

†Linear trends were assessed by assignment of ordinal variables for fish consumption tertile.

‡ Adjusted for maternal age at delivery, educational background, household income, occupation in early pregnancy, smoking habits, alcohol consumption, body mass index before pregnancy, current history of diabetes or gestational diabetes, parity, infertility treatment, use of folic acid supplement, use of docosahexaenoic acid and/or eicosapentaenoic acid supplements, and vegetable consumption in early pregnancy.

§Additionally adjusted for paternal age at delivery (n = 46,049).

**Supplementary Table 4.** Association of n-3 polyunsaturated fatty acid consumption in mid-late pregnancy with congenital gastrointestinal tract atresia\*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | Tertile |  |  |
|  |  | Low | Middle | High |  | *P* for trend† |
| 　 | 　 | 　 | OR (95% CI) | OR (95% CI) | 　 |
| n-3 polyunsaturated fatty acid-rich fish consumption‡ |  |  |  |
|  | Median intake (g/day) | 0  | 9·4  | 21·1  |  |  |
|  | No. of women | 29,492 | 29,500 | 29,496 |  |  |
|  | No. of cases | 26  | 25  | 22  |  |  |
|  | Maternal age adjusted model | Reference | 1·0 (0·5, 1·7) | 0·8 (0·5, 1·5) |  | 0·54 |
|  | Multivariable model§ | Reference | 1·0 (0·5, 1·7) | 0·7 (0·4, 1·4) |  | 0·37 |
|  | Multivariable model2|| | Reference | 0·5 (0·2, 1·3) | 0·5 (0·3, 1·3) |  | 0·14 |
| Consumption of n-3 polyunsaturated fatty acids |  |  |  |  |
|  | Median intake (g/day) | 1·1  | 1·6  | 2·1  |  |  |
|  | No. of women | 29,499 | 29,499 | 29,490 |  |  |
|  | No. of cases | 31  | 20  | 22  |  |  |
|  | Maternal age adjusted model | Reference | 0·6 (0·4, 1·1) | 0·7 (0·4, 1·2) |  | 0·19 |
|  | Multivariable model§ | Reference | 0·6 (0·3, 1·0) | 0·7 (0·4, 1·2) |  | 0·18  |
|  | Multivariable model2|| | Reference | 0·2 (0·1, 0·7) | 0·7 (0·3, 1·6) | 　 | 0·31  |

CI, confidence interval; OR, odds ratio.

\*We included 88,488 women who had valid data on food frequency questionnaire during the second/third trimester and delivered their infants > 28 weeks of gestation.

†Linear trends were assessed by assignment of ordinal variables for tertile.

‡Six fish items (salmon or trout, Japanese amberjack, sea bream, horse mackerel or sardine, saury or mackerel, and eel).

§Adjusted for maternal age at delivery, educational background, household income, occupation in early pregnancy, smoking habits, alcohol consumption, body mass index before pregnancy, current history of diabetes or gestational diabetes, parity, infertility treatment, use of folic acid supplement, use of docosahexaenoic acid and/or eicosapentaenoic acid supplements, and vegetable consumption in early pregnancy.

|| Additionally adjusted for paternal age at delivery (n = 46,049).

**Supplementary Fig. 1.** Participants for the present analysis of the association between fish consumption in early pregnancy and congenital gastrointestinal tract atresia

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