

Supplemental Material

Organochlorine Pesticides and Risk of Endometriosis: Findings from a Population-Based Case–Control Study

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Table of Contents

| | Page |
|--|------|
| Supplemental Material, Table S1. Odds ratios and 95% confidence intervals for the relationship between individual organochlorine pesticides and endometriosis additionally adjusting for parity and breastfeeding, Group Health, 1996-2001. | 2 |
| Supplemental Material, Table S2. Distribution of serum organochlorine pesticides among controls by history of laparoscopy, Group Health, 1996-2001. | 4 |
| Supplemental Material, Table S3. Distribution of serum organochlorine pesticides among controls by history of infertility testing, Group Health, 1996-2001. | 5 |

Supplemental Material, Table S1. Odds ratios and 95% confidence intervals for the relationship between individual organochlorine pesticides and endometriosis additionally adjusting for parity and breastfeeding, Group Health, 1996-2001.

| Pesticide Quartiles (pg/g serum) | All endometriosis | | Ovarian endometriosis | |
|---|-------------------|---------------------------|-----------------------|---------------------------|
| | Case/control (n) | aOR ^a (95% CI) | Case/Control (n) | aOR ^a (95% CI) |
| β-HCH | | | | |
| ≤26.99 | 49/126 | 1.0 | 17/126 | 1.0 |
| >26.99-43.06 | 41/127 | 0.7 (0.4, 1.3) | 21/127 | 1.0 (0.5, 2.2) |
| >43.06-74.01 | 78/127 | 1.3 (0.8, 2.3) | 42/127 | 1.9 (0.9, 4.1) |
| >74.01 | 64/127 | 1.0 (0.5, 1.8) | 42/127 | 1.7 (0.7, 3.8) |
| γ-HCH^b | | | | |
| ≤10.0 (LOD) | 129/295 | 1.0 | 69/295 | 1.0 |
| >10.0-13.89 | 54/112 | 1.1 (0.8, 1.7) | 29/112 | 1.1 (0.6, 1.9) |
| >13.89 | 61/112 | 1.3 (0.9, 1.9) | 32/112 | 1.2 (0.7, 2.0) |
| ∑HCH (mol/g serum)^c | | | | |
| ≤0.12 | 54/134 | 1.0 | 24/134 | 1.0 |
| >0.12-0.18 | 48/135 | 0.8 (0.5, 1.2) | 21/135 | 0.8 (0.4, 1.7) |
| >0.18-0.29 | 79/134 | 1.2 (0.7, 1.9) | 45/134 | 1.5 (0.8, 2.9) |
| >0.29 | 67/135 | 0.8 (0.5, 1.4) | 42/135 | 1.1 (0.6, 2.3) |
| Heptachlor epoxide | | | | |
| ≤17.10 | 40/110 | 1.0 | 21/110 | 1.0 |
| >17.10-26.19 | 55/110 | 1.5 (0.9, 2.5) | 22/110 | 1.0 (0.5, 2.1) |
| >26.19-42.91 | 59/110 | 1.3 (0.7, 2.2) | 34/110 | 1.2 (0.6, 2.3) |
| >42.91 | 51/109 | 1.0 (0.5, 1.8) | 28/109 | 0.8 (0.4, 1.8) |
| Oxychlordane | | | | |
| ≤28.31 | 52/124 | 1.0 | 24/124 | 1.0 |
| >28.31-51.96 | 46/125 | 0.7 (0.4, 1.2) | 23/125 | 0.7 (0.4, 1.5) |
| >51.96-79.55 | 57/126 | 0.8 (0.5, 1.4) | 34/126 | 1.0 (0.5, 1.9) |
| >79.55 | 73/124 | 0.8 (0.5, 1.5) | 45/124 | 0.9 (0.5, 2.0) |
| <i>trans</i>-nonachlor | | | | |
| ≤51.37 | 55/134 | 1.0 | 21/134 | 1.0 |
| >51.37-75.15 | 55/135 | 0.9 (0.6, 1.5) | 31/135 | 1.2 (0.6, 2.4) |
| >75.15-107.65 | 56/134 | 0.9 (0.5, 1.4) | 33/134 | 1.1 (0.5, 2.2) |
| >107.65 | 82/135 | 1.1 (0.6, 1.9) | 47/135 | 1.3 (0.6, 2.8) |
| ∑Chlordane (mol/g serum)^c | | | | |
| ≤0.21 | 53/134 | 1.0 | 23/134 | 1.0 |
| >0.21-0.33 | 56/135 | 1.0 (0.6, 1.7) | 24/135 | 1.0 (0.5, 1.9) |
| >0.33-0.52 | 57/134 | 1.0 (0.6, 1.6) | 36/134 | 1.3 (0.6, 2.5) |
| >0.52 | 82/135 | 1.1 (0.7, 2.0) | 49/135 | 1.3 (0.6, 2.8) |

| Pesticide Quartiles (pg/g serum) | All endometriosis | | Ovarian endometriosis | |
|-------------------------------------|-------------------|---------------------------|-----------------------|---------------------------|
| | Case/control (n) | aOR ^a (95% CI) | Case/Control (n) | aOR ^a (95% CI) |
| <i>p,p'</i> -DDE | | | | |
| ≤905.86 | 55/134 | 1.0 | 25/134 | 1.0 |
| >905.86-1575.51 | 69/134 | 1.1 (0.7, 1.8) | 38/134 | 1.2 (0.7, 2.3) |
| >1575.51-2816.55 | 62/134 | 0.9 (0.5, 1.4) | 31/134 | 0.8 (0.4, 1.6) |
| >2816.55 | 61/135 | 0.8 (0.5, 1.3) | 37/135 | 0.9 (0.4, 1.8) |
| <i>p,p'</i> -DDT | | | | |
| ≤18.79 | 58/128 | 1.0 | 21/128 | 1.0 |
| >18.79-28.36 | 58/128 | 0.8 (0.5, 1.4) | 33/128 | 1.2 (0.6, 2.3) |
| >28.36-44.38 | 55/128 | 0.7 (0.4, 1.1) | 32/128 | 1.0 (0.5, 1.9) |
| >44.38 | 66/129 | 0.8 (0.4, 1.3) | 38/129 | 1.0 (0.5, 2.0) |
| ΣDDT (mol/g serum) ^c | | | | |
| ≤2.88 | 55/135 | 1.0 | 25/135 | 1.0 |
| >2.88-5.03 | 71/134 | 1.2 (0.8, 1.9) | 39/134 | 1.3 (0.7, 2.4) |
| >5.03-8.95 | 59/135 | 0.8 (0.5, 1.4) | 29/135 | 0.8 (0.4, 1.6) |
| >8.95 | 63/134 | 0.9 (0.5, 1.5) | 39/134 | 1.0 (0.5, 2.1) |
| Dieldrin ^d | | | | |
| ≤10.0 (LOD) | 59/151 | 1.0 | 32/151 | 1.0 |
| >10.0-48.18 | 52/97 | 1.2 (0.8, 2.0) | 17/97 | 0.7 (0.3, 1.4) |
| >48.18-73.74 | 65/123 | 1.1 (0.7, 1.7) | 39/123 | 1.0 (0.6, 1.9) |
| >73.74 | 52/124 | 0.7 (0.4, 1.2) | 30/124 | 0.6 (0.3, 1.1) |
| Hexachlorobenzene | | | | |
| ≤159.74 | 49/135 | 1.0 | 23/135 | 1.0 |
| >159.74-278.998 | 71/134 | 1.3 (0.8, 2.1) | 40/134 | 1.5 (0.8, 2.8) |
| >278.998-589.30 | 72/134 | 1.3 (0.8, 2.0) | 35/134 | 1.3 (0.7, 2.4) |
| >589.30 | 56/135 | 0.9 (0.5, 1.5) | 34/135 | 1.0 (0.5, 1.8) |
| Mirex ^b | | | | |
| ≤10.0 (LOD) | 133/320 | 1.0 | 68/320 | 1.0 |
| >10.0-15.47 | 45/97 | 1.1 (0.7, 1.7) | 28/97 | 1.3 (0.7, 2.2) |
| >15.47 | 60/98 | 1.3 (0.9, 2.0) | 29/98 | 1.0 (0.6, 1.8) |

Abbreviations: OR=Odds ratio; 95% CI=95% confidence interval; LOD=limit of detection;

HCH=hexachlorocyclohexane; DDE=dichlorodiphenyldichloroethylene;

DDT=dichlorodiphenyltrichloroethane. ^aOdds ratio adjusted for age, reference date year, smoking, alcohol, education, natural logarithm transformed total lipids, race/ethnicity, and a composite variable for parity and breastfeeding. ^bLowest category consists of values <LOD. Middle and top categories, ≤median or >median, based on observations with values among controls. ^cSummed chemicals used multiple imputation data (five datasets); Quartile cutpoints and frequencies from first imputed dataset. ^dAll samples with values below the level of detection were categorized in the lowest category. Subsequent categories were created using the 50th and 75th percentile among the distribution in controls.

Supplemental Material, Table S2. Distribution of serum organochlorine pesticides among controls by history of laparoscopy, Group Health, 1996-2001.

| Pesticide (pg/g serum) | Past laparoscopy ^a (n=47) Median (IQR) | No past laparoscopy (n=491) Median (IQR) | <i>P</i> -value ^b |
|---------------------------|--|---|------------------------------|
| β-HCH | 47.58 (38.27, 98.72) | 42.74 (26.17, 73.40) | 0.087 |
| γ-HCH | <10.00 (<10.00, 15.13) | <10.00 (<10.00, 13.25) | 0.153 |
| Heptachlor epoxide | 25.69 (19.59, 41.46) | 26.38 (16.75, 43.75) | 0.952 |
| Oxychlorane | 62.40 (43.23, 99.66) | 50.95 (25.62, 77.79) | 0.035 |
| <i>trans</i> -nonachlor | 81.14 (64.14, 131.97) | 73.66 (49.95, 107.35) | 0.045 |
| <i>p,p'</i> -DDE | 1751.52 (825.69, 3798.72) | 1563.26 (909.65, 2776.09) | 0.389 |
| <i>p,p'</i> -DDT | 27.43 (17.49, 54.86) | 28.37 (18.89, 43.83) | 0.927 |
| Dieldrin | 55.88 (<10.00, 77.96) | 46.76 (<10.00, 72.86) | 0.426 |
| Hexachlorobenzene | 387.85 (237.84, 742.02) | 268.66 (156.81, 586.09) | 0.019 |
| Mirex | 10.96 (<10.00, 16.71) | <10.00 (<10.00, 12.79) | 0.020 |

Abbreviations: IQR=Interquartile range; HCH=hexachlorocyclohexane; DDE=dichlorodiphenyldichloroethylene;

DDT=dichlorodiphenyltrichloroethane.

^aHistory of laparoscopy was based on self-report of laparoscopy before the reference date.

^b*P*-value from Wilcoxon rank sum test testing whether the distributions of OCP analyte concentrations are systematically different between controls with and without a history of laparoscopy. For this analysis, serum measurements less than the limit of detection (LOD) were substituted with the value of the limit of detection divided by the square root of two (LOD/√2).

Supplemental Material, Table S3. Distribution of serum organochlorine pesticides among controls by history of infertility testing, Group Health, 1996-2001.

| Pesticide (pg/g serum) | Infertility testing history ^a (n=39) | No infertility testing history (n=499) | P-value ^b |
|---------------------------|--|---|----------------------|
| | Median (IQR) | Median (IQR) | |
| β-HCH | 49.33 (34.51, 83.61) | 42.79 (26.93, 73.72) | 0.263 |
| γ-HCH | 10.74 (<10.00, 14.20) | <10.00 (<10.00, 13.29) | 0.128 |
| Heptachlor epoxide | 23.99 (16.15, 41.37) | 26.38 (17.10, 43.23) | 0.766 |
| Oxychlorane | 54.25 (38.85, 81.49) | 51.15 (27.09, 78.84) | 0.402 |
| <i>trans</i> -nonachlor | 81.24 (69.09, 116.09) | 73.66 (50.86, 107.57) | 0.157 |
| <i>p,p'</i> -DDE | 1732.02 (940.30, 2901.02) | 1574.52 (900.88, 2816.55) | 0.634 |
| <i>p,p'</i> -DDT | 28.86 (17.51, 51.19) | 28.30 (19.04, 44.02) | 0.859 |
| Dieldrin | 50.59 (<10.00, 75.05) | 48.15 (<10.00, 73.67) | 0.727 |
| Hexachlorobenzene | 350.13 (179.59, 685.24) | 277.99 (159.26, 586.45) | 0.361 |
| Mirex | <10.00 (<10.00, 17.44) | <10.00 (<10.00, 12.79) | 0.088 |

Abbreviations: IQR=Interquartile range; HCH=hexachlorocyclohexane; DDE=dichlorodiphenyldichloroethylene;

DDT=dichlorodiphenyltrichloroethane.

^aHistory of infertility was based on self-report of having tests done for infertility.

^bP-value from Wilcoxon rank sum test testing whether the distributions of OCP analyte concentrations are systematically different between controls with and without a history of infertility testing. For this analysis, serum measurements less than the limit of detection (LOD) were substituted with the value of the limit of detection divided by the square root of two (LOD/√2).