

Association between domestic abuse and the development of breast cancer in adult females: a retrospective UK cohort study



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Introduction

Breast cancer is the most commonly diagnosed cancer in females in the UK.¹ Both breast cancer and DA are major global public health priorities, which traditionally affect the same population (adult women).

Previous studies suggest a relationship between abuse exposure and cancer diagnosis.^{2,3} Few studies have explored the link between DA and breast cancer specifically.

A relationship between the two could be explained by several pathways, including: 1) stress-induced activation of the hypothalamic-pituitary axis (HPA); 2) adult health behaviours; and/or 3) reproductive health factors.

Aims

To explore the risk of breast cancer (primary outcome) in adult women (aged 16 years and above) with a GP-recorded DA exposure, compared to women with no recorded exposure.

Methods

Design: Retrospective open cohort study (1st January 1995 to 31st January 2022)

Data Source: IQVIA Medical Research Database (IMRD) UK database

Exposed: Women with a Read code for exposure to DA. Each exposed patient was matched to four unexposed controls, by GP, age (+/- 1 year) and Townsend deprivation quintile.

Unexposed: Women with no GP-coded exposure to DA.

Outcome: Read code corresponding to breast cancer diagnosis

Analyses: Cox regression analysis was used to calculate adjusted hazard ratios (aHR)

Covariates: age, Townsend deprivation quintile, BMI, smoking status, and drinking status at study entry

Sensitivity Analyses: 1) incident-only cases; 2) age treated as a categorical variable to account for non-linear variance in oestrogen levels.

Results

Table 1: Risk of breast cancer diagnosis in those with DA exposure

| | Breast Cancer | |
|--|--------------------|-----------|
| | Exposed | Unexposed |
| Number of Incident Outcomes | 93 | 420 |
| Person-Years | 84327 | 334789 |
| Incidence Rate (per 10,000 person years) | 11.03 | 12.55 |
| Hazard Ratio (95% confidence interval) | 0.89 (0.71 – 1.11) | |
| p-value | 0.295 | |
| Adjusted Hazard Ratio (95% confidence interval)* | 0.87 (0.70 - 1.10) | |
| p-value | 0.250 | |
| Adjusted Hazard Ratio (95% confidence interval)** | 0.89 (0.71 – 1.12) | |
| p-value | 0.317 | |

*Adjusted hazard ratio: adjusted for age as a continuous variable, Townsend deprivation quintile, BMI, smoking status, and drinking status at study entry

**Adjusted hazard ratio: adjusted for age groups, Townsend deprivation quintile, BMI, smoking status and drinking status at study entry

Table 2 Risk of breast cancer diagnosis in those with DA exposure; incident-only cases

| | Breast Cancer | |
|---|--------------------|-----------|
| | Exposed | Unexposed |
| Number of Incident Outcomes | 52 | 206 |
| Person-Years | 44370 | 167097 |
| Incidence Rate (per 10,000 person years) | 11.72 | 12.33 |
| Hazard Ratio (95% confidence interval) | 0.96 (0.71 – 1.30) | |
| p-value | 0.774 | |
| Adjusted Hazard Ratio (95% confidence interval)* | 0.93 (0.68 - 1.27) | |
| p-value | 0.651 | |

*Adjusted hazard ratio: adjusted for age as a continuous variable, Townsend deprivation quintile, BMI, smoking status, and drinking status at study entry

Table 3: Adjusted HRs for risk of breast cancer diagnosis in those with DA exposure by categorical age group

| Age Group | Hazard Ratio (95% CI) | p-value |
|-----------|------------------------|---------|
| 16-25 | Ref group | - |
| >25-40 | 10.98 (4.48 – 26.92) | <0.05 |
| >41-50 | 32.99 (13.51 – 80.55) | <0.05 |
| ≥ 51 | 42.23 (17.23 - 103.47) | <0.05 |

Findings

- No significant association between DA exposure and breast cancer diagnosis in a UK primary care cohort, which was robust to a sensitivity analysis of incident only cases (where DA exposure occurred during the study period) and a second sensitivity analysis where age was treated as a categorical variable to mirror the variations in oestrogen levels across the reproductive lifespan.
- The second sensitivity analysis found that older age conferred a greater risk of breast cancer diagnosis in those with DA exposure, reflecting age-specific incidence trends in the UK.

Conclusion

Findings:

Our analysis found no significant between DA exposure and breast cancer diagnosing in a UK primary care cohort of adult women. This finding was robust to a sensitivity analysis of incident only cases. The second sensitivity analysis found that older age was associated with a greater risk of breast cancer diagnosis, reflecting the age-specific incidence trends in the population.

Limitations:

- Coding in electronic health records can be inaccurate, leading to undetected cases of abuse in the unexposed group, potentially underestimating effect size
- Coding is unable to account for severity of abuse, so there is a possibility that recorded cases of abuse are those that are more severe
- Despite matching for deprivation, we cannot comment on vulnerable populations that can struggle to access primary care (e.g., travellers and migrants)

Strengths:

- Large UK primary care database.

Future Research:

Further research is necessary to explore wider health outcomes amongst those with DA exposure and further research is needed to explore cancer outcomes specifically in survivors of abuse.

References

- Public Health England. Cancer registration statistics, England.
- Fuller-Thomson E, Brennenstuhl S. Making a link between childhood physical abuse and cancer. *Cancer*. 2009;115(14):3341-3350.
- Coker AL, Sanderson M, Fadden MK, Pirisi L. Intimate Partner Violence and Cervical Neoplasia.