

## Letters

### Left Handedness and Breast Cancer Risk

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INTRIGUED BY Olsson and Ingvar's report [1] that left handedness is less common in breast cancer patients compared with a sample of the general population in Sweden, we re-analysed data from an international case-control study [2] in order to examine this issue in a large data set.

The study subjects have been described previously, in a study which examined the relation between handedness and breast cancer *laterality* [3]. The present analysis consists of 4052 cases and 11 909 controls, including subjects with missing information on laterality, usage of bra or handedness. The distribution of handedness and case-control status is shown in Table 1.

Using multiple logistic regression the centre- and age-adjusted odds ratios and 95% confidence intervals for left-handed and ambidextrous, in comparison with right-handed women (reference) were 0.95 (0.76–1.19) and 0.99 (0.84–1.17), respectively. Further adjustment for parity, age at first birth, age at menarche, menopausal status, and obesity index had little influence: the corresponding odds ratios were 0.95 (0.76–1.20)

and 0.99 (0.83–1.17). Combining subjects with unknown handedness with those who were right-handed (the largest group, with more 90% subjects) also had little effect on the adjusted odds ratio associated with left-handedness (0.95; 0.76–1.20) or with ambidexterity (0.98; 0.83–1.17).

Our finding of a very weak and clearly non-significant inverse association of left-handedness with breast cancer does not agree with the results presented by Olsson and Ingvar [1], where a 'highly significant' inverse association was found in a smaller data set. One likely explanation for the divergent results could be these investigators' assumption that the frequency of left-handedness has remained unchanged over time. This is contradicted by surveys from the USA, where the percentage of left-handers increased from 2.2% in 1880 to 11% by 1972, and Australia and New Zealand, where the percentage of left-handers according to birth cohorts rose from 2% in 1880 to 13% in 1969 [4]. In the study by Olsson and Ingvar [1], the median age of the cases was 62 years whereas it was only 41 years in the control group. If a similar birth cohort effect concerning left-handedness were operating in Sweden, it could account for the marked inverse association between left-handedness and breast cancer even under the null hypothesis if comparisons were not age-adjusted. It would be interesting to see the effect of age adjustment in the Swedish data.

An inverse association between left-handedness and breast cancer risk may or may not exist, but it is unlikely that it is as strong as Olsson and Ingvar [1] claim. In any case, cultural influences on handedness are so powerful as to make it a rather poor validity test of possible intrauterine influences on breast cancer risk. By contrast, the reported reversed brain asymmetry among women with breast cancer [5,6], if confirmed, would represent a strong indication that perinatal factors are indeed critical determinants of breast cancer risk.

Table 1. Association of handedness with breast cancer

	Right-handed	Left-handed	Ambidextrous	Unknown
Cases	3725	104	192	31
Controls	10941	320	562	86

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