A study of breast cancer in Irish women

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Herity, B. A., O'Halloran, M. J., Bourke, G. J., and Wilson-Davis, K. (1975). *British Journal of Preventive and Social Medicine*, **29, 178-181. A study of breast cancer in Irish women.** In a study of 100 women with breast cancer and 200 unaffected women the epidemiological characteristic of breast cancer most commonly described—namely, an excess of nonparous women among cases when compared with controls, was not observed. It is suggested that two factors, a dearth of first births born to mothers under 20 years of age and an unusually high proportion of first births when aged 30 years or more, are responsible for this finding. No association was found between breast cancer and socioeconomic status, marital status, age at marriage, age at first pregnancy, parity, or age at menarche. Significant associations with breast cancer included age at natural menopause, hysterectomy, and breast trauma. These findings are discussed.

One of the most consistent observations in studies of breast cancer in women has been the association between high parity and a reduced risk of developing the disease, and the interpretation of this epidemiological characteristic has been that pregnancy or a concomitant of pregnancy affords protection against breast cancer, and that the amount of protection is related to the total number of pregnancies. A recent collaborative international study has further elucidated the nature of the protective effect of pregnancy (Salber, Trichopoulos, and MacMahon, 1969; Valaoras *et al.*, 1969; Lowe and MacMahon, 1970; MacMahon *et al.*, 1970b; Yuasa and MacMahon, 1970). Analyses of data from all centres included in the study have shown a decreased risk of breast cancer strongly associated with age at first pregnancy. The association with high parity appears to reflect only an early start to childbearing, those women who had early first pregnancies tended ultimately to have large families. Since no study of the epidemiological features of breast cancer in the Republic of Ireland had previously been done, and in the light of the unusual demographic characteristics of late marriage and late first pregnancies associated with high fertility rates, this study was carried out in 1972-73.

METHOD

Altogether 100 breast cancer cases selected randomly from the outpatient register of St Luke's

Hospital, Dublin, were compared with a presenting sample of 200 controls attending the fracture clinics of St Vincent's and the Mater Misericordiae hospitals in Dublin during the same period. Breast cancer patients aged under 35 years were matched with controls who were within two years of the same age, and where cases were over 35 years of age controls were required to be over 35 years, but age-matching was not considered necessary. Cases and controls were interviewed by one of us (BH) and a precoded questionnaire was used to obtain detailed information of marital, reproductive, and family history, history of previous illness, and smoking habits. The height of cases and controls was measured and controls were examined to exclude the possibility of their having breast cancer.

RESULTS

AGE AND SOCIOECONOMIC STATUS

Although age-matching of controls was carried out only for breast cancer patients who were aged under 35 years, the overall age distributions of cases and controls were similar, the mean age of both groups being 57.3 years. There were no significant differences in socioeconomic status as measured by mean duration of schooling (cases 10.3 years; controls 10.5 years; $p=0.34$), by father's occupation ($p>0.10$), and by husband's occupation ($p>0.10$) in the case of the evermarried women.

MARITAL STATUS

There was no significant difference between cases and controls for marital status (Table I). Twenty-four cases (24.0%) and 54 controls (27.0%) had never married, and none of the single women at interview gave a history of pregnancy.

TABLE I
MARITAL STATUS

Women	Single	Married	Widowed	Separated	Total
Cases	24 (24.0)	49 (49.0)	24 (24.0)	3 (3.0)	100 (100)
Controls	54 (27.0)	92 (46.0)	51 (25.5)	3 (1.5)	200 (100)

$\chi^2=0.3584$, $df=2$, $0.90>P>0.80$
Percentages are given in parentheses

AGE AT MARRIAGE AND AT FIRST PREGNANCY

The mean ages at marriage for cases and controls were 28.1 and 26.9 years respectively ($P=0.22$), and the mean ages at first pregnancy were 28.2 and 27.4 ($P=0.36$). It will be seen (Table II) that only three cases (4.6%) and four controls (3.3%) had their first pregnancies when under 20 years of age, and a high proportion of both cases (41.6%) and controls (32.5%) had their first pregnancies at the age of 30 years or later.

TABLE II
AGE IN YEARS AT FIRST PREGNANCY

Women	<20	20-24	25-29	30-34	35+	Total
Cases	3 (4.6)	17 (26.2)	18 (27.6)	17 (26.2)	10 (15.4)	65* (100)
Controls	4 (3.3)	37 (30.1)	42 (34.1)	29 (23.6)	11 (8.9)	123* (100)

*35 cases and 77 controls had never been pregnant
 $\chi^2=2.1739$, $df=3$, $0.60>P>0.50$
Percentages are given in parentheses

PARITY AND LACTATION EXPERIENCE

Cases and controls did not differ significantly in total parity (Table III), nor were differences observed in their abortion or stillbirth experiences.

TABLE III
PARITY OF MARRIED WOMEN

Women	0	1-4	5-8	9+	Total
Cases	11 (14.5)	34 (44.7)	21 (27.6)	10 (13.2)	76 (100)
Controls	23 (15.8)	60 (41.1)	48 (32.9)	15 (10.2)	146 (100)

$\chi^2=0.9828$, $df=3$, $0.90>P>0.80$
Percentages are given in parentheses

In the light of information from other studies a detailed history of lactation experience was not undertaken but women who had liveborn babies were asked if they had breastfed these babies. Altogether 49 cases (75.4%) and 86 controls (69.9%) had had some breastfeeding experience.

MENSTRUAL HISTORY

The mean age at menarche for cases was 13.9 years and for controls 14.0 years ($P=0.59$). There was a trend for more cases than controls to report age at menarche as 12 years or younger, but it is not significant ($P=0.50$).

Age at natural menopause is shown (Table IV) and was significantly later for cases than controls. Cases who had an artificial menopause induced as part of their treatment for breast cancer are not included in the total.

TABLE IV
AGE IN YEARS AT NATURAL MENOPAUSE

Women	$\bar{x}$	SD	N
Cases	47.33	4.21	57*
Controls	45.97	4.57	128*

*43 cases and 72 controls had not yet reached the menopause or had had an artificial menopause
 $Z=1.9753$ $P<0.05$

HISTORY OF PREVIOUS ILLNESS

History of previous hysterectomy was significantly more frequent for controls than cases (Table V).

TABLE V
HISTORY OF HYSTERECTOMY

Women	Hysterectomy		Total
	Yes	No	
Cases	4 (4.0)	96 (96.0)	100 (100)
Controls	25 (12.5)	175 (87.5)	200 (100)

χ^2 with Yates correction = 4.8248, $df=1$, $0.05>P>0.02$
Percentages are given in parentheses

A significantly greater number of cases ($\chi^2=14.612$, $df=1$, $P<0.005$) gave a history of previous breast trauma. There was no association with thyroid conditions, diabetes mellitus, uterine fibroids, ovarian disease, smoking history, or previous x-ray experience.

MISCELLANEOUS

There was no difference in height between cases and controls ($p=0.61$). The cancer occurred more frequently in the left than in the right breast but the difference was not significant ($p=0.09$).

DISCUSSION

The study of breast cancer in Irish women has produced some unexpected results. The association usually observed between higher socioeconomic status and the development of breast cancer was not present (Stocks, 1955, 1957; Salber *et al.*, 1969; Valaoras *et al.*, 1969; Lowe and MacMahon, 1970; MacMahon *et al.*, 1970b; Yuasa and MacMahon, 1970). However this result was influenced by the method of selection inherent in interviewing patients attending hospital outpatient departments, since the system of medical care which operates in the Republic of Ireland whereby some persons in the higher social groups are treated as private patients and therefore are not accessible to hospital research projects, eliminates to some extent differences in socioeconomic status.

Interesting findings were the absence of significant differences between cases and controls for marital status and age at first pregnancy. In many studies an excess of single women among the cases has been a predominant feature, and in the international study only the data from Slovenia (Ravnihar, MacMahon, and Lindtner, 1971) did not show significant differences in marital status between cases and controls. However it is suggested (MacMahon *et al.*, 1970a) that the fact that in Slovenia 25% of the single women reported having had one or more pregnancies might account for some of the discrepancy between the data for Slovenia and the other centres. In the present study mean age at first pregnancy was 28.2 years for cases and 27.4 years for controls, and only three cases (4.6%) and four controls (3.3%) had their first pregnancies when under 20 years of age. Even more striking was the number of cases 27 (41.6%) and controls 40 (32.5%) who were first pregnant when 30 years or older. In the international study (MacMahon *et al.*, 1970b) more women in Athens and Slovenia than in other centres had their first pregnancies when they were 30 years and older (19.7% of cases and 15.0% of controls respectively) and it was shown that the risk of those first pregnant between the ages of 30 and 34 years approaches that of the nulliparous, and that first pregnancies at 35 years and older actually increase the risk relative to the nulliparous. It is suggested that the demographic characteristic of late first

pregnancies among married women in this study accounts for the unexpected excess of those women among the cases.

Another constant finding in studies of breast cancer epidemiology has been that controls are of higher parity than cases, but in the present study significant differences were not seen. It has been shown, however, that the association of reduced risk of breast cancer with high parity is dependent on the fact that those who have early first pregnancies tend ultimately to have large families, and that pregnancies when over the age of 25 do not reduce the risk (MacMahon *et al.*, 1970b). The result of the present study is interesting as it adds to the evidence that high parity is not *per se* a protective factor. In the breast cancer patients studied 31 (40.8%) had five or more pregnancies but only three (4.6%) had had first pregnancies when under 20 years, so the reduction in risk is minimal in these women in spite of their high parity.

There was a trend for more cases than controls to report age of menarche at 12 years and younger but this was not significant. However, the problem of recall of age of menarche was noticeable at interview in both cases and controls. In contrast age at natural menopause was remembered without difficulty by the majority of women and was significantly later for cases than controls. This is in agreement with data from previous studies (Olsch 1937; Lilienfeld, 1956; MacMahon and Feinleib, 1960; Wynder, Bross, and Hirayama, 1960; Hirayama and Wynder, 1962; Salber *et al.*, 1969; Ravnihar *et al.*, 1971; Trichopoulos, MacMahon, and Cole, 1972). A previous hysterectomy was found significantly more often in controls than in cases. This epidemiological characteristic has also been noted previously (Lane-Clayton, 1926; MacMahon and Feinleib, 1960; Hirayama and Wynder, 1962; Kaplan and Acheson, 1966; Feinleib, 1968; Salber *et al.*, 1969).

Significantly greater numbers of cases gave a history of earlier trauma to the breast. Injuries described included trauma from a sharp edge of furniture, from a garden spade while digging, and from a door handle in a car crash, but it is recognized that breast cancer patients are more likely to recall, and perhaps exaggerate, any trauma to the breast which they may have received.

The demographic characteristics which produced the unusual features of a late start to pregnancy associated with high fertility have undergone change in the Republic of Ireland in recent years. This is because of a drop in emigration resulting in an increase of persons of marriageable age, and an increase of 50% in the marriage rate in 10 years.

During the mid-1960's there was an overall decline in fertility closely associated with age. There was no change in the fertility rate for women of under 22 years, but it fell by 7%, 15%, and 45% respectively in the 22 to 25, 26 to 39, and 40+ age-groups (FitzGerald, 1974). Since 1971 there has been a small but definite decline in the birth rate, a gradually increasing marriage rate, and an earlier age at marriage. What effect this demographic transformation will have on breast cancer epidemiology in the Republic of Ireland can only be surmised, but earlier age of marriage, provided it remains associated with earlier age at first pregnancy, should produce a decrease in parous women relative to non-parous among breast cancer patients, and perhaps also a decrease in breast cancer.

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