BILATERAL BREAST CANCER

INCIDENCE AND SURVIVAL

Kieran McCaul

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Declaration

This work contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text.

I give consent to this copy of my thesis, when deposited in the University Library, being made available in all forms of media, now or hereafter known.

Kieran McCaul

Contents

List of Tables

Table of Figures

Abstract

Introduction

This study re-examined the epidemiology of bilateral breast cancer with regard to the age at diagnosis and histology of the first breast cancer, and examined the effect of bilateral breast cancer on breast cancer survival.

Methods

A cohort of US women with breast cancer was identified using cancer registry data for the period 1973 to 2000 obtained from the Surveillance, Epidemiology, and End Results (SEER) Program. In this cohort, incidence cases of bilateral breast cancer were identified and rates calculated per 1,000 person-years and the effect on survival of a diagnosis of a bilateral breast cancer was determined using time-dependent proportional hazard regression

Results

The overall incidence of bilateral breast cancer was 5.5 per 1,000 person-years and, apart from an elevation in incidence in the first year, was constant over time.

In age-cohorts of young women, age-specific rates of bilateral breast cancer were found to decline as these women aged, approaching the incidence observed in older age cohorts. In older age-cohorts, age-specific rates were comparatively constant until age 75-79 years, after which age-specific rates began to decline regardless of age at first diagnosis.

Differences in the crude incidence of bilateral breast cancer in sub-cohorts of women with lobular carcinoma (6.56 per 1,000 person-years) and infiltrating ductal carcinoma (5.31 per 1,000 person-years) were largely explained by differential incidence in the first year following diagnosis of the first breast cancer.

Diagnosis of bilateral breast cancer increased the risk of breast cancer mortality, independent of the interval between the first and second breast cancer. Stage of both the first and second breast cancers was found to be the most important determinant of risk.

Conclusions

This study found that the pattern of age-specific incidence of bilateral breast cancer was consistent with effects already well established in the literature describing the incidence of first primary breast cancer – pre-menopausal effects in young women and under-ascertainment in older women.

Estimates of the incidence of bilateral breast cancer were subject to bias caused by an elevation in the incidence in the first year following diagnosis of the first breast cancer. This was most likely an effect of increased surveillance. This explained to a large extent, associations between the histology of the first breast cancer and the incidence of bilateral breast cancer observed in earlier studies.

This study challenged the currently accepted view that bilateral breast cancer was a sign of increased susceptibility to breast cancer. Instead it is argued that the constant annual incidence of bilateral breast cancer suggests a final, discrete stage in a multistage carcinogenesis process. It is further argued that the observed incidence of bilateral breast cancer allows us to estimate the incidence of breast cancer in the population

among women reaching this final stage within their lifetime. It is conservatively estimated that by age 75 to 79 years only half the women in the population have reached this final stage.

This implies that in half the population of women, breast cancer either never initiates or progresses so slowly that the final stage of carcinogenesis is not reached within their lifetime.

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