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Vasomotor menopausal symptoms are not associated with incidence of breast cancer in a population-based cohort of mid-aged women

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Abstract ***Background:*** Recently, two case-control studies showed that vasomotor menopausal symptoms (VMS), i.e. hot flushes (HF) and night sweats (NS), are associated with a decreased risk of breast cancer. Until now, however, no prior studies have prospectively examined the association between VMS and breast cancer incidence. We investigated this in a population-based cohort of mid-aged women in Australia.

Methods: We included 11,297 women without a history of breast cancer aged 47–52 years from the Australian Longitudinal Study on Women's Health, surveyed every 3 years from 1998 to 2010. Information regarding first invasive breast cancer events and date of diagnosis was obtained from cancer registries. We determined the association between HF and NS and breast cancer occurrence before the subsequent survey, using time-dependent cox regression analysis, adjusting for time-varying lifestyle factors.

Results: At baseline 33.1% of the women reported experiencing HF and 24.6% reported NS. During a mean follow-up of 13.7 years, 348 cases of breast cancer occurred. VMS were not associated with breast cancer; adjusted hazard ratios were 1.09; 95% confidence interval (CI) 0.87–1.35 for HF and 1.06; 95% CI 0.84–1.33 for NS. No significant interactions were found between each of body mass index, alcohol use, current hormone therapy use, menopausal status and VMS and breast cancer (p-values > 0.05).

Conclusions: We did not find an association between VMS and breast cancer incidence. Research in this area is scarce and additional large prospective population-based studies are required to confirm or refute these findings.

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1. Introduction

Vasomotor menopausal symptoms (VMS) which include hot flushes (HF) and night sweats (NS) are common and occur in up to 80% of women around the time of menopause [1,2]. Besides being known as troublesome and affecting quality of life [3], emerging evidence suggests that VMS are also associated to physical conditions like cardiovascular disease [4–7].

Breast cancer is the most common cancer diagnosed among women and leading cause of cancer deaths [8–10]. It is most prevalent in postmenopausal women and risk factors include family history [11], higher breast density [12] and other factors such as obesity [10], physical inactivity [10], smoking [13] and higher alcohol consumption [14]. Exposure to longer duration of oestrogen, for instance through early menarche, late age at first birth and late menopause [15,16] are also known risk factors, as is hormone replacement therapy (HRT) [17,18]. Given that oestrogens also play a role in the pathogenesis of VMS [19,20], a direct link between VMS and breast cancer is plausible.

So far, two case-control studies reported on a possible association of menopausal symptoms and a decreased breast cancer risk [21,22]. Compared with women who never had symptoms, those who reported ever experiencing symptoms had half of the risk of breast cancer. However, both studies are limited by the fact that data on VMS were obtained after the diagnosis of breast cancer. Until now, no prior studies have prospectively examined the association between VMS and breast cancer incidence. We investigated this in a population-based cohort of mid-aged women in Australia.

2. Materials and Methods

2.1. Population

We included participants from the Australian Longitudinal Study of Women's Health (ALSWH), a national population-based study of women born in 1921–1926, 1946–1951 and 1973–1978. Women were randomly selected from the Medicare Australia database, which covers all citizens and permanent residents of Australia, including refugees and immigrants. Confidentiality restrictions meant that names and contact details of the selected women were not available to the study team until they chose to participate. Hence the recruitment was based entirely on mailed materials sent from the Health Insurance Commission on behalf of the research team. The study was approved by the Human Research Ethics Committees of the Universities of Newcastle and Queensland. Further details of recruitment and response rates have been published elsewhere [23].

The present study focuses on the cohort born in 1946–1951, who were surveyed in 1996 (S1), 1998 (S2), 2001 (S3), 2004 (S4), 2007 (S5) and 2010 (S6). In these analyses, we included those who responded to S1 ($n = 13{,}715$), and who lived in the states of New South Wales (NSW), Queensland (QLD), Victoria (Vic) or Western Australia (WA), giving a total of 11,548 women. Linked cancer registry data were not available for the other states or territories. We excluded 251 women with prevalent breast cancer, based on 1996 self-report and cancer registry data, leaving 11,297 women for this present study.

2.2. Breast cancer

Data on morbidity were obtained from cancer registry data from 1994 till 2008 for NSW, 1982 till 2009 for QLD, from 1982 till 2011 for Vic and from 1982 till 2012 for WA. Invasive fatal and non-fatal breast cancer events were identified using International Statistical Classification of Diseases and Related Health Problems codes (10th revision (ICD-10: C50.0-C50.9). If multiple breast cancer events occurred, the first diagnosis was taken as the end-point. Women were followed from the month of return of S1 (1996) until the date of breast cancer diagnosis, death, or were censored at the 15th of December 2008 (NSW), the 25th of November 2009 (QLD), the 14th of December 2011 (VIC) or the 5th of February 2012 (WA). Information on vital status was available through linkage to the National Death Index and was available until 30th of October 2012.

2.3. Vasomotor menopausal symptoms

At each survey, women reported whether they had experienced symptoms of HF and NS in the past 12 months (never, rarely, sometimes or often). Women were considered to have experienced HF or NS if they reported sometimes or often.

2.4. Socio-demographics

Education level at S1 was categorised into no formal qualifications (not completed year 10), school or leaving certificate (completed up to year 10 or 12), trades and apprentice or higher education. At each survey, women were asked how they manage on their income, which was categorised as always difficult/impossible, sometimes difficult or easy/not bad.

2.5. Lifestyle factors

Lifestyle factors were determined at each survey. Body mass index (BMI) in kg/m^2 was calculated from self-reported height and weight and categorised into