

## The plight of nuns: hazards of nulliparity



Catholic nuns are committed to leading a celibate, spiritual life in a monastery or convent. In 1713, Italian physician Bernadino Ramazzini<sup>1</sup> noted that nuns had an extremely high incidence of that “accursed pest”, breast cancer. Today, the world’s 94790 nuns still pay a terrible price for their chastity because they have a greatly increased risk of breast, ovarian, and uterine cancers: the hazards of their nulliparity.

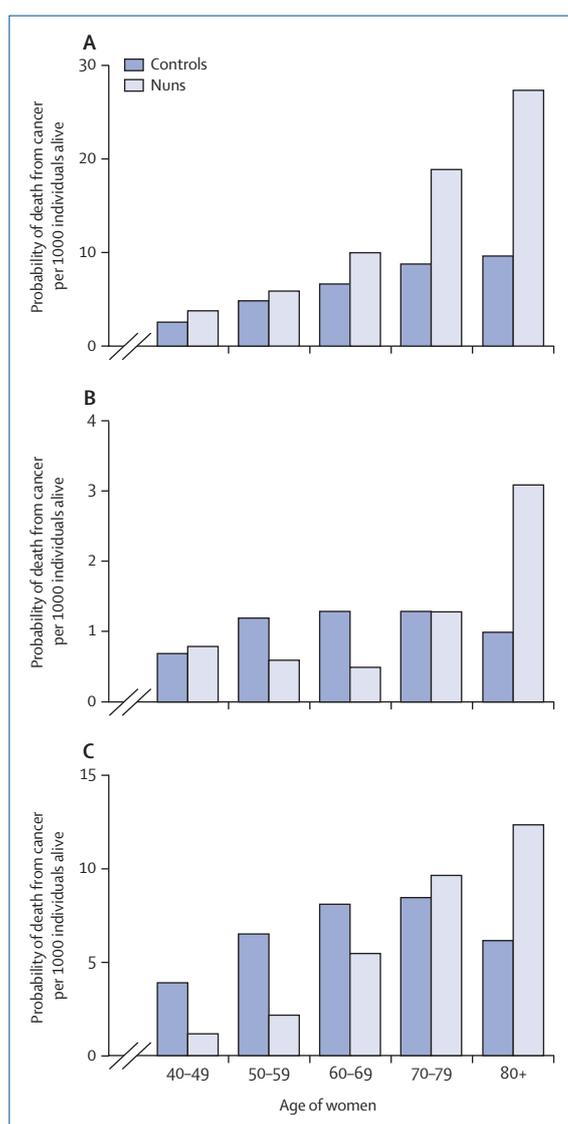
Fraumeni and colleagues<sup>2</sup> compiled data for cancer mortality rates in 31658 Catholic nuns in the USA between 1900 and 1954, and showed that nuns had an increased probability of dying from breast, ovarian, and uterine cancer compared with the general population (figure). MacMahon and colleagues<sup>3</sup> were the first investigators to make a formal link with parity, showing, in 1970, that parous women had a decreased risk of breast cancer compared with nulliparous women. Parous women receive further protection if they have their first child at a young age, bear more children, and if they breastfeed. These reproductive factors are now known also to protect against the risk of ovarian and endometrial cancer.<sup>4</sup>

Nulliparous women have a higher number of ovulatory menstrual cycles than do parous women because of the absence of pregnancy and lactation, and an increased number of cycles affects cancer risk. Epidemiological studies<sup>5,6</sup> of breast cancer have directly linked number of menstrual cycles to cancer risk. Women experiencing menarche before age 12 years had a slightly higher risk of breast cancer than did those who were older than 15 at menarche.<sup>5</sup> Similarly, the risk of breast cancer is increased by 17% for every 5-year delay in menopause.<sup>6</sup> Bilateral oophorectomy before age 40 years led to a 45% reduced risk of breast cancer compared with women with a natural menopause at ages 50–54 years.<sup>5</sup> The increased number of cycles between menarche and menopause also leads to increased risk of ovarian and uterine cancers.<sup>7,8</sup> This finding has been best shown by Eaton and colleagues’ mathematical model,<sup>9</sup> which used age at menarche, first pregnancy and menopause, and use of oral contraceptives to predict incidence of a woman’s reproductive cancer. Findings from this model showed that the lifetime risk of reproductive cancers in modern American women was about 128 (breast), 21 (ovarian), and 287 (uterine) times that in women of

similar age living in late Palaeolithic times. However, it is not known how to improve the health of breasts that do not need to lactate, ovaries that need not ovulate, and a uterus that does not need to menstruate.

Two large epidemiological studies<sup>10,11</sup> of the health effects of contraceptive pills have shown that the oral contraceptive pill significantly decreases overall mortality rate, does not increase breast cancer risk, and significantly reduces risk of both ovarian and uterine cancers. The

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**Figure: Incidence of reproductive cancers in nuns**

Cancer mortality in 31658 nuns from 41 Catholic religious orders in the USA, 1900–54.<sup>2</sup> Nuns have an increased probability of death from breast cancer (A), ovarian cancer (B), and uterine cancer (C) compared with the female population, especially at older ages.

overall mortality rate in ever users of the oral contraceptive pill was reduced by 12% compared with never users. In both studies, the adjusted relative risks (RR) of ovarian (RR 0.53 [95% CI 0.38–0.72]<sup>10</sup> and 0.4 [0.3–0.6]<sup>11</sup>) and endometrial cancers (0.43 [0.21–0.88] and 0.3 [0.1–0.8]) were reduced by 50–60% compared with never users, and the protection persisted for 20 years, which shows long-term benefit. The oral contraceptive did not reduce the RR of breast cancer (0.9 [0.74–1.08] and 1.0 [0.8–1.2]).

When the oestrogen-gestagen pill was first licensed for use in 1960, it was taken for 21 days, followed by 7 days of an inactive placebo that induced menstruation as a result of the hormone withdrawal. A clinical trial<sup>12</sup> in Edinburgh, UK, of a pill regimen every 3 months that resulted in only four menstrual periods a year was extremely popular with women. 97 (91%) of 107 women who completed the 1-year trial of the tricycle pill regimen refused to revert to monthly menstruation at the end of the trial. Contraceptive pills containing a combination of oestrogen and levonorgestrel are now available in the USA and UK to prevent all menstrual periods. Time and further research will tell whether continuous suppression of all menstrual cycles will increase the protection against breast, ovarian, and uterine cancers. The possibility of health risks, such as venous thromboembolism associated with use of the combined pill, should not be forgotten, and women's medical history should always be considered.

The Catholic Church condemns all forms of contraception except abstinence, as outlined by Pope Paul VI in *Humanae Vitae* in 1968.<sup>13</sup> Although *Humanae Vitae* never mentions nuns, they should be free to use the contraceptive pill to protect against the hazards of nulliparity since the document states that “the Church in no way regards as unlawful therapeutic means

considered necessary to cure organic diseases, even though they also have a contraceptive effect”. If the Catholic Church could make the oral contraceptive pill freely available to all its nuns, it would reduce the risk of those accursed pests, cancer of the ovary and uterus, and give nuns' plight the recognition it deserves.

\*Kara Britt, Roger Short

Prostate and Breast Cancer Research Program, Department of Anatomy and Developmental Biology, Monash University, VIC 3800, Australia (KB); and Faculty of Medicine, Dentistry and Health Sciences, University of Melbourne, VIC, Australia (RS) kara.britt@monash.edu

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