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**Breast Cancer in Jordan – An Epidemiological Study**

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**Background:** The epidemiology of breast cancer has been extensively studied in developed countries; however, epidemiological data is scarce in the Middle East. We present an epidemiological analysis of breast cancer in the Jordan in an attempt to aid continuously evolving strategies for cancer surveillance and control. Furthermore, we highlight the temporal changes of cancer care delivery over the period of this study.

**Material and Methods:** Data from the national cancer registry addressing the period from January 1996 to December 2008 were reviewed. The Jordanian national cancer registry was established in 1996 and utilizes a passive and active capture system. Tumor stage was classified into local, regional, distant or unknown. Crude incidence rates are expressed per 100,000.

**Results:** Over the study years, 7,813 breast cancer cases were registered. The crude incidence rate of breast cancer ranged from 20 to 29.9 with 28.2% of cases occurring in 40–49, 26.4% of cases occurring in 50–59 and 18% of cases occurring in the 60–69 age groups. The median age was 51 (range, 16–100 years). Ductal carcinoma was found in 7,018 (89.8%), lobular adenocarcinoma in 478 (6.1%) and sarcoma in 139 (1.8%) patients. Overall, 1,412 (17.4%) cases harbored local, 1,504 (19.3%) harbored regional, 1,572 (18.3%) harbored metastatic disease while in 3,306 patients (45.2%) staging data was missing. Over the years; 2,361 (30.2%) cases were treated at academic/ comprehensive cancer centers while 4,760 (60.9%) cases were treated at a primary care/ community and/or private healthcare setting. In 692 (8.9%) patients, the location of healthcare delivery was unknown 1,652 (21.1%). We observed a trend towards referring more patients to academic/ comprehensive cancer centers over the years of the study; only 29 (6.5%) of a total of 449 patients presenting in 1996 were treated at such institutions as opposed to 406 (47.5%) of a total of 855 patients in 2008.

**Conclusions:** This study represents the first comprehensive assessment of the epidemiological features of breast cancer in Jordan basing a framework for enhancing strategic health plans regarding cancer surveillance and control in Jordan and the Middle East.

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**Age at Diagnosis in Relation to Survival Following Breast Cancer**

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**Background:** Age is an important risk factor for breast cancer, but it has also been suggested that age at diagnosis is related to breast cancer survival. The present study evaluates age at diagnosis as a prognostic factor for breast cancer, and examines if stage at diagnosis and/or diagnostic period can affect this potential association.

**Materials and Methods:** All 4453 women diagnosed with breast cancer in Malmö, Sweden between 1961 and 1991 were followed for ten years with regards to breast cancer-specific mortality (BCSM) in different age categories. Corresponding relative risks (RR), with 95% confidence intervals, were obtained using Cox's proportional hazards analysis. All analyses were adjusted for potential confounders and stratified for axillary lymph node involvement (ALNI) and diagnostic period.

**Results:** As compared to women aged 40–49, age <40 (RR = 1.34:0.94–1.92) and age ≥80 (1.93:1.50–2.48) were associated with a higher 5-year BCSM rate. Age <40 (1.40:1.04–1.88) and age ≥80 (1.80:1.45–2.25) were also associated with a higher 10-year mortality rate. When adjusted for potential confounders including stage at diagnosis, the associations only remained for women ≥80. In the analyses stratified on ALNI, ALNI negative women <40 had a statistically significant higher 5-year mortality rate (2.65:1.23–5.70). In the analyses stratified on diagnostic period, the positive association between age <40 and age ≥80 and high BCSM rate remained, with statistically significant results for women ≥80 years in all periods.

**Conclusions:** Women <40 years with ALNI negative breast cancer and women ≥80 years have a high breast cancer specific mortality as compared to women aged 40–49. For women ≥80 this association is independent of stage and diagnostic period.

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**Poor Breast Cancer Screening Attendance in an Asian Population – a Survey to Elucidate Underlying Reasons**

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**Background:** Breast cancer is the most common cancer among Singaporean women, and a subsidized national mammographic screening (MS) program exists for early detection. Nonetheless, participation rates remain low. Understanding the knowledge gaps and barriers towards screening and breast self-examination (BSE) and comparing it against the practices of at-risk populations will help physicians modify health promotion priorities.

**Material and Methods:** A face-to-face questionnaire was administered to 367 female patient and visitors above 40 years of age at four primary healthcare institutions. A response rate of 72.6% was achieved based on random convenience sampling. Responders were assessed on their knowledge and perception of MS and BSE.

**Results:** The demographics of responders obtained mirrored that of Singapore's national demographics. Although 85.0% of responders perceived MS as important, only 49.3% participate in regular mammograms. Responders who perform BSE are more likely to go for regular MS ( $p < 0.001$ ), as are responders who were assessed to have good knowledge ( $p < 0.001$ ). Despite having good knowledge, 37.7% of responders still did not go for regular mammograms. They cited reasons such as lack of time (13.1%), perception that they do not have any breast-related illness (12.6%) and fear of pain (11.2%).

However, 56.9% of responders misunderstood screening as seeking medical attention only when symptomatic. Common barriers towards screening included fear of pain and embarrassment, fear of radiation causing cancer, and perceived inadequate facilities. They would change their minds if they became symptomatic or if their doctors, family or friends encouraged them (33.0%). Cost-related issues were cited by 14.4% of responders.

**Conclusion:** Health promotion priorities should be aimed at clarifying misconceptions and addressing barriers such as fear and embarrassment. In particular, it should be emphasized that screening should be performed even when asymptomatic. More awareness should also be raised towards available subsidies and facilities.

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**Identifying the Concerns and Fears Towards Breast Cancer Screening Among Younger Asian Women**

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**Background:** Breast cancer is the most common cancer among Singaporean women. Health promotion campaigns are often targeted at those above 40 years old who are eligible for the national mammographic screening (MS) programme. We aim to study the knowledge, attitudes and perceptions of MS in those below 40 years old, which has otherwise not been adequately studied.

**Material and Methods:** A face-to-face questionnaire was administered to 148 female patient and visitors from 21 to 39 years old of age at four primary healthcare institutions. A response rate of 72.6% was achieved based on random convenience sampling. Responders were assessed based on their understanding of MS and their intention to attend MS in future.

**Results:** The demographic of responders obtained mirrored that of Singapore's national demographics. The mean age surveyed was 30. Most responders (70.9%) were aware that breast cancer is the most common cancer among Singaporean women, and almost all (95.9%) agreed that early detection and treatment through MS confers better outcome.

Two thirds of responders thought that screening need not be performed unless symptomatic. Common deterrents include fear of radiation causing cancer, fear of distortion of appearance of breast, cost issues and fears of pain and embarrassment. While half of the responders have heard of the national screening program, most had a superficial understanding of the screening centers, cost and eligibility criteria.

Responders who had good knowledge of MS expressed a higher intention to go for MS than those with poorer knowledge ( $p = 0.005$ ).

**Conclusion:** Although there is a healthy perception towards the importance of MS in detecting early breast cancer, many young women had severe misconceptions towards it. Health promotion initiatives should be aimed at clarifying misconceptions and addressing barriers, as this may improve pick-up rate when these women become eligible for screening.