

## Breast Cancer in Southeast Asia: Comparison of Presentation and Outcome Between a Middle Income and a High Income Country\*

Socioeconomic differences in Southeast Asia have caused distinctive differences in the development of healthcare systems in the various countries in the region. The study described here compares breast cancer presentation and outcomes for patients in a middle income country (Malaysia) and a high income country (Singapore), in the region.

Data were collected from patients diagnosed with breast cancer between 1993 to 2007 at the National University Hospital in Singapore (2,141 patients) and the University of Malaya Medical Centre (3,320 patients). These patients were monitored and their mortality data was obtained from medical records or the patients' next of kin.

The study examined the patients' ages, ethnicities, and oestrogen receptor and progesterone receptor status, stage, cell differentiation, tumour size, nodal status and regional nodes. Treatment variables such as the type of surgery, radiotherapy, chemotherapy, hormone therapy and neoadjuvant chemotherapy were also investigated. Logistic regression analysis was used for demographics, tumour characteristics and treatment received, while the median age at diagnosis and tumour size were compared with the Mann-Whitney U test. The proportion of patients receiving treatment between the two centres was compared using the chi-square test and the overall survival rates between countries were compared using the Kaplan-Meier analysis and the log rank test, with Coz regression analysis used to estimate the adjusted relative risk of all causes or mortality for patients treated in Malaysia as compared to those treated in Singapore.

Results revealed that with a median follow-up of 5.1 years (Malaysian) and 6.1 years (Singaporean), the Malaysian patients were less likely to be diagnosed with in situ breast cancer and more likely to be diagnosed with advanced stage breast cancer when compared to the Singaporean patients. The tumour sizes of the Malaysian patients were also larger. In addition, Malaysian patients were more likely not to undergo surgery for stages I-III of the disease; were less likely to receive radiotherapy for invasive, non-metastatic disease; and just as likely to receive chemotherapy and hormone replacement therapy for oestrogen receptor negative lymph node positive disease and oestrogen receptor positive disease.

The five-year overall survival rate was substantially lower in Malaysian patients compared to Singaporean patients even though the survival rates for both countries improved over time, with the Malaysian patients having greater improvement. Univariate analysis showed that Malaysian patients had a 72% increased risk of death as compared to Singaporean patients. The risk only decreased by 5% when it was adjusted for tumour characteristics and treatment method.

The study concluded that the survival rate was much lower in Malaysia than in Singapore despite there not being many differences in the way of presentation (except for stage and tumour size) and treatment in breast cancer patients. This could be due to factors like life expectancy, lower socio-economic status, low access to high quality healthcare, poor treatment compliance, and poor lifestyle after diagnosis. The type of treatment received was not the reason for the survival rate in this study because there was not much difference between the adjusted and unadjusted hazardous ratios.

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\* Based on Saxena, N., Hartman, M., Bhoo-Pathy, N. et al. *World J Surg* (2012) 36: 2838. doi:10.1007/s00268-012-1746-2