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Treatment patterns for cancer in Western Australia: does being Indigenous make a difference?

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There is little documented research examining disparities in cancer services between the Indigenous and non-Indigenous populations of Australia. Surgical procedures for cancer have received almost no attention, although differences have been seen between Indigenous patients and other patients in utilisation of hospital procedures, including those for all neoplasms combined. Inequalities in access to cardiovascular healthcare have also been reported. Furthermore, living in a rural area in Australia has been shown to affect cancer treatment patterns and being treated in a rural hospital has been shown to worsen patient outcomes. The finding of a lower total procedure rate in the Indigenous population is consistent with these findings.

Our exploratory study aimed to examine possible disparities between the Indigenous and non-Indigenous populations of Western Australia (WA) in the uptake of cancer surgery for three common cancers (breast, prostate and lung), using administrative data collected routinely over 20 years.

METHODS

Data sources and patients

The WA Record Linkage Project was used to extract all hospital morbidity, cancer registrations and death records for all residents of WA who:

• had a mention in any record of cancer of the breast (codes, ICD-9 174.0 or ICD-10 C50), prostate (ICD-9 185 or ICD-10 C61) or lung (ICD-9 162 or ICD-10 C33); or,
• if there was no cancer registration, had a hospital record with the cancer identified together with an associated procedure.

Data extraction

The Record Linkage Project contains data for each patient for each hospital admission. The first record that mentioned the cancer of the breast (1982–2000) or cancer of the lung or prostate (1982–2001).

Main outcome measures:
The likelihoods of receiving breast-conserving surgery or mastectomy for breast cancer, lung surgery for lung cancer, or radical or non-radical prostatectomy for prostate cancer were compared between the Indigenous and non-Indigenous populations using adjusted logistic regression analyses.

Results:
Indigenous people were less likely to receive surgery for their lung cancer (odds ratio [OR], 0.64; 95% CI, 0.41–0.98). Indigenous men were as likely as non-Indigenous men to receive non-radical prostatectomy (OR, 0.69; 95% CI, 0.40–1.17); only one Indigenous man out of 64 received radical prostatectomy. Indigenous women were as likely as non-Indigenous women to undergo breast-conserving surgery (OR, 0.86; 95% CI, 0.60–1.21).

Conclusions:
These results indicate a different pattern of surgical care for Indigenous patients in relation to lung and prostate, but not breast, cancer. Reasons for these disparities, such as treatment choice and barriers to care, require further investigation.

ABSTRACT

Objective: To examine whether hospital patients with cancer who were identified as Indigenous were as likely to receive surgery for the cancer as non-Indigenous patients. Design, setting and patients: Epidemiological survey of all Western Australian (WA) patients who had a cancer registration in the state-based WA Record Linkage Project that mentioned cancer of the breast (1982–2000) or cancer of the lung or prostate (1982–2001).

Main outcome measures: The likelihoods of receiving breast-conserving surgery or mastectomy for breast cancer, lung surgery for lung cancer, or radical or non-radical prostatectomy for prostate cancer were compared between the Indigenous and non-Indigenous populations using adjusted logistic regression analyses.

Results: Indigenous people were less likely to receive surgery for their lung cancer (odds ratio [OR], 0.64; 95% CI, 0.41–0.98). Indigenous men were as likely as non-Indigenous men to receive non-radical prostatectomy (OR, 0.69; 95% CI, 0.40–1.17); only one Indigenous man out of 64 received radical prostatectomy. Indigenous women were as likely as non-Indigenous women to undergo breast-conserving surgery (OR, 0.86; 95% CI, 0.60–1.21).

Conclusions: These results indicate a different pattern of surgical care for Indigenous patients in relation to lung and prostate, but not breast, cancer. Reasons for these disparities, such as treatment choice and barriers to care, require further investigation.

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Indices of disadvantage. The Index of Relative Socioeconomic Disadvantage (IRSD)\(^{10}\) and the Accessibility/Remoteness Index of Australia (ARIA)\(^{11}\) for the place of residence were added to the record based on the Australian Bureau of Statistics census collection districts (where unavailable, the postcode was used). The hospital of the index admission was categorised as public or private and as metropolitan or rural. The payment classification of the patient at the index admission was recoded as public or private.

Definitions of surgery. Lung cancer surgery was defined as one or more of pneumonectomy, lobectomy, segmentectomy, wedge resection or excision/resection of the bronchus or endotrachea. Prostate cancer surgery was defined as either radical or non-radical prostatectomy (including closed, transurethral, or open). For breast cancer, only women who underwent mastectomy or breast-conserving surgery were included, as the principal aim was to examine differences in patterns of surgical treatment rather than use of surgery per se. There were no Indigenous non-surgery breast cancer cases.

Statistical analysis

Univariate analysis was carried out, followed by crude and adjusted logistic regression analysis of the likelihood of receiving surgery for lung and prostate cancer, or breast-conserving surgery for breast cancer. The adjusted analyses used the demographic, comorbidity and disadvantage indices (Box 1). For age, the Box–Tidwell term (age × ln[age]) was used to provide a better fit of the model for adjustment purposes. The data were analysed using SPSS for Windows (Version 10.0.7.)\(^{12}\) and Stata 8.\(^{13}\)

The study was approved by the Human Research Ethics Committee of the University of Western Australia.

RESULTS

The Indigenous population accounted for 2% of lung cancer cases. The Indigenous patients were younger and more likely to be female than the non-Indigenous patients (Box 1). Among the lung cancer patients who received surgical intervention, age and sex distribution were similar in the Indigenous and non-Indigenous groups. There was a tendency for Indigenous cases to not receive surgery, although this only reached significance with the longer time period (1982–2001) (Box 2).

Very few Indigenous men were recorded as having prostate cancer. The mean age of the Indigenous and non-Indigenous groups was similar. A much smaller proportion of Indigenous patients received radical or non-radical prostatectomy (Box 1). As only one Indigenous person received a radical prostatectomy, logistic regression was not performed. The likelihood of receiving non-radical prostatectomy was lower for Indigenous patients than for non-Indigenous patients in the demographically adjusted model but not in the fully adjusted model (Box 2).

Among women with breast cancer there was no difference between Indigenous and non-Indigenous groups in the proportion who received breast-conserving surgery (Box 1). Likewise, the ages of the groups were similar. Logistic regression showed that Indigenous women had similar treatment patterns to non-Indigenous women (Box 2).

DISCUSSION

In general, the Indigenous population with lung or prostate cancer were less likely to receive a surgical procedure for their cancer than the non-Indigenous population. However, Indigenous women with breast cancer had a pattern of surgery similar to that of non-Indigenous women.

Age-standardised cancer incidence rates have tended to be lower in the Indigenous population than in the non-Indigenous population.\(^{14}\) In part, this may be attributable to known difficulties in identifying all Indigenous people in the hospital, cancer and death registries,\(^{15}\) which would result in the true effect of being Indigenous being underestimated. Furthermore, poor life expectancy for Indigenous people may mask cancers that are latent at the time of early death. The small numbers of diagnosed and identified cases limit the potential of the statistical analysis to illuminate treatment patterns and outcomes in the Indigenous population.

There is some evidence that Indigenous people with cancer in Australia generally have higher case fatality rates.\(^{16}\) This may be due to a higher relative incidence of cancers with high fatality, particularly lung cancer,\(^{14,17}\) later diagnosis or suboptimal treatment patterns. We found no difference in breast cancer treatment patterns, whereas there were differences in lung and prostate cancer treatment patterns.

Sociocultural and economic factors may influence treatment patterns and outcomes,
as has been found with breast cancer. An Indigenous person may not have the financial resources, even with assistance programs, to travel for surgery and adjuvant treatment or to pay for medications, this may be compounded by a low rate of private health insurance. Cultural and religious barriers may also exist, such as sex of the healthcare provider, religious denomination of the hospital or a preference for traditional healing practices. There may also be concerns about how the immediate and extended family will cope with the illness and treatment, especially in areas lacking culturally sensitive aftercare services. Importantly, there may be concerns that treatment is ineffective and not worthwhile, especially for cancers with high case-fatality rates, such as lung cancer.

From a healthcare system perspective, plausible barriers exist at all stages of care. There are few Indigenous cancer specialists, and non-Indigenous specialists may have difficulty communicating effectively with patients and their families, potentially leading to paternalistic care and reduced compliance with treatment. Coordinated care between cancer centres, local hospitals and primary care services is essential, but service gaps are commonly reported. From a clinical perspective, the low rates of surgical intervention for lung cancer in this study may indicate that the cancers are more advanced and less amenable to treatment in the Indigenous population, or, alternatively, there may be comorbidity or other valid reasons why patients or surgeons have decided that surgical treatment is not the preferred option. Nevertheless, the potential for systematic unintentional treatment disparities remains.

A number of policy options are available, but the primary concern must be to reduce social and health inequities for the Indigenous population. The results of this study suggest four possible policies. Firstly, research in the field to determine the reasons for treatment choice and to ensure that barriers to early treatment are minimised. A second policy step is to engage the Indigenous communities, and together find appropriate strategies. Thirdly, administrative datasets have proved useful in profiling morbidity and mortality patterns in the non-Indigenous population, but their use will remain limited in the Indigenous population unless sufficient cases are available for analysis. This could be achieved by better identification of the Indigenous population in the datasets and interstate cooperation to merge de-identified data. Finally, Indigenous issues must be embedded in cancer control strategy plans, and they must be implemented.

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**COMPETING INTERESTS**

None identified.

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