Canadian Journal of Cardiology ■ (2013) 1–8

Clinical Research

Incidence, Secular Trends, and Outcomes of Cardiac Surgery in Aboriginal Peoples

Manish M. Sood, MD,[a,b] Navdeep Tangri, MD, PhD,[a,c] Paul Komenda, MD, MHA,[a,c] Claudio Rigatto, MD, MSc,[a,c] Suhail Khojah, MD,[a] Brett Hiebert, MSc,[b,d] Alan Menkis, MD,[b,d,e] James Tam, MD,[b,d] and Rakesh C. Arora, MD;[b,d,e] on behalf of the Cardiovascular Health Research in Manitoba (CHaRM) Investigator Group

[a] *Section of Nephrology, University of Manitoba, Winnipeg, Manitoba, Canada*

[b] *St Boniface Hospital, Winnipeg, Manitoba, Canada*

[c] *Seven Oaks Hospital, Winnipeg, Manitoba, Canada*

[d] *Section of Cardiology, University of Manitoba, Winnipeg, Manitoba, Canada*

[e] *Section of Cardiac Surgery, University of Manitoba, Winnipeg, Manitoba, Canada*

ABSTRACT

Background: Canada's Aboriginal people experience a disproportionate burden of comorbid illnesses predisposing them to higher rates of atherosclerotic disease. We set out to investigate secular rates of cardiovascular surgery (CVSx) and postsurgical outcomes in Aboriginals compared with non-Aboriginals.

Methods: All patients undergoing CVSx in Manitoba, Canada from 1995-2007 (N =12,170 [Aboriginal, 574, 4.7%; non-Aboriginal, 11,596, 95.3%]) were included in our study cohort. Race was self-identified. Age- and sex-adjusted incidence were determined using 2001 and 2006 census data. Multivariable logistic regression models were constructed to determine the association between race and the outcomes of death, infections, and a composite of adverse events.

Results: CVSx rates were significantly lower in Aboriginals compared with non-Aboriginals (all CVSx, 63.6 vs 97.7 per 10,000 population; coronary artery bypass grafting only, 46.2 vs 71.9 per 10,000 population, respectively). The lower CVSx rates were most pronounced among Aboriginals residing in urban areas (21.0 vs 78.0 per 10,000). Postoperatively, Aboriginals experienced significantly higher odds of

RÉSUMÉ

Introduction : Les Autochtones portent un fardeau disproportionné d'affections comorbides les prédisposant à des taux plus élevés de maladies athérosclérotiques. Nous entreprenons d'examiner les taux séculaires des chirurgies cardiovasculaires (CCV) et les résultats postchirurgicaux des Autochtones par rapport aux non-Autochtones.

Méthodes : Tous les patients ayant subi une CCV au Manitoba, au Canada, de 1995 à 2007 (N = 12 170 [Autochtones, 574, 4,7 %; non-Autochtones, 11 596, 95,3 %]) ont été inclus dans notre étude de cohorte. La race a été autodéclarée. L'incidence ajustée selon l'âge et le sexe a été déterminée en utilisant les données des recensements de 2001 et de 2006. Les modèles de régression logistique multivariée ont été élaborés pour déterminer le lien entre la race et l'évolution des décès, des infections et des divers événements indésirables.

Résultats : Les taux de CCV ont été significativement plus bas chez les Autochtones comparativement aux non-Autochtones (toutes les CCV, de 63,6 *vs* 97,7 par population de 10 000 individus; le pontage aortocoronarien seul, de 46,2 *vs* 71,9 par population de 10 000 individus, respectivement). Les taux de CCV plus bas ont été plus marqués chez

There are more than 1 million individuals self-identified as Aboriginal in Canada.[1] Aboriginal peoples carry a high burden of cardiovascular disease, attributed largely to a higher prevalence of traditional cardiovascular risk factors, and it is the leading cause of death in this population.[2-5] Barriers to disease prevention and treatment in the Aboriginal population exist and include geographic isolation, lower socioeconomic status, and potential varying beliefs regarding the health care system.[1]

Cardiovascular surgery (CVSx) is known to offer comparable, if not superior, revascularization outcomes for patients with multivessel disease and diabetes.[6] Racial disparities in incidence and outcomes of invasive cardiac procedures have been well described.[7-15] In Canada, there are limited and indirect data regarding Aboriginal access to interventional cardiac services.[16] The primary objective of this study was to explore whether disparities exist in the provision and outcomes of CVSx in Canada's Aboriginal peoples.

Received for publication April 29, 2013. Accepted June 10, 2013.

Corresponding author: Dr Manish M. Sood, 409 Tache Avenue, Winnipeg, Manitoba, Canada R2H2A6. Tel.: +1-204 235 3905; fax: +1-204 233 2770.

E-mail: Msood99@gmail.com

See page xxx for disclosure information.

0828-282X/$ - see front matter © 2013 Canadian Cardiovascular Society. Published by Elsevier Inc. All rights reserved.
http://dx.doi.org/10.1016/j.cjca.2013.06.003

infections (odds ratio [OR], 1.63; 95% confidence interval [CI], 1.13-2.34; $P = 0.008$), in particular pneumonia (OR, 2.24; 95% CI, 1.58-3.19; $P < 0.0001$). There was no increase in risk of death after surgery (OR, 1.15; 95% CI, 0.63-2.08; $P = 0.6$) or the composite outcome (OR, 1.0; 95% CI, 0.66-1.52; $P = 1.0$) compared with non-Aboriginals.

Conclusions: Aboriginal peoples, particularly in the urban setting, are considerably less likely to undergo CVSx. When they do, they have postoperative mortality similar to that of non-Aboriginals. Our findings suggest an urban racial disparity in access to CVSx.

les Autochtones habitant en milieu urbain (21,0 *vs* 78,0 par 10 000 individus). Après la chirurgie, les Autochtones ont montré des risques plus élevés d'infections (ratio d'incidence approché [RIA], 1,63; intervalle de confiance [IC] à 95 %, 1,13-2,34; $P = 0,008$), en particulier, de pneumonie (RIA, 2,24; IC à 95 %, 1,58-3,19; $P < 0,0001$). Il n'y a pas eu d'augmentation du risque de décès après la chirurgie (RIA, 1,15; IC à 95 %, 0,63-2,08; $P = 0,6$) ou des critères de jugements combinés (RIA, 1,0; IC à 95 %, 0,66-1,52; $P = 1,0$) comparativement aux non-Autochtones.

Conclusions : Les Autochtones, particulièrement ceux habitant en milieu urbain, sont considérablement moins susceptibles de subir une CCV. Lorsqu'ils en subissent une, ils ont une mortalité similaire à celle des non-Autochtones. Nos conclusions montrent une disparité raciale en milieu urbain en ce qui concerne l'accès à la CCV.

Methods

Study population

In this retrospective study, the analytic cohort included all patients (> 15 years of age) who underwent CVSx from 1995-2007 in the province of Manitoba (population, 1.2 million). All adult cases of cardiac surgery in Manitoba were captured. This study was approved by the Research Ethics Board of the University of Manitoba, the Hospital Ethics Board at St. Boniface Hospital in Winnipeg, Manitoba, and the Assembly of Manitoba Chiefs. For additional information regarding data collection methods, cohort definitions, patient outcomes, and statistical analyses, please see Supplemental Text.

Cohort definitions

The database included all patients undergoing any type of CVSx, including coronary artery bypass grafting (CABG) or valvular surgery. Information on race in the database was recorded by health care providers based on patient self-reporting. The term "Aboriginal" denotes individuals who self-reported as First Nations, Métis, or Inuit. Distance to the centre was defined as the spherical distance in kilometres from a patient's referral centre to a patient's residence based on postal codes.[17]

Patient outcomes

The primary outcome examined was in-hospital mortality. Secondary outcomes examined included a composite outcome of adverse events (death, acute coronary syndrome [ACS], stroke, dialysis), all infections, and pneumonia. For outcome definitions, please see Supplemental Text. Infections and pneumonia were chosen as outcomes of interest based on pre-existing literature of increased risk in Aboriginals.[18,19]

Statistical analyses

Annual rates of cardiac surgery per 1000 population per year were calculated separately for the Aboriginal and non-Aboriginal populations. A patient's postal code was used to determine geographic location, and the division of residing in the North or South of the province was defined by the Manitoba Department of Northern Affairs.[20]

To examine the association between race and outcomes, binary logistic regression models were constructed for each outcome of interest. Models were sequentially adjusted. Odds ratio (OR) with a 95% confidence interval (CI) was generated for the binary variable of Aboriginal or non-Aboriginal for each outcome of interest.

Results

Comparison of Aboriginal and non-Aboriginal patient characteristics

Over the study period, 12,793 patients underwent CVSx. From this cohort 623 (4.9%) were missing data and excluded from the analysis, leaving 12,170 patients (574 Aboriginal; 11,596 non-Aboriginal) in the study cohort used to determine the baseline characteristics and postoperative outcomes. A further 423 patients (3.5%) were missing postal code information and 623 (5.1%) resided outside of Manitoba and were excluded from the regional analysis. There was no significant difference in missing cases between Aboriginals and non-Aboriginals. Aboriginals on average were younger (54.4 vs 65.3 years, $P < 0.0001$), with more diabetes (50% vs 24.9%), chronic kidney disease (6.7% vs 3.3%), preoperative dialysis (3.3% vs 0.7%), pre-existing stroke (7.9% vs 5.9%) and congestive heart failure (CHF) (23.9% vs 15.8%) (Table 1). Non-Aboriginals were more likely to have hyperlipidemia, family history of cardiac disease, history of previous percutaneous cardiac intervention, and active chest pain. Surgically, Aboriginals were less likely to undergo CABG (67.4% vs 73.6%) and more likely to undergo valve replacement (19.9% vs 12.1%) or emergent procedures (7.7% vs 5%). Aboriginals were less likely to be receiving appropriate cardiac medications (angiotensin-converting enzyme inhibitors, β-blockers, and acetylsalicylic acid) at the time of surgery and more likely to reside in a location remote from the cardiac centre (315.6 vs 10.9 km; $P < 0.0001$).

Population-level rates of cardiac surgery

The age- and sex-adjusted rates of cardiac surgery were considerably lower for Aboriginals than for non-Aboriginals (0.76 vs 1.15 per 1000 population per year; $P < 0.001$) (Figs. 1 and 2). This disparity persisted when the analysis was limited to isolated CABG procedures (0.56 vs 0.85 per 1000 population per year; $P < 0.001$) and was consistent over the

Download English Version:

https://daneshyari.com/en/article/5877212

Download Persian Version:

https://daneshyari.com/article/5877212

Daneshyari.com