International Defensive Medicine in Neurosurgery: Comparison of Canada, South Africa, and the United States

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■ OBJECTIVE: **Perception of medicolegal risk has been shown to influence defensive medicine behaviors. Canada, South Africa, and the United States have 3 vastly different health care and medicolegal systems. There has been no previous study comparing defensive medicine practices internationally.**

■ METHODS: **An online survey was sent to 3672 neurosurgeons across Canada, South Africa, and the United States. The survey included questions on the following domains: surgeon demographics, patient characteristics, physician practice type, surgeon liability profile, defensive behavior—including questions on the frequency of ordering additional imaging, laboratory tests, and consults—and perception of the liability environment. Responses were analyzed, and multivariate logistic regression was used to examine the correlation of medicolegal risk environment and defensive behavior.**

■ RESULTS: **The response rate was 30.3% in the United States (n = 1014), 36.5% in Canada (n = 62), and 41.8% in South Africa (n = 66). Canadian neurosurgeons reported an average annual malpractice premium of $19,110 (standard deviation [SD] = $11,516), compared with $16,262 (SD = $7078) for South African respondents, $75,857 (SD = $50,775) for neurosurgeons from low-risk U.S. states, and $128,181 (SD = $79,355) for those from high-risk U.S. states. Neurosurgeons from South Africa were 2.8 times more likely to engage in defensive behaviors compared with Canadian neurosurgeons, while neurosurgeons from low-risk U.S. states were 2.6 times more likely. Neurosurgeons from high-risk U.S. states were 4.5 times more likely to practice defensively compared with Canadian neurosurgeons.**

■ CONCLUSIONS: **Neurosurgeons from the United States and South Africa are more likely to practice defensively than neurosurgeons from Canada. Perception of medicolegal risk is correlated with reported neurosurgical defensive medicine within these countries.**

INTRODUCTION

Defensive medicine—the practice of prescribing unnecessary medical care or avoiding high-risk situations out of a fear of litigation—is increasingly being recognized as a major medicolegal issue.[1] There are two primary types of defensive medicine. Positive defensive medicine consists of providing additional, unnecessary medical treatments, which could potentially contribute to rising health care costs and expose patients to unnecessary morbidity. Negative defensive behavior entails avoiding high-risk procedures and patients for fear of being sued, which could negatively impact clinical decision making. In high-risk fields such as neurosurgery, defensive medicine behaviors are prevalent.[2,3] In the United States, a previous report by the American College of Emergency Physicians created risk profiles for each state on the basis of their medicolegal environment—states were categorized from the best liability landscape (a grade of A) to the worst (a grade of F).[4] A recent study found that for each grade change on this scale, neurosurgeons were 1.5 times more likely to engage in defensive behavior.[5] The medicolegal environment in the United States has been widely analyzed in the literature, both neurosurgical

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- South Africa

Abbreviations and Acronyms
CMPA: Canadian Medical Protective Association

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and otherwise. In general, concerns have arisen regarding the impact of private insurance on rapidly increasing health care costs, which have been attributed in part to the practice of defensive medicine, and the potential impact of tort reform on lawsuits, whether legitimate or frivolous.

No studies have compared defensive medicine on an international level, despite a large variability in medicolegal environments among these countries. Canada, for example, has a single-payer health care system that is largely publicly funded by income taxes and federal subsidies, though many citizens also take out private insurance plans to help cover supplementary services.[6] About 95% of Canada's physicians are members of the nonprofit Canadian Medical Protective Association (CMPA), which covers malpractice premiums for its members; provides legal defense for member physicians facing lawsuits; and pays any compensatory financial awards to patients.[7]

In South Africa, the Medical Protection Society provides protection for member physicians, and the majority of neurosurgeons in South Africa are in private practice. This organization classifies neurosurgery as a separate category, higher than the "Super High Risk" category. The most recent annual premium for neurosurgeons was R406,230 (roughly $26,752) in 2015, almost double the premium from 2 years ago, R250,900 (roughly $16,522) in 2013.[8,9] The largest medical negligence payout in South Africa's history was in the private sector: R25 million (approximately $1,646,350), granted in 2013 to a patient who was left brain damaged after multiple neurosurgical operations, which may be related in part to this increase.[10] Among the minority of neurosurgeons who are exclusively state employed, there have been large claims made against the state as well.

The rise in malpractice premiums and the fear of litigation could potentially overshadow clinical decision making and lead many physicians, especially those in high-risk fields such as neurosurgery, to practice more defensively. Defensive medicine has been postulated to contribute as much as $60.2 billion annually to health care expenditures nationally, so it is possible that decreasing defensive medicine could lower health care costs.[11] This paper is one of the first steps toward comparing the practice of defensive medicine internationally and sheds light on potential changes that could be made to improve the medicolegal environment and decrease the practice of defensive medicine.

METHODS

An online survey containing 40 questions on perception of medicolegal liability risk and defensive medicine behavior was sent to neurosurgeons in South Africa, Canada, and the United States. The questionnaire was developed with input from numerous neurosurgical associations, including the Canadian Neurological Society, American Association of Neurological Surgery, American Board of Neurological Surgery, Congress of Neurological Surgery, Society of Neurological Surgeons, Neurosurgical Society of America, Society of University Neurosurgeons, Council of State Neurosurgical Societies, and Illinois State Neurosurgical Society.

The survey included questions in 7 domains: surgeon demographics, patient characteristics, physician practice type, insurance type, surgeon liability profile, defensive behaviors, and perception of the liability environment. The survey was completely anonymous and took an average of <10 minutes to complete. Respondents were not required to answer all questions on the survey. Data analysis was performed using IBM SPSS version 23 (IBM SPSS Inc., Armonk, New York, USA). Basic patient demographics were summarized using counts and percentages for nominal variables and means, medians, and standard deviations/ranges for continuous variables. Multivariate logistic regression was used to examine the correlation of medicolegal risk environment and defensive behavior.

RESULTS

Of the 3672 neurosurgeons surveyed, 1142 (31.1%) responded, including 62 Canadian neurosurgeons (36.5% response rate), 66 South African neurosurgeons (41.7%), 510 neurosurgeons from low-risk states in the United States (30.3%), and 504 from high-risk U.S. states (37.4%).

Canadian respondents reported practicing for an average of 17.2 years (standard deviation [SD] = 9.9), while South African respondents reported practicing for an average of 17.1 years (SD = 9.3). Neurosurgeons from low-risk U.S. states practiced for an average of 16.0 years (SD = 8.7), and neurosurgeons from high-risk U.S. states practiced for an average of 16.6 years (SD = 8.7). Canadian neurosurgeons reported having an average of 205 cases annually (SD = 94), compared with 292 for South African neurosurgeons (SD = 130), 259 for respondents from low-risk U.S. states (SD = 106), and 259 for respondents from high-risk U.S. states (SD = 106) (Table 1). A majority (88.1%) of Canadian respondents reported having a practice size of at least 2 colleagues, while only 15.4% of South African respondents reported so. A slight majority of respondents from low-risk U.S. states (58.6%) and high-risk U.S. states (65.8%) reported having at least 2 colleagues (Table 2).

Among Canadian respondents, 80.4% reported having mostly white patients, compared with 59.0%, 79.9%, and 86.4% of South African, low-risk U.S., and high-risk U.S. respondents, respectively (Table 3). A hundred percent of Canadian neurosurgeons reported having mostly publicly insured patients. On the other hand, 23.1% of South African neurosurgeons had mostly publicly insured patients, compared with 32.0% of neurosurgeons from low-risk U.S. states and 25.4% of respondents from high-risk U.S. states (Figure 1).

The majority of Canadian neurosurgeons (72.0%) reported no change in their liability premiums in the past 3 years, while 70.2% of respondents from low-risk U.S. states said the same. Most (88.3%) South African respondents and 48.0% of respondents from high-risk U.S. states reported an increase in their liability premiums in the past 3 years.

The majority of South African neurosurgeons (84.8%) reported that they believe there is an ongoing medical liability crisis. Similarly, 82.9% of respondents from high-risk U.S. states reported belief in an ongoing medical crisis, compared with 63.5% from low-risk U.S. states and only 16.9% from Canada. The large majority of Canadian respondents (80.7%) did not view their patients as potential lawsuits (Table 4). On the other hand, South African respondents (57.6%), those from low-risk U.S. states