Burden of Stroke in Qatar

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Background: Qatar is located on the northeastern coast of the Arabian Peninsula. The total population is over 2.1 million with around 15% being Qatari citizens. Hamad General Hospital (HGH) is the only tertiary referral governmental hospital in Qatar which admits acute (thrombolysis-eligible) stroke patients. *Objective:* To provide an overview of the burden of stroke in Qatar. *Methods:* Data from literature databases, online sources and our stroke registry were collated to identify information on the burden of stroke in Qatar. *Results:* Overall, over 80% of all stroke patients in Qatar are admitted in HGH. In 2010, the age-standardized incidence for first-ever ischemic stroke was 51.88/100,000 person-years. To date our stroke registry reveals that 79% of all stroke patients are male and almost 50% of stroke patients are 50 years or less. Hypertension, diabetes and dyslipidemia are the main predisposing factors for stroke, with ischemic stroke being more common (87%) than hemorrhagic stroke (13%). Despite the lack of a stroke unit, 9% of ischemic stroke patients are being thrombolyzed. However the presence of a stroke ward allows swift turnover of patients with a length of stay of less than 5 days before discharge or, if required, transfer to the fully-equipped hospital-based rehabilitation service. Several community awareness programs are ongoing, in addition to several research programs funded by the Qatar National Research Fund and Hamad Medical Corporation. *Conclusion:* In a country where over 15% of the population suffers from diabetes there is continuous need for national community-based awareness campaigns, prevention and educational programs particularly targeting patients and health care workers. **Key Words:** Stroke—Ischemic stroke—Hemorrhagic stroke—Qatar—Thrombolysis.

Introduction

Stroke is the leading cause of disability in adults and the second leading cause of mortality worldwide.[1] In Western countries as well as in low- and middle-income countries, it is responsible for 85% of all deaths.[2]

Qatar is located on the northeastern coast of the Arabian Peninsula, covering a territory of approximately 11,437 km^2 having a sole land border, with Saudi Arabia to the south and the rest of its territory surrounded by the Arabian Gulf. In August 2015, Qatar's total population was just over 2.1 million with around 15% Qatari citizens and the remaining citizens being expatriates (also referred to as non-Qatari).[3]

Qatar's natural resources (petroleum and gas) are the cornerstone of Qatar's economy, providing it a gross domestic product per capita that ranks among the highest in the world. Over the past few years, Qatar's public healthcare budget witnessed a rapid increase and is one

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of the highest in the Arabian Gulf region. In 2012, the total expenditure on health care per capita was U.S.$1805 or 2.2% of GDP.[4] Qatar's total population is relatively young, with a median age of 30 years.[5] The median age of the Qatari population is younger than that of the non-Qatari population (19 years compared with 30 years, respectively).[5] Qatar's median population age is lower than the average median age in the European Union (41 years in 2011).[6]

The high rate of urbanization and changes in lifestyle profile—reduced physical activity and increased consumption of calories and diets rich in fat—and the rapidly aging population contribute to cardiovascular morbidity and mortality.[7-10] The prevalence of diabetes is estimated to exceed 15% in Qatar as compared to 11% in the United States.[11]

Hamad General Hospital (HGH) is the only tertiary referral governmental hospital in Qatar that admits patients with acute (thrombolysis-eligible) stroke. In addition, patients with non–thrombolysis-eligible and nonacute stroke are admitted in HGH and its satellite hospitals (Al Khor and Al Wakra). Private hospitals in Qatar are not involved in stroke admission and care. In 2014, 899 stroke patients were admitted in Qatar, of which 81.5% were admitted in HGH, 10.8 % in Al Khor, and 7.6% in Al Wakra. Free healthcare service for all Qatari nationals is the cornerstone of the healthcare program. In addition, when expatriates are admitted through the emergency department of governmental hospitals (HGH and all satellite hospitals), medical care is free for the first 4 days of admission. This unique setting, in addition to the availability of an excellent physical medicine and rehabilitation stroke service as well as allied health services (occupational, speech, and physiotherapy) and stroke clinics, makes HGH an excellent opportunity for studying stroke.

This paper provides an overview on the burden of stroke in Qatar. In particular, epidemiological data, risk factor profile, acute stroke service and tissue plasminogen activator treatment, burden, and barriers in delivering thrombolysis therapy in this fast developing country will be considered.

Mortality

In 2012, Qatar's crude death rate was 1.1 deaths/1000 population for the total population: 2.5 for the Qatari population and 0.9 for the non-Qatari population.[5] Cardiovascular disease (20%) accounted for the primary cause of death in the expatriate population (17%) and was the second commonest cause of death following cancer (22%) in Qatari nationals. Overall, 12% of registered deaths were related to cardiovascular disease: 15% in the Qatari population and 11% in the expatriate population. The difference in percentage between the 2 populations reflects their different demographic compositions. In 2010, the age-standardized mortality rate for ischemic stroke was 9.17/100,000 person-years compared with 31.27/100,000 person-years in 1990.[12] The age-standardized mortality rates for hemorrhagic stroke was 13.21/100,000 person-years compared with 35.30/100,000 person-years in 1990.[12] At HGH, the overall in-hospital 30-day mortality rate in 1997 was 16%[13] and gradually decreased to 9.3% in 2005[14] and 4% in 2014 (unpublished data).

Epidemiology

In 2010, the age-standardized incidence for first-ever ischemic stroke was 51.88/100,000 person-years compared with 46.52/100,000 person-years in 1990.[12] The age-standardized incidence for first-ever hemorrhagic stroke was 14.55/100,000 person-years compared with 11.07/100,000 person-years in 1990.[12] Thus far, 3 studies have been published on the epidemiology of stroke in Qatar. A retrospective study of first-ever stroke (n = 217; 157 men and 60 women) was conducted in the Neurology Division of HGH in 1997.[13] The large majority of patients experienced ischemic stroke (80%), while intracerebral hemorrhage and subarachnoid hemorrhage accounted for 19% and 1%, respectively. The mean age of patients experiencing their first stroke was 57 years. Thirty-nine (18%) patients were younger than 45 years. Khan et al.[14] conducted a 1-year prospective study in 2004 on first-ever stroke (n = 270) at the same institution. Ischemic stroke was diagnosed in 80% of patients. Lacunar infarct was the most common subtype of ischemic stroke. A 2-year prospective case–control study performed at HGH in 2006 revealed that 54% of stroke patients were younger than 55 years, 66% of them being male.[15]

To date, our stroke registry reveals that from the 1491 stroke patients included, 19% are Qatari (55% male and 45% female) and 81% are non-Qatari (85% male and 15% female). This results in an overall male-to-female ratio in our stroke population of 3.76 (79% male). The large preponderance of male non-Qatari patients is explained by the huge male labor force represented in the country's population. In the non-Qatari population, the male-to-female ratio is 3.76,[16] whereas its male-to-female ratio for stroke patients is 5.67, indicating that non-Qatari men are more at risk for having a stroke than their female counterparts. While in the Qatari population these figures are more balanced. However also in the Qatari population there is a male preponderance (male-to-female ratio 0.96),[16] while the male-to-female ratio for stroke patients is 1.22.

Because there are equal opportunities for all patients in Qatar to visit emergency departments across the country free of charge, differences in accessibility to medical services cannot account for the differences in stroke rates observed between the Qatari and non-