

## **PREVALENCE OF STROKE IN KINGDOM OF SAUDI ARABIA - THROUGH A PHYSIOTHERAPIST DIARY**

**Khalid A Alahmarie, Paul S. S. and S. P. Anbuudayasankar**

### **ABSTRACT**

In Saudi Arabia, according to statistics, cardiovascular disease amounts to a major cause of deaths each year. Current data on stroke in the Kingdom of Saudi Arabia are lacking. This study is a national survey to inform decision-makers on the current magnitude of the epidemic. The data obtained for this study is from the nationwide physiotherapy departments that provide rehabilitative treatments to stroke patients. The study also tries to systematically analyze the published prevalence of many international countries and have tried to compare it with the available data of stroke prevalence in Saudi Arabia. The results shown in this study do make us understand that it is still not late to bring in preventive actions against stroke in Saudi Arabia.

**Keywords:** stroke, prevalence, saudi Arabia

### **INTRODUCTION**

“Health care is an increasing concern” is the usual paragraph starter of any health related journal paper written in GCC country. Be that the McKinsey report by Mourshed *et al.*, 2006, or Algazy *et al.*, 2009 or Klautzer *et al.*, 2014, each of these papers constantly remind about the health care problems to be envisaged in Gulf Countries. It may seem biased to call a Country to be “very high in coronary heart diseases” (Klautzer *et al.*, 2014), and for researchers to predict that GCC will have an exponential growth in the number of lifestyle diseases in the coming future. This paper would rely heavily on the McKinsey report that projects treatment demand in

GCC by 2025. Over the next 20 years, treatment demand will rise in the GCC by 240 percent. It is also expected that in particular, cardiovascular disease will experience a steep increase (419 percent), as will diabetes-related ailments (323

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percent). But most of these projections are made generic, for example, cardiovascular, infectious disease, maternal and perinatal disease, and digestive and genitourinary diseases etc. Keeping this statistics in mind this research is an attempt to find out the total cases of Stroke patients in Kingdom of Saudi Arabia, one that would help in deep probing of the problem at hand. The Kingdom of Saudi Arabia (KSA) is the largest country in the Middle East occupying approximately four-fifths of the Arabian Peninsula supporting a population of more than 28 million. In Saudi Arabia, according to statistics, cardiovascular disease amounts for 22 percent of deaths each year. Current data on stroke in the Kingdom of Saudi Arabia are lacking. We conducted a national survey to inform decision-makers on the current magnitude of the epidemic. Stroke otherwise called hemiplegia is caused due to blood clots or embolus which travels in the systemic circulation suddenly blocks the arteries of the brain leading to paralysis of the opposite side of the body being supplied by the brain, if the right side of the brain is affected, the left side of the body becomes paralyzed and vice versa, it is a cerebrovascular accident ultimately due to ischemic changes or lack of blood flow. Stroke is increasingly emerging as a major health problem, in Middle East region (Tran *et al.*, 2010). In a study by Kamran *et al.*, 2007 reported that a major percentage of the patients had not even heard the term "stroke" in the Gulf Cooperation Council (GCC) countries. The most important information that the study gave was that knowledge regarding stroke was poorest among the groups that belonged to the highest risk bracket for stroke. Studies have looked into the cause factors of stroke in Middle East region and have attributed old age, high blood pressure, prior stroke or Transient Ischemic Attack (TIA), diabetes, high cholesterol, tobacco smoking and atrial fibrillation as the major risk factors for stroke. Studies have proved that a person with diabetes, blood pressure, or high cholesterol is more at risk for a stroke (Awada and Al Rajeh, 1999). A lot of factors that increase the risk of a stroke includes obesity, smoking, sedentary lifestyle etc are some of the causes. Even gender differences of stroke in Saudi Arabia are studied and research indicates that there were more men with strokes of all types than women (Yaqub *et al.*, 1991).

Depending on the severity and type, stroke can leave an individual with a residual damage of physical, psychological, social and cognitive functions. In another study by Al Khathaami *et al.*, 2011 who interviewed neurologists about their views reports that acute stroke care in Saudi Arabia as inadequate. Al Rajeh *et al.*, 1993, who studied about 500 consecutive patients with first-ever stroke admitted in a hospital that exclusively serves the Saudi Arabian National Guard community suggested that stroke incidence is low in Saudi Arabia compared with industrialized countries, which could be because of the predominance of young age groups. The study held that overall distribution of stroke types was closer to that of Western populations than to the Japanese, in whom hemorrhagic strokes were highly prevalent at that time. Ever since 1993 there has been an increase in the number of stroke patients. Akbar *et al.*, (2001) showed that stroke was more frequent in the sixth decade of life with male predominance in both Saudis and non-Saudis, a finding similar to what has been reported by others (Al Jishi and Mohan 1999, Awada and Al Rajeh, 1999).

Research has shown that the Middle East region faces a double burden of the disease due to decreasing rates of communicable diseases and the growing rates of non-communicable diseases (Akala and El-Saharty, 2006). Qari (2000) conducted a study among stroke patients admitted at King Abdul Aziz University Hospital and found that there was a high incidence of thrombotic stroke in our study. In 2012 a study was conducted by Al Aqueel *et al.*, who reported that there is an alarming deficit in the level of stroke awareness in the Saudi population. Urgent public health measures to correct this deficiency, which will match the rate of similar countries, is suggested to be made.

There is a dearth of stroke data in physiotherapy departments and rehabilitation in Saudi Arabia. Research studies available on stroke cases in physiotherapy deals with trials, experiments and interventions. One study has looked into the characteristics are most associated with free-living physical activity in community-dwelling ambulatory people after stroke, but the respondent size was 18 cases (Alzharani *et al.*, 2011). But these studies would not be able to bring about the real size of stroke epidemic in the country.

In all the published literature available on stroke in Middle East region are either projections or is specific to particular regions of Saudi Arabia. This paper is one of a kind in itself that we have conducted a national level survey in order to find out the prevalence of Stroke cases in the whole Kingdom from a physiotherapist perspective. The data has the number of stroke cases present in physiotherapy departments in each of the region of the Kingdom. Such a data can help the policy makers to take actions to start organising nation-wide stroke care and to further up on the existing evidence-practice gap as reported by many researchers.

## METHODOLOGY

The data of total stroke cases in the whole of Saudi Arabia in the year 2012-2013 is collected. The total number of population in Saudi Arabia is 27 million, including nearly 8.5 million expatriates (2010 census). The provinces of Saudi Arabia are divided as follows.

The prevalence of stroke in KSA is more difficult to estimate accurately. A prevalence of 178/100,000 was reported in a community based survey from the Eastern region of KSA (Awada and Al Rajeh, 2002, Awada, 2011). Overall, the incidence and prevalence of stroke in KSA appears to be lower than the rates in the Western countries but falls within the range observed among Asian populations (Ayoola, 2003).

### **Period Prevalence Rate of Stroke according to the data in Saudi**

By using the formula, Period prevalence = Number of cases occurred in a given period / no of people in the given population during this period X 100

## DISCUSSION

Prevalence is an estimate of how many people have a specific disease, condition or risk factor at a given point in time. These rates are applied as the population changes for several years, until a new health examination survey is done and new rates are established. It's important to realize that the prevalence rates **do not change** from year to year until there is a new survey. There is a dearth of nationwide data availability on stroke in the KSA.

From the data, it can be understood that prior studies in Middle East were correct, that the stroke epidemic in the region is lesser than that of Asia, USA and China. This study also reveals that among the regions of Saudi, Qunfuthah, Al Hassa, Jazan and Quassim are leaning towards higher prevalence for stroke. In a similar study by Ayoola *et al.*, 2003, collected data on patients with stroke admitted to King Fahd Central Hospital, Jizan, KSA over a 2-year period from January 1997 to December 1998, and found the crude incidence (estimated as 15.9 per 100, 000) in Jizan, KSA. The researchers concluded that a national stroke registry should be strengthened to provide further information on the epidemiology of stroke in KSA.

In Saudi Arabia, the prevalence of strokes is low when compared with those recorded in the Western and Asian countries, which could be because of the predominance of the younger age groups in this region. There is a need to monitor the food habits and life style of the youngsters in the country so that the stroke epidemic can be kept in check. This research brings out the fact that Saudi Arabia is still not higher in stroke epidemic and this epidemic can be controlled in the country provided more proactive screening and diagnosis can be made. Despite the food habits, money and any associated reason for stroke prediction in the GCC, Saudi Arabia can still be called healthy when it comes to stroke.

Table 1: Literature Review

Researchers	Area in KSA	Type of Paper	Conclusion
Robert and Zamzami (2014)	Riyadh	Literature Review	No nationwide, research has been conducted recently on the incidence and prevalence of strokes in Saudi Arabia. However, over the past decade there was one study which reported that the crude incidence rate for first-ever incidence of stroke in Saudi Arabia was 29.8/100,000/year.
Rajeh and Awada, 2002	KSA	Empirical study	High frequency of strokes in the young and strokes related to small artery disease, i.e. lacunar infarcts and cerebral hemorrhage, and the high prevalence of diabetes mellitus as a risk factor were quite distinctive.
Yaqub <i>et al.</i> , 1991	Riyadh	Empirical study	Cerebral infarction constituted 87% of strokes, Subarachnoid hemorrhage 4.5%, Cerebral hemorrhage 6.5%, and venous infarction 2%.
Ayoola <i>et al.</i> , 2003	Gizan	Empirical Study	The crude incidence (estimated as 15.9 per 100,000) in Gizan, KSA, a largely rural area is lower than the reported rates in urban areas of KSA.
Alaqeel <i>et al.</i> , 2012	Riyadh	Empirical study	2862 (82% response rate) completed the questionnaire. 1844 (64%) were able to define stroke correctly. 1428 (49.9%) named mass media as the source of their knowledge.
Salih <i>et al.</i> , 2006	KSA	Project	This retrospective and prospective study, which spanned 10 years and 7 months, is one of the largest cohort of children with stroke at one medical centre worldwide. 2. Among the study group of 104 Saudi children, ischemic stroke accounted for the majority of cases (82%), whereas intracranial hemorrhage was less common (18%).
Ministry of health, 2014	KSA	Report	A single center study in KSA showed a prevalence of stroke to be 29 per 100,000 per year; larger and methodologically sound studies are required to accurately describe the prevalence of stroke in KSA

**Table 2: The 13 provinces and city population and cases of stroke**

<i>Province</i>	<i>Cities</i>	<i>Population</i>	<i>Cases</i>
Riyadh Province	Riyadh	5,328,228	1632
Makkah Province	Makkah	1,675,368	380
	Qunfuthah	24,512	166
	Jeddah	3,456,259	530
Madinah Province	Madinah	1,180,770	932
Qasim Province	Buraidah	1,337,600	868
Eastern Province	Hafr Al Batin	389,993	160
Asir Province	Abha	366,551	7
	Al Bishah	86,201	188
Tabuk Province	Tabuk	569,797	203
Hail Province	Hail	412,758	396
Northern Border Province	Ar'ar	351,000	311
	Qurrayat	116,162	63
Jizan Province	Jizan	1,497,400	2150
	Quassim	614,093	868
Najran Province	Najran	555,100	68
Baha Province	Baha	450,700	213
Jouf Province	Sakakah	483,100	251
Eastern Province	Al Hasa	1,063,112	2345

**Table 3: Period Prevalence Rate of Stroke**

<i>Cities</i>	<i>Population in 2013</i>	<i>Cases in 2013</i>	<i>Prevalence</i>
Riyadh	5,328,228	1632	0.03%
Makkah	1,675,368	380	0.02%
Qunfuthah	24,512	166	0.67%
Jeddah	3,456,259	530	0.015%
Madinah	1,180,770	932	0.21%
Buraidah	1,337,600	868	0.064%
Hafr Al Batin	389,993	160	0.078%
Abha	366,551	7	0.001%
Al Bishah	86,201	188	0.035%
Tabuk	569,797	203	0.095%
Hail	412,758	396	0.095%
Ar'ar	351,000	311	0.088%
Qurrayat	116,162	63	0.05%
Jizan	1,497,400	2150	0.14%
Quassim	614,093	868	0.14%
Najran	555,100	68	0.01%
Baha	450,700	213	0.04%
Sakakah	483,100	251	0.05%
Al Hasa	1,063,112	2345	0.22%

**Table 4: Crude Prevalence/ Incidence of stroke worldwide:**

<i>Researchers</i>	<i>Country</i>	<i>Year</i>	<i>Prevalence/ Incidence</i>
Janes, Gigli, D'Anna, Cancelli, Perelli, Canal, Russo, Zanchettin, Valente	Italy	2013	784 stroke cases, 640 (81.6%) incident
M.A. Busch A. Schienkiewitz E. Nowossadeck A. Gößwald	Germany	2013	Out of the 7,238 persons visited one of the 180 examination centres, 914 were interviewed. The lifetime prevalence of stroke in the age group 40–79 years overall is 2.9%. The prevalence is 2.5% in women and 3.3% in men.
Sun, Zou, Liu	Beijing	2013	1,285 in 10,0000 population
Suwanwela	Thailand	2014	The most recent Thai Epidemiological Stroke Study found that the prevalence of stroke in populations over the age of 45 is 1.88%. Men had a higher prevalence of stroke than did women in all age groups. Stroke prevalence differed among the five geo graphic regions of the country with the highest prevalence in the capital city, Bangkok (3.34%) followed by central (2.41%), southern (2.29%), northern (1.46%), and north-eastern regions (1.09%).
Sher, Shah and Kumar	Pakistan	2013	the rate of total stroke for those aged less than 45 years ranged from 0.1 – 0.3 per thousand person years, while those aged 75 – 85 years, the rate was 10 – 12.
Pandian and Sudhan	India	2013	According to the India stroke factsheet updated in 2012, the estimated age-adjusted prevalence rate for stroke ranges between 84/100,000 and 262/100,000 in rural and between 334/100,000 and 424/100,000 in urban areas.
Stroke foundation, Australia	Australia	2013	In 2012, there were over 420,000 people living with the effects of stroke. There were about 25% more males (233,171) than females (187,099).
Tran, Mirzaeri, Anderson and Leeder	Middle East	2010	Incidence rates for all strokes ranged from 11.7 per 100 000 in Qatar to 63 per 100 000 in Libya. Incidence rates for hemorrhagic stroke were 2.7 per 100 000 in Qatar, 1.9 per 100 000 in Saudi Arabia and 10.4 per 100 000 in Iran. The two incidence rates for ischemic stroke in Iran were vastly different. One was reported for the young at 8 per 100 000 and the other included all ages, finding an incidence rate of 43.2 per 100 000.
Wasay, Khatri and Kaul	SAARC	2014	The estimated annual incidence of stroke in Pakistan is 250 per 100,000 population, which is projected to an estimate of 350,000 new cases every year. Sri Lanka, with its population of about 20 million, has an estimated stroke prevalence of 9 per 1,000 population. No data are available from Afghanistan, Nepal, Bhutan and Maldives. The

*contd. table*

Researchers	Country	Year	Prevalence/ Incidence
			lack of authentic incidence and prevalence data from Pakistan, Bangladesh and Sri Lanka is a major limitation, and a pressing need exists for population-based studies in these countries. If data from India are generalized for South Asia, we can safely say that the incidence and prevalence of stroke in this region is higher than in the USA and China.
Centers for disease control and prevention	2013	USA	The prevalence of a history of CHD/stroke among all adults aged <55 years was estimated to be 2.8%, including 2.0% for coronary heart disease and 1.0% for stroke. The prevalence among employed adults was 1.9%

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