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Full Length Research Paper

Demographic characteristics of stroke patients in developing countries: Example from Jordanian government hospitals

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The aim of this study was to identify for the first time, the characteristics of stroke patients in Jordan. In this retrospective study, the case records of 1,287 stroke patients admitted to Al-basher Hospital during a three-year period were reviewed. The stroke patient cohort included 60% men and 40% women. The mean age for men was 59.5±9.7 and 58.95±10.7 for women. Three quarters of all stroke patients were diagnosed as having ischemic strokes and 14% were diagnosed as having haemorrhagic. The most common risk factors were high blood pressure, diabetes and heart disease. The present data established important information about stroke characteristics in Jordanian hospitals. There was missing information in patients' records which made it difficult to calculate important epidemiological data which is necessary to plan for and provide better services for patients. This study has demonstrated the need for further research to explore reasons for inadequacies in services and to identify the best way of fully recording accurate information in developing countries.

Key words: Stroke patients, developing countries, government hospitals, stroke type, risk factors, demographic characteristics.

INTRODUCTION

Stroke is a leading cause of death and, for those who survive a stroke, the condition is a major cause of functional disablement (Bonita et al., 1990). Understanding demographic characteristics of patients is necessary in order to assess patients' needs, to improve the quality of life of patients and their careers, and to develop new services for stroke survivors (Ebrahim and Harwood, 1999). However, there are only a limited number of studies in developing countries which have investigated the demographic characteristics of stroke patients in hospitals (Bonita et al., 1997). In Jordan, there is as yet no information available relating to the stroke profile. Reports from Middle East Arabian countries (Al-Rajeh et al., 1991, 1993; Yaqub et al., 1991) where the lifestyle, religion and cultural traditions are similar to those in Jordan, indicates that stroke incidence increases with increased age and that it is higher in men than in women. Hypertension, smoking, diabetes and a trial fibrillation have also been found to be important risk factors in the incidence of stroke both in developing and developed countries.

The lack of information about stroke characteristics in developing countries including Jordan highlights the importance of demographic studies as they may provide a key to help in the planning of health care services and necessary preventive actions in a community. Thus, the present study was undertaken to establish the demographic characteristics of stroke patients in Jordan. The Hashemite Kingdom of Jordan is situated in the Middle East with an estimated population of nearly 5.7 million in 2007. Al-Basher Hospital was selected because it is the main and largest state referral general hospital in Jordan; the majority of stroke patients in Jordan are admitted to it and it maintains relatively reliable medical registers. This makes this hospital well suited for demographic study on stroke in Jordan.

METHODS

In this retrospective study, the case records of all stroke patients admitted to Al-basher Hospital, during the three-year period from 2008 to 2010 were reviewed. Al-basher Hospital is a 928 bed

Table 1. Numbers and percentages of stroke patients by age and gender at Al-basher Hospital, Amman.

Age group (years)	Male patients		Female patients	
	Number	%	Number	%
25-34	12	44	15	56
35-44	42	62	26	38
45-54	146	53	127	47
55-64	278	63	161	37
65-74	288	60	192	40
Total	766	60	521	40

tertiary care teaching hospital providing health care to a large section of Jordanian population. As the major and main hospital in Jordan, it serves as a principal referral centre for the entire Jordanian population.

The definition of stroke given by the World Health Organization (WHO) as 'rapidly developing clinical signs of focal disturbance of cerebral function, with symptoms lasting 24 h or longer or leading to death, with no apparent cause other than vascular origin' were applied (WHO, 1989). It was not possible to record stroke subtype in this study due to missing information about CT scans. In Al-basher Hospital, CT scan reports included only information as to whether the stroke was ischemic or haemorrhagic, and not the subtype.

Findings on CT scans of brain, performed within 1 week of the onset of stroke were used for classification of the type of stroke. Ischemic type was diagnosed based on typical CT scan findings of infarct or a normal CT scan when it was performed within 2 days of the onset of stroke or the presence of a potential source of cerebral emboli such as the heart or carotid artery relevant to the side of stroke (Awada, 1994). Hemorrhagic was diagnosed based on clinical and CT scan findings. Where none of these criteria were fulfilled or information was not available, the cases were classified as 'no data '. Hypertension was considered to be present if the patient was already receiving antihypertensive therapy or if the systolic blood pressure (BP) was >160 mmHg and/or diastolic BP was >95 mmHg at the time of admission and persisted even after that during the hospital stay (NCEP, 2001; TECDCM, 1999). Diabetes mellitus was considered to be present if the patient was already diagnosed and receiving medication for the same, or if at least 2 fasting blood glucose values were 7.8 mmol/L or above during the patient's hospital stay (JNCPDE, 1997).

The relevant data was retrieved from the case records of the patients and was entered on a standardized computer record form, comprising items like age, gender, CT services, stroke type, and length hospital stay, history of hypertension, diabetes mellitus, cardiac disease and stroke in the past.

RESULTS

Approximately 186,000 patients were admitted to Al-basher Hospital between 2008 and 2010; of these, 1,287 stroke patients satisfied the definition of stroke.

Age and gender

Table 1 shows the age and gender distribution of stroke patients. The stroke patient cohort included 766 men (60%) and 521 women (40%), giving a male-to-female ratio of 3:2. The mean age for men was 59.5±9.7 and 58.95±10.7 for women.

Figure 1 shows that the number of stroke patients admitted to Al-basher Hospital increased steeply with age. In the 25 to 34 age group, the number of patients who had had strokes was similar for both sexes. This number increased sharply in the 65 to 74 age group. As this figure shows, more men than women in all age groups had strokes except those aged between 25 and 34. The number of men affected by strokes peaked in the 55 to 64 and 65 to 74 age groups.

Diagnostic CT scanning

At Al-basher Hospital, three quarters of stroke patients underwent a diagnostic CT scan to help identify the type of stroke they had sustained and to ensure that necessary treatment was given as soon as possible. The mean time before stroke patients in Al-basher Hospital had their CT scan was approximately 27 days.

Classification of stroke type

Figure 2 shows that at Al-basher Hospital, about three quarters of all stroke patients were diagnosed as having ischaemic strokes and 14% were diagnosed as having haemorrhagic strokes. There was no data available for 11% of the stroke patients.

Length of stay

Figure 3 shows that the majority of stroke patients admitted to AL-basher Hospitals stayed for one week or less.

Risk factors

Figure 4 shows that the most common risk factors recorded for stroke patients in this study were high blood

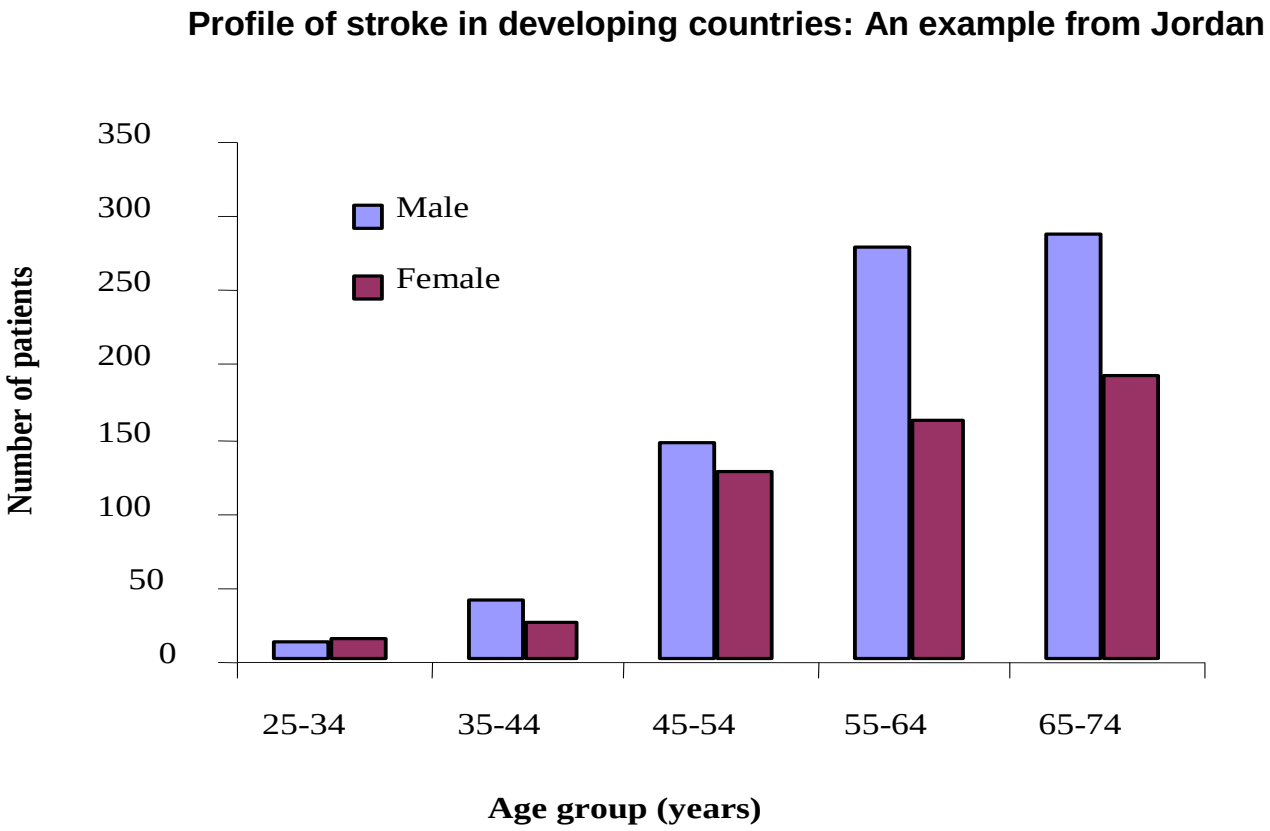

Figure 1. Stroke admissions to Al-basher Hospital (n=1287).

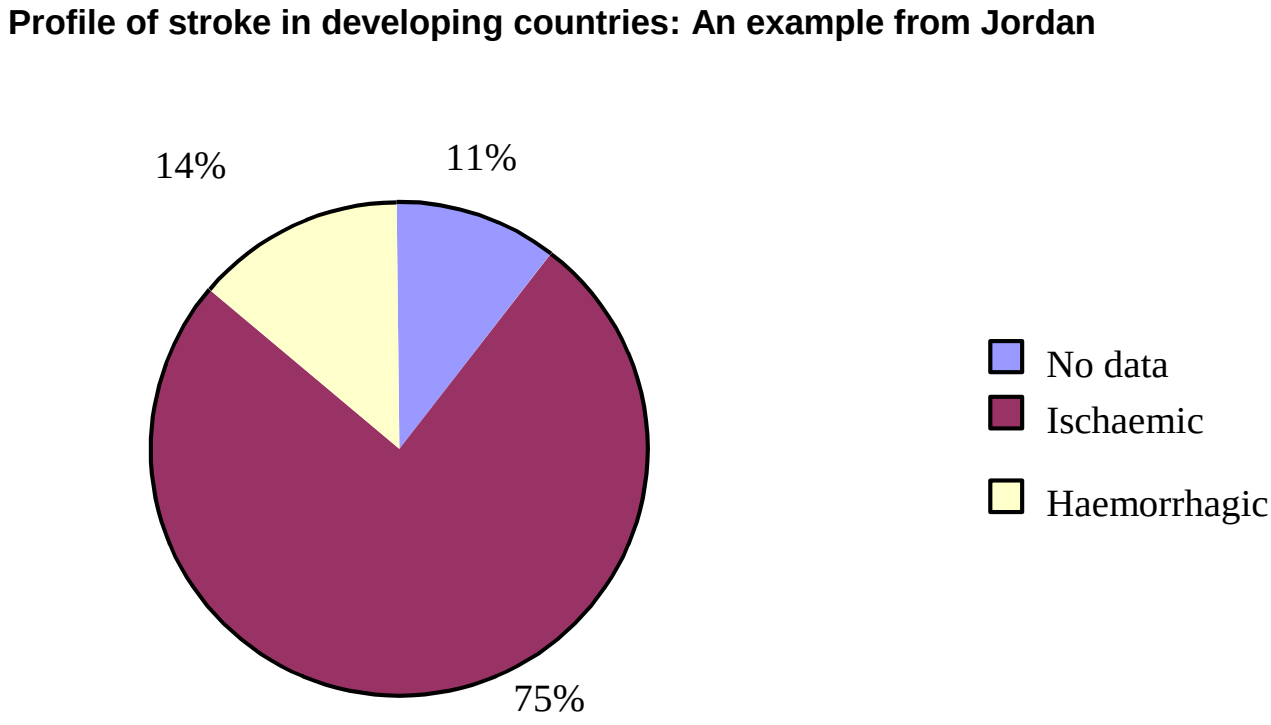

Figure 2. Classification of stroke type: Al-basher Hospital (n=1287).

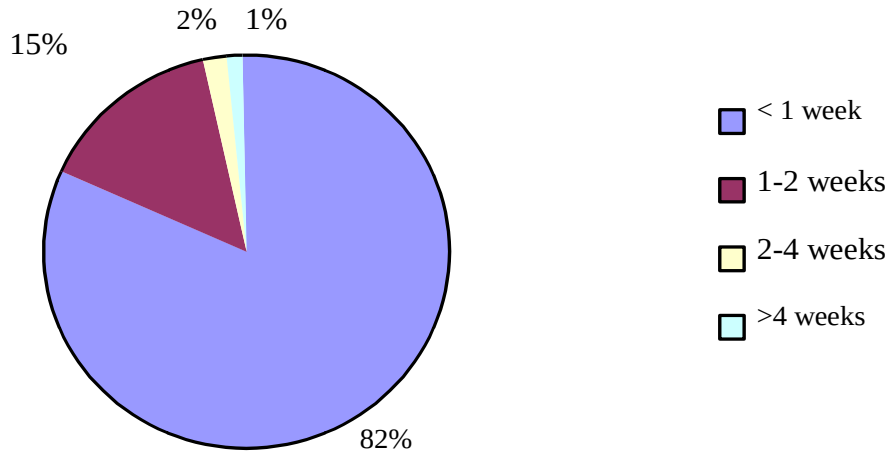

Figure 3. Length of in-patient stay for stroke patients at Al-basher Hospital (n=1287).

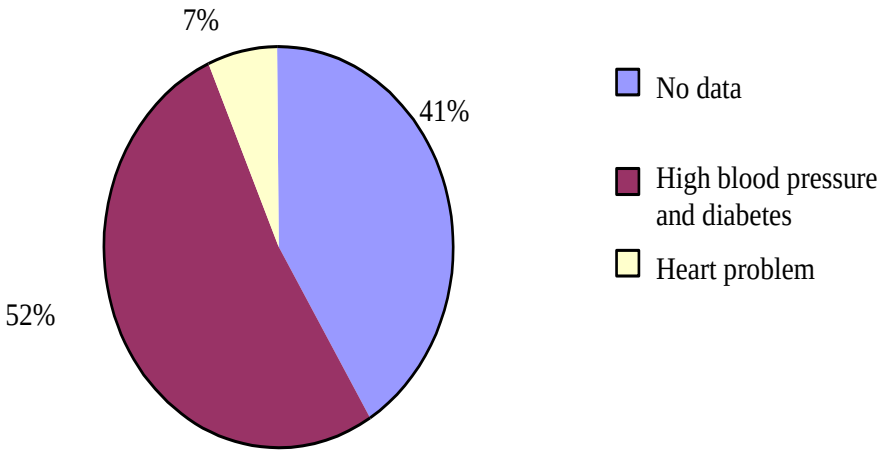

Figure 4. Risk factors for patients at Al-basher Hospital (n=1287).

pressure, diabetes and heart disease.

Stroke events

Table 2 shows that 81% of stroke occurrences were classified as first events and 17% as recurrent events. There was no information available for 2% of the stroke patients admitted to Al-basher Hospital.

DISCUSSION

The aim of this study was to identify the demographic characteristics of stroke patients admitted to state hospital in Jordan. This retrospective hospital-based study examined the records of 1,287 stroke patients who had been admitted to Al-basher Hospital in Amman-Jordan. Despite the limitations of hospital-based and retrospective studies, the findings of the study revealed very important information relating to the stroke profile in Jordanian hospitals such as age and gender, classification of stroke type, length of hospital stay and risk factors.

Age and gender

Stroke in this study affected more men than women and increased with increased age. The percentages of men

Table 2. Numbers and percentages of patients having first and recurrent strokes at Al-basher Hospital, Amman.

Age group (years)	First stroke		Recurrent strokes		Missing data (%)
	Number	%	Number	%	
25-34	23	86	3	7	7
35-44	66	97	0	0	3
45-54	232	85	22	8	7
55-64	350	80	87	20	0
65-74	366	76	104	22	2
25-74	1032	81	215	17	2

with stroke who were admitted to hospitals were about 60%. These findings were in accordance with other studies carried out in developed countries (Johansson et al., 2000; Stewart et al., 1999). These studies found that the stroke incidence rate was higher in older age groups and in men rather than in younger age groups and in women.

However, these studies used incidence rates. In the current study, it was not possible to calculate the incidence rate because in order to calculate this rate, the population in the area must be known and there should be a system where there is no duplication of registration. In the Amman area, there are four major state and 18 private hospitals and because of the health system and insurance provision in Jordan, patients can be treated at more than one hospital, leading to possible duplication of patient information.

In studies carried out in Saudi Arabia and Libya, countries where the lifestyle, religion and cultural traditions are similar to those in Jordan, the incidence rate of stroke was also higher for men than for women and stroke incidence increased with increased age (Ashok et al., 1986; El Sayed et al., 1999). The consistency of the findings of studies carried out in developed and developing countries and the current study indicate that age and gender may not be related to the cultural backgrounds of stroke patients.

Classification of stroke

The findings of this study showed that three-quarters of stroke patients admitted to Al-basher Hospital had ischaemic strokes and 14% of the patients had haemorrhagic strokes. These findings were slightly different from the findings of other studies undertaken in both developed and developing countries (Ebrahim and Harwood, 1999; El Sayed et al., 1999; Burn et al, 1997). These studies found that approximately 80% of strokes were ischaemic and 20% were haemorrhagic. Missing information in hospital records may explain the difference between the findings of these studies and the current study. There was no information available about stroke type for 11% in Al-basher Hospital.

In the current study, diagnostic CT brain scanning was used to identify the type of stroke and 72% of stroke patients in Al-basher Hospital underwent brain scans. However, the time before stroke patients had their CT scan was about 27 days, indicating that not all patients who were admitted to Jordanian hospitals underwent brain scanning and that those who did had their scans delayed. A possible reason for patients not having scans might be that many people were still not covered by health insurance, so could not afford the cost of scanning. A possible explanation for the delay in having CT scans might be that Al-basher Hospital is crowded, leading to long waiting times for scans.

The implications of not having CT scans or delays in having a CT scan are serious and can include delayed or inappropriate treatment. Both could be dangerous. Kelson et al. (1998) suggested that before treatment, accuracy of diagnosis is important, not only to define type of stroke but also to differentiate vascular from non-vascular stroke.

Length of hospital stay

The majority of stroke patients in the AL-basher Hospital stayed less than one week with an average stay of 3.1 days. This average stay is different from the average length of stay for stroke patients in developed countries; for example, the length of hospital stay for stroke patients was 95.2 days in Sweden (Holmqvist et al., 1993). The enormous difference between the average length of hospital stay in Jordan and in developed countries could be explained by different factors reported by Mawjdeh et al. (1997).

In Jordan, approximately 32% of the population are not covered by any health insurance (Suhimat, 2001), so, shorter hospital stays could be related to the financial status of the patients, leading them to request an early hospital discharge, while in developed countries such as Sweden, health and social insurance are covered by the state, so there was no worry about the cost of staying in hospital. Another possible explanation for the shorter

length of stay might be related to the quality of services in public hospitals, where crowding may lead to patients requesting an early discharge from hospital. About 20% of the patients in this study discharged themselves against medical advice. The implication of short hospital stays is that the responsibility of caring for patients at the very early stage and during the recovery stage is placed almost entirely on their families.

Risk factors

In this study, the major risk factors for stroke were found to be the combined effects of hypertension and diabetes mellitus.

This observation is consistent with studies carried out with stroke patients in countries with cultures similar to the Jordanian culture (Al-Rajeh et al., 1993; El Sayed et al., 1999). Heart disease constituted an important risk factor in this study, accounting for about 10% of all cases. In approximately 41% of stroke patients, no risk factors were found or recorded.

However, risk factors reported in other studies such as smoking, diabetes, limited physical activity; alcohol abuse and poor nutrition (Goldstein et al., 2001; Wolf et al., 1991) were not found in the current study. This does not mean that Jordanian stroke patients are free from these risk factors, but it may be that the missing information and the recording system made it impossible to identify these factors.

Recurrent stroke events

In this study, 17% of stroke patients admitted to Al-basher Hospital were classified as 'recurrent strokes'. The literature contains limited information about rates of recurrent stroke. In a Finnish World Health Organisation project, the percentage of recurrent strokes was lower than the findings of this part of the study, which was approximately 10% of stroke events (Mähönen et al., 1999). However, the Finnish study was carried out over ten years while the current study was carried out over three and the different research designs between the two studies may have influenced the findings.

A possible explanation of the different rates of recurrent stroke in these two studies could be the different health systems and cultural backgrounds of the people in these two countries. It has been suggested that the main factors associated with a higher risk of recurrent stroke are uncontrolled high blood pressure, a trial fibrillation and diabetes (Gubitz and Sandercock, 2000). The problems of access to services which can help control these factors may increase the chance of people who have had first strokes having second strokes. Due to the health care and health insurance systems in Jordan and the country's poor economic situation, patients may have difficulties accessing medical clinics and medicines, and may therefore be at high risk of recurrent stroke.

The clinical implications of recurrent stroke are important in developing care services for stroke patients because recurrent strokes leave patients with greater disabilities than a first stroke, and patients show poorer outcomes (Samsa et al., 1999). Because of the low standards of care in Jordanian hospitals and the lack of support in the community, it could be expected that the burden of recurrent stroke on families and on the community would be higher than the burden of first stroke. In order to reduce the effects and impact of recurrent stroke, health policy makers should provide better community support for carers and survivors, reduce the likelihood of recurrent stroke by providing information about preventative measures and make medication and necessary therapeutic interventions available to stroke patients.

Missing information

This study found a considerable amount of missing information in patients' medical records; there was no information about brain scanning available for 5%, about reasons for discharge for 12%, about risk factor for 41% and about classification of stroke for 11% of stroke patients admitted to Al-basher Hospital. One possible explanation for this missing information might be that in Jordan, medical records are paper-based and are kept manually and as such, lack consistency and completeness. Missing information in stroke patients' medical files may affect practice and research. In practice, as discussed earlier, the lack of information about stroke type may affect appropriate and timely intervention. Research may be affected because missing information such as correct diagnosis, date of birth and cause of death may make it impossible to calculate epidemiological data such as incidence and mortality rates. These are important indicators in planning community services for stroke patients (Ebrahim and Harwood, 1999).

Conclusion

This paper has presented a profile of stroke patients admitted to hospitals in Jordan, including stroke occurrence, accessibility to diagnostic tools such as brain scanning, length of hospital stay, and risk factors of stroke. Strokes occurred more frequently in men than in women and the risk increased with age. The major known risk factors were high blood pressure and diabetes. Comparisons with the profiles of stroke patients admitted to hospitals in other countries shows that stroke patients in Jordan stay less time in hospitals; more Jordanian stroke patients are readmitted to hospitals because of a second stroke, and Jordanian patients had difficulties accessing CT services. Furthermore, there was missing

information in patients' hospital records on the classification of stroke and the presence of risk factors.

The problems of access to services in Jordanian hospitals may lead to misdiagnosis and inaccurate intervention and, as a result, poor outcome. The missing information in patients' medical records made it difficult to calculate important demographic data which is necessary to plan for and provide better services for patients.

In order to provide better services, health policy makers need first, to make available all necessary diagnostic tools to enable appropriate intervention and second, to make sure that health professionals who work with stroke patients document all available information in their patients' medical records. Because family carers may take on the responsibility of caring in the early stages, when patients need a lot of attention and support, health professionals need to provide them with suitable information to allow them to play their role effectively and safely. This study has demonstrated the need for further research to explore reasons for inadequacies in services and to identify the best way of fully recording accurate information in developing countries.

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