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Research Note

Stroke patients' interpretation of symptoms and presentation to hospital

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Abstract. **Introduction** The aim of this study was to elucidate patient interpretation of stroke symptoms and to investigate factors which influence timely presentation to hospital. **Methods** All patients admitted to Mater Dei Hospital with a diagnosis of cerebrovascular accident (CVA) or transient ischaemic attack (TIA) between July and September 2011 were recruited prospectively. Data was collected by patient interview and with reference to medical notes in order to determine patient risk factors for stroke, knowledge on stroke, interpretation of stroke symptoms and time interval to presentation to hospital. **Results** The cohort studied ($N = 54$) had an average age of 67.9 years ($SD = 10.407$). The risk factors for cerebrovascular disease most frequently found in this group were hypertension (56%), hypercholesterolaemia (56%), family history of stroke (41%) and smoking (39%). Participants interpreted their symptoms as stroke in 33% of cases ($n = 18$), whereas 48% reported that they did not know or suspect any particular cause at the time. The perceived severity of events at symptom onset was reported as 'high' by 41% and 'low' by 57%. Only 31% of participants ($n = 17$) recognised the brain as the organ primarily affected in stroke. Forty five percent of patients sought medical advice within one hour. Fifty-six percent ($n = 30$) first resorted to their family doctor, whilst 28% ($n = 15$) phoned the emergency services. Family doctor as first contact was associated with delayed presentation ($p = 0.007$); conversely, phoning emergency services was associated with earlier presentation to A&E. **Conclusion** The results of this study highlight limited knowledge about stroke in the population involved. It also serves to clarify factors contributing to high rates of late presentation. These findings show the need for an improvement in public awareness in terms of education on stroke and the

importance of early presentation to hospital.

Keywords Stroke – transient ischaemic attack - symptoms - presentation – interpretation – recognition – awareness - thrombolysis.

1 Introduction

Intravenous thrombolytic therapy has been shown to improve outcome at three months in patients with acute ischaemic stroke (Wardlaw, 2001). This service has been available in Mater Dei Hospital since October 2010 and is a key inclusion criterion in administration of treatment within three hours of symptom onset. Late presentation to hospital remains the most frequent reason for exclusion from thrombolysis in Malta, despite the short distances and relatively easy access to medical services (Mallia, 2001).

The aim of the study was to investigate factors that contribute to late presentation, to elucidate patient interpretation of stroke symptoms and to identify potential points of intervention for future reversal of this trend.

2 Material and Methods

All patients admitted via the emergency department of Mater Dei Hospital with a provisional diagnosis of cerebrovascular accident (CVA) or transient ischaemic attack (TIA) between July and September 2011 were recruited prospectively.

Inclusion criteria were: the ability to communicate

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sufficiently to participate in the interview, informed consent, an age of above eighteen years and diagnosis of stroke or TIA on discharge. The main exclusion criterion was the inability to communicate and carry out the interview via verbal communication.

Approval for the study was obtained from the University of Malta Research Ethics Committee. Data was collected in a prospective manner from the following sources: patient interview, patient medical and nursing notes of index admission, hospital PACS (Picture Archiving and Communications System), iSOFT Clinical Manager (centralised investigation results) and PAS (Patient Administration System). Patient interview consisted of a structured questionnaire available in Maltese or English according to patient preference and were conducted by one of four researchers within 48 hours of admission.

The structured interview included the following questions: the nature of first symptoms felt, the time of the first symptoms, the participant's interpretation of these symptoms, knowledge on stroke, past personal experience or family history of stroke, the time and nature of medical assistance first sought, mode of transport to hospital and knowledge and recognition of risk factors for cerebrovascular disease. Hospital records were used to report the precise arrival time at the triage bay of the Accident and Emergency department. Patient admission records were used to obtain the patients known risk factors for cerebrovascular disease. Patient demographic data was also collected including age, gender and nationality.

3 Results and Discussion

The total number of admissions of acute ischaemic stroke or TIA during the three month period was 105, of which 51 (48%) were excluded. This gave a total population of 54 patients, which has reduced the power of statistical analysis. Therefore, results derived from this study have been used to demonstrate trends which in many instances could not be proven to be statistically significant. Similar publications used for comparison examining this subject were carried out with larger patient populations, therefore, comparison to these studies was also limited. Extension of the data collection period would increase the power of this study.

The reasons for exclusion were: inability to communicate, 59% ($n = 30$), discharge before interview, 22% ($n = 11$), a change in diagnosis, 16% ($n = 8$) and also withheld consent ($n = 2$). The large proportion of exclusions is a reflection of the high percentage of stroke patients with speech difficulties. But also of a significant proportion of stroke patients being elderly and the increased incidence of cognitive impairment in this age group.

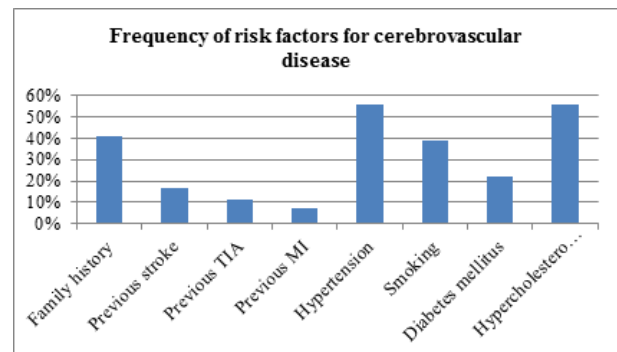


Figure 1: The profile of known risk factors for cerebrovascular disease present in the participant population.

This left a group of 54 participants, of whom 59% were male and 41% female. The average age being 67.9 years ($SD = 10.407$). The risk factors for cerebrovascular disease most frequently found in this group were: hypertension (56%), hypercholesterolaemia (56%), family history of stroke (41)

The only factor that was found to result in a statistically significant earlier presentation were those patients with a family history of stroke ($p = 0.016$). No statistical significance was found for the following factors: gender, nationality, the presence of three or more cerebrovascular disease risk factors, a past history of stroke or TIA, interpretation of severity, knowledge on stroke and perceived cause of symptoms. This may be due to the relatively low number of participants.

Knowledge of risk factors for stroke was poor, smoking (39%), excess alcohol intake (26%) and hypertension (20%) being those offered most frequently as risk factors known to patients. However, on being asked to choose from a list of lifestyle factors or medical conditions, a much higher proportion of patients correctly identified risk factors for stroke (shown in Fig.(3)).

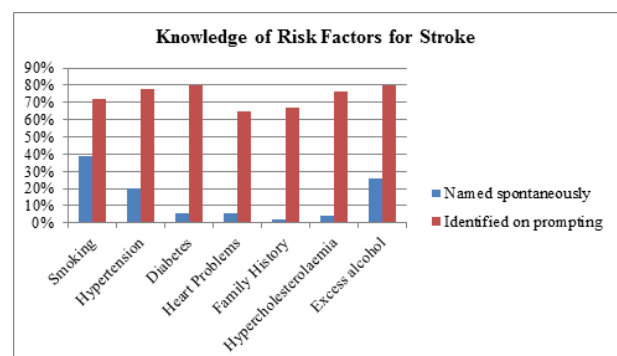


Figure 2: Patient knowledge of risk factors for stroke.

The symptoms most frequently reported by participants were: weakness (70%, $n = 38$), speech difficulty (44%) and sensory phenomena (30%). The subjective

sensation of 'dizziness' (differentiated by interviewers from vertigo) was reported by 28% ($n = 15$) of the participants. The other 19% reported various other suspected causes, such as a problem with the affected limb. These findings are important when considering which symptoms of stroke to place emphasis on when planning public health awareness projects, such as the 'Act FAST' campaign that has been carried out with success by the United Kingdom National Health Service. In this study, none of these presenting symptoms were found to be significant in influencing earlier presentation to hospital.

The perceived severity of events at symptom onset was reported as 'high' by 41% ($n = 22$) and 'low' by 57% ($n = 31$), assessed by asking patients how worried they were about their symptoms signifying a prominent health problem at the time of which they were experiencing them. Participants correctly identified the brain as the organ damaged by stroke in 31% of cases ($n = 17$). Thirty nine percent blamed the affected limbs as the source of their symptoms, whereas 22% replied that they did not know. These two questions offer the clearest demonstration of a widespread lack of basic understanding of stroke as a disease and its manifestations.

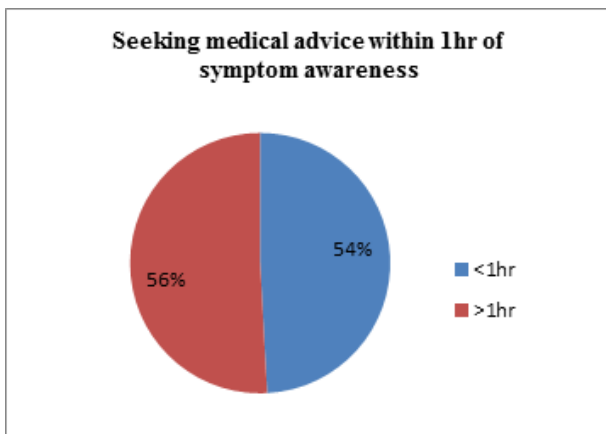


Figure 3: Participants who sought medical advice within 1 hour of symptom onset.

When making initial contact with medical services, 56% ($n = 30$) of participants first resorted to their General Practitioner (GP), 28% phoned the emergency services number 112, 11% made contact with their local health centre and 6% presented directly to Accident and Emergency. Making initial contact with a GP was associated with delayed presentation to hospital ($p = 0.007$), whereas phoning the emergency services number 112 with earlier presentation ($p = 0.009$). This compares well with the findings of two similar studies in the USA (Williams, 1997) (Rosamund, 1998) where use of the emergency services led to earlier presentation. This shows the need to focus on the role of primary care

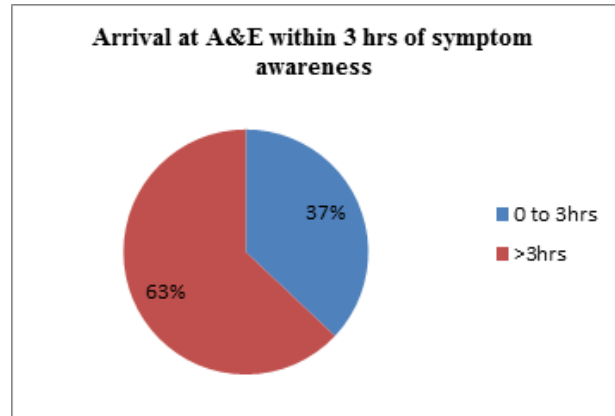


Figure 4: Arrival at the accident and emergency department within 3 hours of symptom onset.

services in Malta, along with public awareness, to drive improvement in management of acute ischaemic stroke, namely by ensuring rapid referral from primary to emergency and tertiary services.

A quarter of participants ($n = 14$) first sought medical advice about their symptoms within thirty minutes of symptom awareness and 45% ($n = 24$) within the first hour. Twenty percent ($n = 11$) only sought medical advice after 24 hours of first awareness of symptoms. One patient reported using the internet to search for information about stroke symptoms and subsequently contacted the emergency services.

Despite 45% of individuals seeking medical advice within the first hour, only 37% arrived at the emergency department within 3 hours of symptom onset. This shows a delay in time between first contact with medical services and arrival at hospital. Fig.(3) demonstrates the frequency of patients presenting at the given time periods, in hours, after symptom awareness.

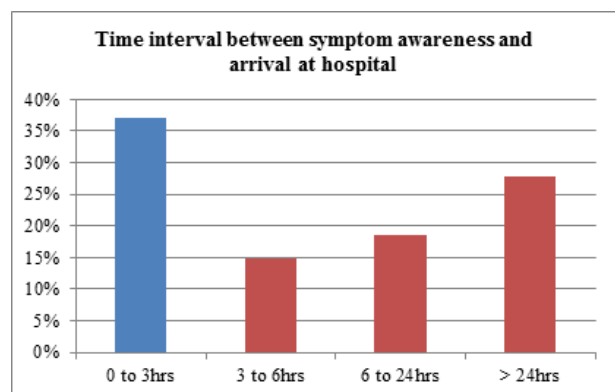


Figure 5: Time interval between symptom onset and arrival at the accident and emergency department. Sixty one percent ($n = 33$) of patients utilized emergency service transport, whereas 39% ($n = 21$) used private means of transport. None of the patients drove themselves.

4 Conclusions

The results of this study highlight limited knowledge about stroke in the population involved. This lack of awareness on cerebrovascular disease is associated with delayed presentation to hospital, which has important implications on outcome. The need for improved awareness is not restricted to the general public, but also extends to healthcare providers, notably primary care practitioners and allied healthcare professionals who are in a position to provide advice to the general public. The authors are aware that an initiative aimed at public awareness of stroke symptoms is underway by the Health Promotion Department which is ongoing.

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