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Original Article

SOCIO-DEMOGRAPHIC AND CLINICAL CHARACTERISTICS OF HEMORRHAGIC STROKE PATIENTS ADMITTED TO MEDICINE WARD IN DHAKA MEDICAL COLLEGE HOSPITAL

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ABSTRACT

Background: Hemorrhagic stroke, involving bleeding within the brain or surrounding areas, presents a distinct profile of socio-demographic and clinical characteristics. Hemorrhagic strokes are more common in older adults. However, younger individuals with certain risk factors can also be affected. *This study aimed to find out the socio-economic characteristics of hemorrhagic stroke patients.* **Methods:** This prospective observational study was conducted in the Medicine In-patients Department of Dhaka Medical College Hospital, Dhaka, Bangladesh, from October 2009 to March 2010. A total of 60 cases of hemorrhagic stroke were enrolled using a purposive sampling technique. Data analysis was performed using MS Office tools. ***Results:*** *The mean age of participants was 50.33 ± 8.93 years, with a male-to-female ratio of 3:1. 13.3% were illiterate, 60% had a monthly family income of over 10,000 BDT. Family history of stroke was reported by 13.3%, 28.3% experienced symptoms during sleep, 20% during work, and 15% during excitement. 58.3% experienced a sudden onset of symptoms. Frequent comorbidities included hypertension (40.0%) and diabetes mellitus (30.0%). Headache was the most common symptom (66.7%). Neurological exams showed normal consciousness in 66.7%, with varying grades in the remainder. Normal speech was noted in 70.0%, normal muscle bulk in 91.7%, and hypertonic muscle tone in 80.0%. Among hemorrhagic stroke patients, 51.7% had right-sided intracerebral hemorrhage on CT.* **Conclusion:** Older adults are particularly susceptible to hemorrhagic stroke. Most patients experience a sudden onset of symptoms, with headaches being the most common. Typically, patients retain normal consciousness, speech, muscle tone, and muscle bulk in the majority of cases.

Keywords: Socio-demographic, Clinical characteristic, Hemorrhagic stroke, Hypertension, Ischemic heart disease, CT scan.

INTRODUCTION

Stroke is a neurological disease and a leading cause of death and disability worldwide [1]. According to the World Health Organization (WHO), stroke is defined as the rapid onset of clinical signs of focal disturbance of cerebral function lasting more than 24 hours or resulting in death with no apparent cause other than vascular origin [2]. The incidence of stroke increases with age, significantly impacting older individuals. It is the third most common cause of death in developed countries, with age-adjusted annual death rates of 116 per 100,000 populations in the USA and approximately 200 per 100,000 in the UK [3]. In Bangladesh, there is insufficient data on the incidence and mortality rates of stroke. In the Western world, ischemic infarction accounts for 85% to 90% of stroke cases, while intracranial hemorrhages constitute 10% to 15%. However, in Asia, hemorrhages make up a larger percentage of stroke cases [4]. Risk factors for stroke include both irreversible or non-modifiable factors, such as age, sex, and heart disease, and modifiable factors like hypertension, diabetes mellitus, hyperlipidemia, smoking, excessive alcohol consumption, polycythemia, and the use of oral contraceptives [4]. The World Health Organization defines stroke as “rapidly developed clinical signs of focal or global disturbance of cerebral function, lasting more than 24 hours or until death, with no apparent non-vascular cause” [5]. Brain damage occurs due to a blockage of blood supply caused by embolism atherosclerosis, or a burst blood vessel [6]. Approximately 80% of strokes are ischemic in origin, while the remaining 20% are hemorrhagic [7]. Ischemic stroke, the more common type, occurs when

the blood supply to the brain is interrupted due to the blockage of tiny blood vessels by a blood clot or atherosclerosis, leading to cerebral ischemia (infarction). Treatment for ischemic stroke often involves intravenous thrombolytic therapy [8,9]. Hemorrhagic stroke, on the other hand, results from the rupturing of blood vessels in the brain, often due to an aneurysm, leading to bleeding in the surrounding tissues [10]. The objective of this study was to find out the socio-economic characteristics of hemorrhagic stroke patients.

METHODOLOGY

This prospective observational study was conducted in the Medicine In-patients Department of Dhaka Medical College Hospital, Dhaka, Bangladesh, from October 2009 to March 2010. A total of 60 cases of hemorrhagic stroke were selected as study subjects using purposive sampling. The research protocol received ethical approval from the Bangladesh College of Physicians and Surgeons, Dhaka, before commencement. Written consent was obtained from all participants before initiating data collection. According to the inclusion criteria, this study enrolled patients aged 18 years or older who provided consent and agreed to participate, exhibited clinical features of stroke confirmed by a computed tomography scan indicating hemorrhagic stroke, and experienced their first hemorrhagic stroke event. Exclusion criteria included patients who declined participation, those with intracranial space-occupying lesions presenting with stroke-like symptoms, infectious diseases affecting the brain and meninges, and patients diagnosed with ischemic stroke. Data analysis was performed using MS Office tools.

RESULT

The mean ± SD age of our participants was 50.33 ± 8.93 years. One-third (33.3%) were in the 40-50 years' age group, followed by nearly one-fourth (26.7%) in the 50-60 years' age group. Most of the participants had attained education up to various levels, with only 13.3% being illiterate. In this study, the gender distribution of the patients revealed that out of 60 patients, 45 (75.0%) were male and 15 (25.0%) were female, resulting in a male-to-female ratio of 3:1. It was found that 60.0% of cases had a monthly family income of more than 10,000 BDT, followed by 26.7% of cases with a monthly income within the range of 5000 to 10,000 BDT, and 13.3% of cases had a monthly family income ≤5000 BDT. In this study, 36.7% reported a family history of hypertension, 30.0% diabetes mellitus, 16.7% ischemic heart disease, and 13.3% stroke. Participants presented with varied complaints at the onset of illness, with 28.3% experiencing symptoms during sleep, 20% during work, and 15% during excitement. A significant proportion, 58.3%, reported a sudden onset of symptoms, while others (41.7%) described a gradual onset. Most participants (66.7%) presented conscious, while 16.7% were drowsy, and 8.3% were unconscious, with another 8.3% initially unconscious but later regained consciousness. In terms of comorbidities, 40.0% had hypertension, 30.0% had diabetes mellitus, 13.3% had ischemic heart disease, 28.3% had hyperlipidemia, and 8.3% were obese. The symptoms reported by the patients were as follows: headache (66.7%), vertigo (28.3%), nausea (41.7%), vomiting (16.7%), visual disturbance (25.0%), and seizure (20.0%). In the neurological examinations, findings showed that two-thirds (66.7%) of participants were oriented, while one-third (33.3%) were not oriented. Normal level of consciousness was observed in 66.7% of cases, with Grade I in 21.7%, Grade II in 3.3%, Grade III in 5.0%, and Grade IV in 3.3% of cases. Speech was normal in 70.0% of cases. Dysarthria was present in 8.3% of cases, and dysphasia in 13.3% of cases. Memory impairment was noted in 10.0% of patients. Most patients (91.7%) had normal muscle bulk, while 8.3% presented with wasted muscle. Muscle tone was normal in 13.3% of cases, hypertonic in 80.0% of cases, and hypotonic in 6.7% of cases. According to the CT findings, among 60 patients with hemorrhagic stroke, 51.7% had right-sided intracerebral hemorrhage, 40.0% had left-sided intracerebral hemorrhage, 5.0% had pontine hemorrhage, and 3.3% had brainstem hemorrhage.

Table 1: Age distribution of participants

Age (Years)	n	%
30-40 Yrs.	12	20.0%
40-50 Yrs.	20	33.3%
50-60 Yrs.	16	26.7%
60-70 Yrs.	8	13.3%
>70 Yrs.	4	6.7%
Mean ±SD	50.33±8.93	

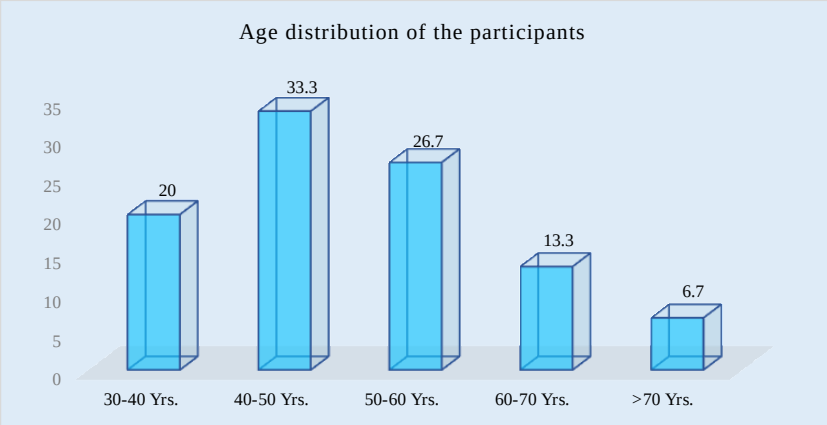

Figure I: Column chart showed age wise participants distribution (N=60)

Table 2: Distribution of educational status

Education	n	%
Illiterate	8	13.3%
Primary	10	16.7%
SSC	15	25.0%
HSC	15	25.0%
Graduate & above	12	20.0%

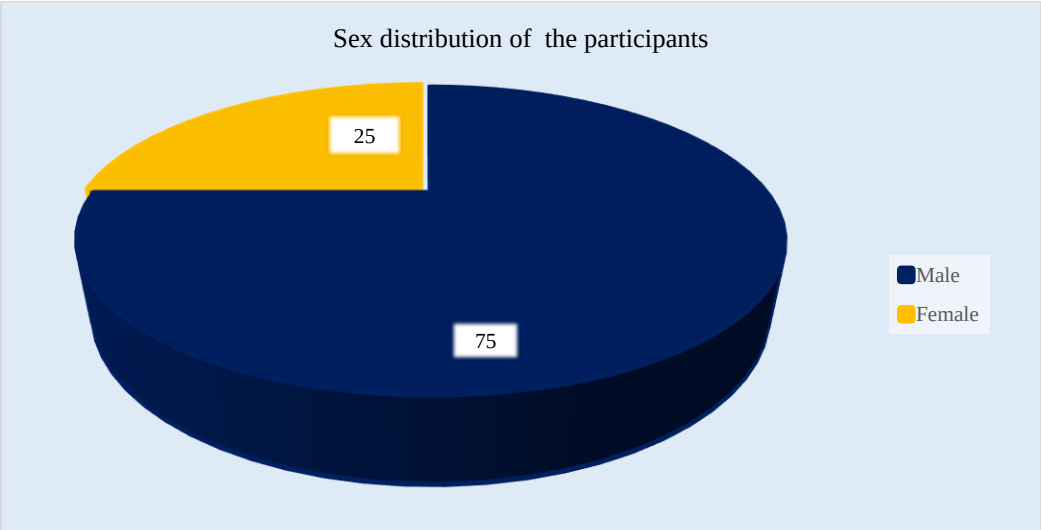

Figure II: Pie chart showed gender wise participants distribution (N=60)

Table 3: Monthly family income

Income	n	%
<5000 BDT	8	13.30%
5000-10000 BDT	16	26.70%
>10000 BDT	36	60%

Table 4: Distribution of family history

Family history	n	%
Hypertension	22	36.7%
Diabetes mellitus	18	30.0%
Ischemic heart disease	10	16.7%

Stroke	8	13.3%

Table 5: Presenting complaints

Complaints	n	%
Onset of illness		
Sleep	17	28.3%
Work	12	20.0%
Excitement	9	15.0%
Rest	10	16.7%
Eating	5	8.3%
Others	7	11.7%
Mode of onset		
Sudden	35	58.3%
Gradual	25	41.7%
Level of consciousness		
Conscious	40	66.7%
Drowsy	10	16.7%
Unconscious	5	8.3%
Unconscious but recovered	5	8.3%

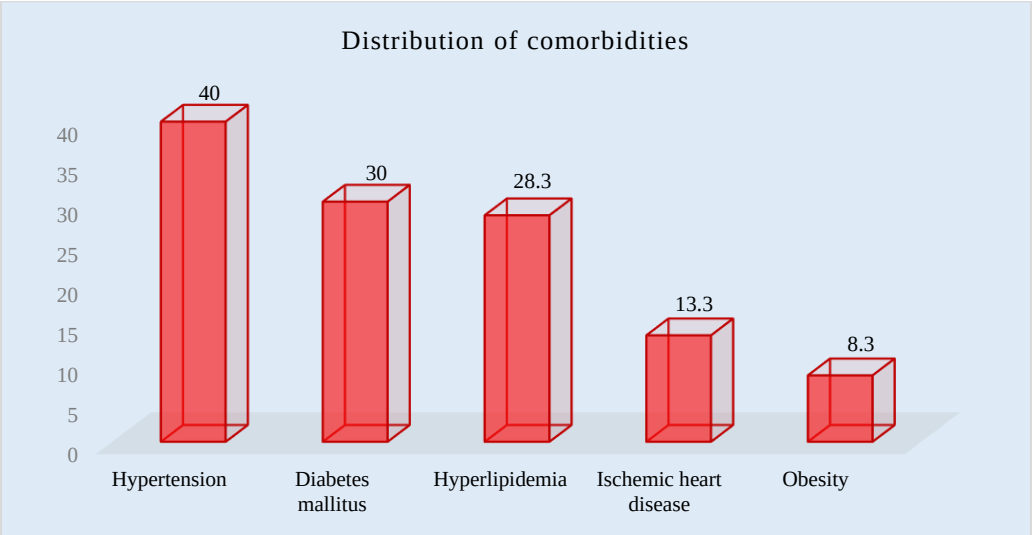

Figure III: Column chart showed comorbidities of the participants (N=60)

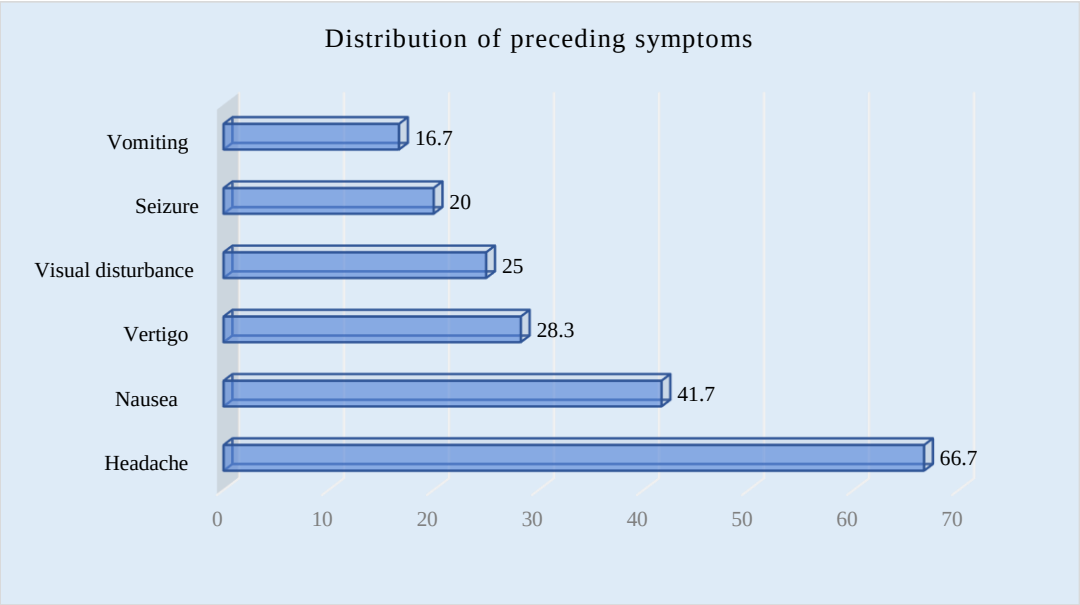

Figure IV: Bar chart showed preceding symptoms of the participants (N=60)

Table 6: Neurological findings

Findings	n	%
Higher psychic function		
Orientated	40	66.7%
Not orientated	20	33.3%
Level of consciousness:		
Normal	40	66.7%
Grade I	13	21.7%
Grade II	2	3.3%
Grade III	3	5%
Grade IV	2	3.3%
Speech		
Normal	42	70%
Dysarthria	5	8.3%
Dysphasia	8	13.3%
Memory impairment		
Impair	6	10%
Not impair	49	81.7%
Motor functions		
Bulk of the muscle		
Normal	55	91.7%
Wasted	5	8.3%
Muscle tone		
Normal	8	13.3%
Hypertonic	48	80%
Hypotonic	4	6.7%

Table 7: Findings of CT scan of the head

CT findings	n	%
Right-sided ICH	31	51.7%
Left-sided ICH	24	4.0%
Pontine hemorrhage	3	5.0%
Brain stem hemorrhage	2	3.3%

DISCUSSION

In our study of 60 patients with hemorrhagic stroke, the distribution by age showed that 20.0% were aged 30-40 years, 33.3% were aged 40-50 years, 26.7% were aged 50-60 years, 13.3% were aged 60-70 years, and 6.7% were above 70 years. The mean age was 50.33 ± 8.93 years. Comparatively, another study [11] indicated that 94% of patients were above 40 years old, with a peak incidence between 51 to 70 years (69%). Regarding educational levels in our study, 13.3% of patients were illiterate, 16.7% had primary education, 25.0% had completed SSC (Secondary School Certificate), another 25.0% had completed HSC (Higher Secondary Certificate), and 20.0% were graduates or above. In another study by Hart et al. [12], it was found that men who left full-time education at the age of 16 years or below had a significantly higher rate of stroke. In our study of 60 patients, we observed that 75.0% were male and 25.0% were female, resulting in a male-to-female ratio of 3:1, similar to findings by Chowdhury et al. [13]. Regarding family income distribution in our study, 60.0% of cases had a monthly family income of more than 10,000 BDT (Bangladeshi Taka), followed by 26.7% within the range of 5,000 to 10,000 BDT, and 13.3% had a monthly family income ≤5,000 BDT. In this study, the findings are consistent with Chapman et al. [14], which showed a higher incidence of stroke among the high-income group. Regarding family history in our study of hemorrhagic stroke patients, 36.7% had a family history of hypertension, 30.0% had a family history of diabetes mellitus, 16.7% had a family history of ischemic heart disease, and 13.3% had a family history of stroke. Another study [15] found that a positive family history of stroke was noted in 24.5% of patients. Regarding preceding symptoms in our study, the distribution showed that headache, vertigo, nausea, vomiting, visual disturbance, and seizures were reported in 66.7%, 28.3%, 41.7%, 16.7%, 25.0%, and 20.0% of patients, respectively. In our analysis of comorbidities among 50 patients with hemorrhagic stroke, 40.0% had hypertension, 30.0% had diabetes mellitus, 13.3% had ischemic heart disease, 28.3% had hyperlipidemia, and 8.3% were obese. Hayee et al. [16] found a similar prevalence of hypertension (52.11%) in their study, while another study among diabetic stroke patients reported hypertension in 50.3% of cases [17]. Regarding preceding symptoms in our study, the distribution showed that headache, vertigo, nausea, vomiting, visual disturbance, and seizures were reported in 66.7%, 28.3%, 41.7%, 16.7%, 25.0%, and 20.0% of patients, respectively. Neurological examinations revealed that two-thirds (66.7%) of participants were oriented, while one-third (33.3%) were not oriented. In our study, consciousness levels were distributed as follows: normal in 66.7% of cases, Grade I in 21.7%, Grade II in 3.3%, Grade III in 5.0%, and Grade IV in 3.3%. Speech was normal in 70.0% of cases, while 8.3% had dysarthria and 13.3% had dysphasia. Memory impairment was noted in 10.0% of patients. Muscle bulk was normal in 91.7% and wasted in 8.3%. Muscle tone was normal in 13.3%, hypertonic in 80.0%, and hypotonic in 6.7% of cases. In another study [18], acute headache and agitation were reported as the most common manifestations, present in 27.8% and 27.6% of patients, respectively. It was observed in our study that eye gaze impairment was present in 17.7% of patients, seizures in 5%, and gradual headaches in 3.8%. During pupil examination, mydriatic pupils were observed in 44.3% of patients, while miosis was seen in only 0.4% of patients. Regarding CT findings in our study, out of 60 patients with hemorrhagic stroke, 51.7% had right-sided intracerebral hemorrhage, 40.0% had left-sided intracerebral hemorrhage, 5.0% had pontine hemorrhage, and 3.3% had brainstem hemorrhage. In a previous study [11], it was found that 61% of studied patients had ischemic stroke, while 39% had hemorrhagic stroke. Hemorrhagic stroke has also been reported in Singapore and Malaysia at a rate of 33% [19].

LIMITATION OF THE STUDY

The study was conducted over a brief period due to time constraints. Participants were recruited exclusively from a single hospital in Dhaka city, potentially limiting the generalizability of the findings to a broader population. Additionally, a small sample size was another notable limitation of this study.

CONCLUSION

Older adults are particularly susceptible to hemorrhagic stroke, often experiencing a sudden onset of symptoms, with headaches being the most common complaint. In many cases, patients maintain normal levels of consciousness, speech, muscle tone, and muscle bulk. These characteristics underscore the variability in presentation and severity of hemorrhagic stroke in older populations. Prompt recognition of symptoms and immediate medical intervention are crucial to mitigate potential complications and improve outcomes for affected individuals. Continued research and advancements in stroke management are essential to enhance treatment strategies and reduce the burden of hemorrhagic stroke among older adults.

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