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Socio-demographic and Clinical Profile of Neurological Patients in Chittagong Medical College & Hospital in Bangladesh

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Abstract **Original Research Article**

Background: Globally, neurologic disorders are very common and describe a significant public health problem. Innovative strategies are needed to cease the progression of the neurologic epidemic in resource-poor settings in Bangladesh. Clear concept of socio-demographic and clinical profile of neurological patients may be helpful in the management of such patients. But in Bangladesh, we have very limited research-based data regarding these issues. aThe aim of this study was to form the socio-demographic and clinical profile of neurological patients. ***Methods:*** This was a prospective observational study which was conducted from January 2021 to June 2021 by consecutive sampling technique on the patients admitted to the adult Neurology unit of Chittagong Medical College & Hospital, Bangladesh. For this intervention, the ethical clearance was obtained from BMRC. Data were collected and recorded from appropriately consented cases by maintaining confidentiality by face-to-face interviews (or from attendants if the patient cannot respond appropriately), laboratory data from hospital records and pre-hospital treatment from previous records with the patient. All data were cleaned and analyzed by SPSS version 22.0 and presented in tables. ***Results:*** In this current study, among total participants, 53% were male and 47% were female. Most of our participants were educated up to SSC level (50%) and the majority of them were Muslims (84%). The mean ±SD age of the participants was 55±0.73 years and most of them were from rural areas (74%). Among total acute confusional state patients (6%), the most common presenting symptom was decreased alertness: 88%. Among 74% stroke patients, 5% cases with CNS infections and among 15% patients with other diseases, the most frequent presenting symptoms were muscle weakness in 90%, decreased alertness in 68% and again decreased alertness in 52% respectively. In this study, majority of the patients had a stroke (74%), followed by others: 58 (10%), acute confusional state: 33 (6%), diseases of the spinal cord: 16 (3%), peripheral neuropathy: 14 (2%), psychiatric disorder: 11 (2%), neurodegenerative disorder: 8 (2%). ***Conclusion:*** The frequencies of neurological diseases among male population are generally higher than that in female. Stroke may be considered as the most frequent disease among total neurological patients. Decreased alertness and muscle weakness are two most common symptoms of neurological patients.

Keywords: Sociodemographic, Clinical profile, Neurological patients, Neuropathy, CNS.

1. INTRODUCTION

The rising neurological disease burden and the damaging consequences on individuals, families, and populations require urgent attention. Innovative strategies are needed to halt the progression of the neurological epidemic in resource-poor settings in Bangladesh. To address the socioeconomic differentials in the burden of disease and healthcare needs of Bangladeshis, more resources need to be directed toward applying the existing knowledge base to tackle the neurological epidemic in policy, programs, capacity building, and research arenas. Globally, neurological diseases are considered as some major causes for disabilities. Approximately 15% of the population is living with some form of disability globally [1]. Persons with neuropsychiatric disorders account for large proportion of global burden of disease and disability [2]. Neurological disorders and some of the other

conditions with Neurological impairments and squeal constitute over 6% of the global burden of disease, and this burden is especially high in many low and middle-income countries [3]. It is very obvious that, stroke remains the most frequent cause of neurologic admissions and mortality [4]. Stroke and CNS infections were the most prevalent neurological disorders identified. Ekenze *et al.,* have found that, neurological admissions comprise about 14.8% of medical admissions; furthermore, the spectrum of neurological diseases are stroke 64.9%, central nervous system infections (21.8%), HIV related neurological diseases (3.5%), hypertensive encephalopathy (3.4%), dementia (3%), subarachnoid hemorrhage (2.2%), Guillian Barre syndrome (1.2%), Parkinson's disease (1.1%), myasthenia gravis (1.0%), motor neuron disease and peripheral neuropathy and accounted for 0.8% and 0.6% respectively [5]. Noninfectious diseases accounted for 78.2% of neurological admissions, while infectious diseases accounted for 11.8% [6]. According to the recently published Global Burden of Disease 2010 Study (GBD 2010), stroke is the second leading cause of death globally and the third leading cause of premature death and disability as measured in DALY [7]. Neurology is introduced as a specialty in Bangladesh during the 1960s'. An excess burden of cerebrovascular disease and stroke denotes a higher risk of mortality and morbidity in Bangladesh [8]. However, rigorous population-based epidemiologic studies are needed in many resource-constrained countries to better target solutions.

2. METHODOLOGY

This was a prospective observational study which conducted from January 2021 to June 2021 by consecutive sampling technique on the patients admitted to the adult Neurology unit of Chittagong Medical College & Hospital, Bangladesh. Ethical clearance was obtained from BMRC. The whole intervention was conducted in accordance with the principles of human research specified in the Helsinki Declaration [9] and executed in compliance with currently applicable regulations and the provisions of the General Data Protection Regulation (GDPR) [10]. Obeying inclusion as well as exclusion criteria of this study in total 584 cases were enrolled as the study population. For ease of implementation, it was planned to recruit all consecutive cases admitted in a day (8 am to 8 pm), two days a week, in the study hospital for 8 weeks. The days were selected purposively to match the date of admission days of the co-investigators. Recruiting all cases over a period was not feasible, considering the volume of cases. After obtaining the study approval (ethical & study hospital administration), three dedicated research assistants (RAs) were recruited for the study hospital. A daylong training and coordination meeting of the investigators were organized to bring uniformity in data collection & study procedures. In cases unable to respond or seriously ill, information was collected by interviewing the closest person accompanying the case. For some of the cases, study procedures were completed the following day. Diagnosis was recorded from the case management file in the hospital or if missing for any reason, was recorded at discharge or death. All data were processed, analyzed and disseminated by using MS Excel and SPSS version 22.0 program as per necessity.

3. RESULT

In this current study, among total participants, 53% were male and the rest 47% were female. Most of our participants were educated up to SSC level (50%), followed by no schooling: 43% and above SSC level: 7%. The majority of the participants were Muslims (84%). The mean ±SD age of the participants was 55±0.73 years. The median (Mean ±SD) age of all the male participants was 55± 0.96 years and females were of 52±1.11 years. Most of the participants were from rural areas (74%) and 24% of them were from urban areas. It appears that, the median monthly family income of the female participants was 20,000 BDT and in male participants it was 14,500 BDT. In this study, among total acute confusional state patients (6%), the most common presenting symptom was decreased alertness: 88%, followed by dizziness: 45%, vomiting: 42%, partial or complete loss of sensation: 36%. In 432 (74%) stroke patients, the most frequent presenting symptom was muscle weakness: 90%, followed by slurred speech: 68%, dizziness: 44%, decreased alertness: 31%, vomiting: 28%, etc. In patients with CNS infections 28 (5%), the most common symptom was decreased alertness: 68%, followed by headache: 61%, vomiting: 60%, seizures/epilepsy: 43%, partial or complete loss of sensation: 36%, etc. Among the patients with other diseases 15%, the most frequent symptom was decreased alertness: 52%, followed by muscle weakness: 39%, headache: 22%, dizziness: 22%, slurred speech: 22%, vomiting: 22%, seizures/epilepsy: 13% etc. The results showed that, majority of the patients had a stroke (74%), followed by others: 58 (10%), acute confusional state: 33 (6%), diseases of the spinal cord: 16 (3%), peripheral neuropathy: 14 (2%), psychiatric disorder: 11 (2%), neurodegenerative disorder: 8 (2%).

Table 1: Socio-demographic characteristics of participants (N=584)

Variable	**n/N (%)**
Male sex	308/584 (53)
Level of Education	
No schooling	251/584 (43)
Up to SSC	295/584 (50)
Above SSC	38/584 (7)
Religion	
Islam	488/584 (84)
Others	96/584 (16)
Age: Median (Mean ± SE)	
Total	60 (55±.73)
Male	60 (57±.96)
Female	55 (52±1.11)
Residence n/N (%)	
Urban	139/584 (24)
Rural	431/584 (74)
Family Income: Taka/month (Range)	
Male	Tk 14500 (0-150000)
Female	Tk 20000 (0-150000)

Table 2: Frequency of presenting symptoms in major disease categories (N=584)

Symptoms	**Acute confusional state**	**In stroke**	**CNS infections**	**Other diseases**
	n/N (%)	n/N (%)	n/N (%)	n/N (%)
Total Number of Cases	33/584 (6)	432/584 (74)	28/584 (5)	91/584 (15)
Muscle weakness	8/33 (25)	386/432 (90)	5/28 (19)	9/23 (39)
Headaches	10/33 (30)	59/432 (14)	17/28 (61)	5/23 (22)
Unexplained pain	4/33 (12)	18/432 (4)	1/28 (4)	2/23 (9)
Vomiting	14/33 (42)	126/432 (28)	17/28 (60)	5/23 (22)
Dizziness	15/33 (45)	192/432 (44)	8/28 (28)	5/23 (22)
Slurred Speech	11/33 (32)	283/432 (68)	6/28 (21)	5/23 (22)
Change in Vision	3/33 (9)	11/432 (3)	2/28 (7)	0/23 (0)
Tremors	1/33 (3)	5/432 (1)	1/28 (4)	0/23 (0)
Decreased alertness	28/33 (88)	135/432 (31)	19/28 (68)	12/23 (52)
Seizures/epilepsy	5/33 (15)	19/432 (4)	12/28 (43)	3/23 (13)
Partial/complete sensation loss	12/33 (36)	44/432 (10)	10/28 (36)	1/23 (4)

Table 3: Frequency of diseases categorized by disease syndromes (N=584)

Variable	**Total cases**
	n/N (%),
Total Number of Cases	584/584 (100)
Stroke	432/584 (74)
Acute confusional state	33/584 (6)
Peripheral/Cranial neuropathy	14/584 (2)
Demyelinating diseases	5/584 (1)
Diseases of spinal cord	16/584 (3)
Neurodegenerative disorder	8/584 (2)
Psychiatric disorder	11/584 (2)
Parkinsonism/other movement disorders	7/584 (1)
Others	58/584 (10)

4. DISCUSSION

The aim of this study was to form the socio-demographic and clinical profile of neurological patients. In this cohort of 584 cases admitted to the adult Neurology unit of a tertiary Health Care facility of Bangladesh, we have found stroke cases represent the commonest neurological condition requiring hospitalization (74%). The users of hospital care in a tertiary care setting are from the low socioeconomic status populations. The other common conditions requiring hospitalization were acute confusional state followed by CNS infections. The results should be taken into account when debating health policy, health

systems, and allocation of resources to healthcare and research, as well as being determinators for education on all levels. Stroke is the third leading cause of death in Bangladesh. The high number of disability-adjusted life-years lost due to stroke (485 per 10,000 people) show that stroke severely impacts Bangladesh's economy [11]. Neurological disorders are the leading cause of disability and the second leading cause of death worldwide [12]. Very few studies have been conducted within community settings to characterize the burden of neurological disorders [13] where tremors, headache, stroke, peripheral polyneuropathy, and upper limb mononeuropathy were prevalent among the elderly population. Hence it is not surprising that stroke is the commonest neurologic disorder in our cohort. Stroke patients were relatively younger compared with those in developed countries. Nearly 7% of patients presenting with stroke for admission succumbed, and that the majority of stroke survivors are discharged with severe functional limitations [14]. Chowdhury RN *et al.,* reported that stroke was the most common condition (47.5%) observed at referral, followed by seizure (9.3%), disease of the spinal cord (7.8%), and encephalopathy (6.3%) [15]. We found that, in stroke patients, mainly commonly present symptoms were muscle weakness, followed by slurred speech, dizziness, decreased alertness, vomiting. Our study reveals that most of the cases had a stroke, followed by acute confusional state and other diseases, peripheral neuropathy, and spinal cord diseases. It is similar to the study by Feigin *et al.,* reported that stroke was the major contributor of neurological DAILYs (42.2%) among the four most significant contributors of neurological DALYs followed by migraine (16.2%), Alzheimer's, and other dementias (10.4%), and meningitis (7.9%) [16]. The high frequency of stroke in developing countries might be accounted for by the increasing prevalence of the traditional risk factors like hypertension (which increases with age), diabetes mellitus, hyperlipidemia, and smoking, as a more urbanized lifestyle is being adopted [17]. We found that in the case of stroke patients most frequent risk factors were diabetes mellitus, smoking, sedentary lifestyle. In acute confusional state, the most frequent risk factors were diabetes mellitus, followed by smoking. The mean ±SD of the age of the participants was 55±.73 years. The majority (74%) originated from rural areas. About 85% of the patients had a history of hypertension prior to their stroke. There is a high modifiable burden of risk factors for adult stroke deaths in rural Bangladesh, most notably including hypertension [18]. There is a high modifiable burden of risk factors for adult stroke deaths in rural Bangladesh, most notably including hypertension. Betel consumption may be an under-recognized risk factor for stroke death [18]. Only 16 (2.4%) died during treatment, but most of the patients had moderate to severe disability at discharge. [19] Specialized medicine in general and Neurology, in particular, is unlikely to get a substantial budget increase and attention in the immediate future in Bangladesh, as primary care is still not ensured in many parts of Bangladesh. This makes it necessary to reflect on how better we can meet the challenges with the available resources.

Limitation of the Study

This was a single centered study with small sized samples. Moreover, the study was conducted at a very short period of time. So, the findings of this study may not reflect the exact scenario of the whole country.

5. CONCLUSION & RECOMMENDATION

The frequencies of neurological diseases among male population are generally higher than that in female. Stroke may be considered as the most frequent disease among total neurological patients. Decreased alertness and muscle weakness are two most common symptoms of neurological patients. For getting more specific results, we would like to recommend for conducting similar more studies in several places with larger sized samples.

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