Original Articles

Delay in Hospital Arrival of Stroke Patients: An Observational Study

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Abstract:

Introduction: Stroke is the leading cause of disability among adults globally. The importance of early intervention is well known to prevent permanent disability and mortality otherwise caused by the ischemic stroke or hemorrhagic stroke.

Objective: Aims of this study are to assess the level of pre-hospital delay and reasons for such delay in acute stroke patients.

Methods and Materials: An observational study was carried out in the Department of Medicine, Dhaka Medical College Hospital between December 2012 to January 2013 among stroke patients (Age greater than 18 years, both gender, with Clinical features and neuroimaging findings consistent with stroke). The questionnaire regarding patient's age, sex, occupation, presenting symptoms, associated disease like DM, HTN etc., duration of symptoms, mode of transportation, type of consultation sought, causes of delay, their socio-economic status were filled up by investigator.

Result: In our study out of 100 patients 55 (55%) had ischaemic stroke and 45 (45%) had haemorrhagic stroke. The median delay from onset of symptoms to hospital arrival was 6 hours. The main cause of delay in reaching hospital was identified as indecision (40%). The other causes include financial constrain (30%), non-availability of transport (22%), traffic jam (10%), lack of manpower (20%) and consultation with rural medical practitioners (30%).

Conclusion: Early intervention is very important to prevent permanent disability and mortality in case of stroke. So, it is important to take necessary steps to raise awareness among health care professionals and general population reagarding handling stroke patients and sending them to specialized hospitals where adequate facilities are present.

Keywords: Stroke, ischaemic stroke, intracranial haemorrhage, delay is arrival.

Introduction:

Stroke is a leading cause of mortality of disability of adults in developed and developing countries.[1] 'It has been defined as a clinical syndrome characterized by rapidly developing clinical symptoms and/or signs focal and at times global loss of brain function with symptoms lasting greater than 24 hours or leading to earlier death and with no apparent cause other than that of vascular origin.[2] Despite advances in preventive strategies and initial therapy, nearly 800000 strokes occur per year in the United States. 87% of all strokes worldwide are ischaemic in origin.[3] It is also one of the leading causes of death and disability in Bangladesh. There has been limited progress in the management of stroke patients in developing countries and data on stroke care in these countries are sparse.[4,5,6] The importance of early intervention (such as tissue plasminogen activator (rt-PA) within three hours of onset of ischaemic stroke or surgical intervention in hemorrhagic stroke) is well known to prevent permanent disability and mortality otherwise caused by stroke.[7,8,9,10]

The human nervous system is rapidly an irretrievably lost as stoke progresses and therapeutic intervention should be pursued as soon as possible.[11] Thrombolytic therapy for ischaemic stroke is a very promising treatment if it is given

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in time. The therapeutic window is less than three hours and best results can be achieved with administration within 90 minutes.[3] However it has been seen that patients with acute stroke are often admitted late and therefore unable to receive thrombolytic therapy.[11]

As effective treatment for acute ischaemic stroke is available, it is important to analyze the factors that are responsible for the delay.

Factors like live alone, referral pattern, contact with local doctors, availability of the transport option, nocturnal onset are responsible for delay in hospital arrival in case of western studies.[5,6]

On the other hand studies on intracranial hemorrhage (ICH) had shown a good long term outcome if performed within 3 to 7 hours. In one study where craniotomy was done within three hours of onset by a transsylvian or transtemporal approach based on the size and site of hemorrhage, 15% had full recovery while 35% were living independently.[19,20]

Thrombolysis is still under used in our country. There is no stroke monitoring service or database. Purpose of this study is to assess the level of pre-hospital delay and reason for such delay in acute stroke patients. Results from this study will likely to be helpful to the decision makers of health sectors in Bangladesh for the development of a model for stroke health care, to create stroke awareness among Bangladeshi people and to take primary steps for initiation of possible early intervention.

Methods and Materials:
An observational study was carried out among stroke patients admitted between December 2012 to January 2013 in the Department of Medicine, Dhaka Medical College Hospital. All patients are of both gender, age greater than 18 years with symptoms of stroke and neuroimaging(CT/ MRI) finding are consistent with stroke were included. Patients in- hospital stroke were from excluded from this study. The questionnaire documented the patients age, sex, occupation, presenting symptoms, associated disease like DM, HTN etc. duration of symptoms, mode of transportation, type of consultation sought, causes of delay, their socio-economic status, confirmed diagnosis and opinion regarding treatment.

Delay was considered if the time of arrival at medicine ward more than three hours from the time of onset of symptoms. Time of stroke onset was defined as the time patients or an observer first noticed a neurological deficit. If the symptoms were present on awakening it was assumed at stroke had occurred during sleeping and the time of onset was taken when patient was last seen without symptoms.

Data was analyzed using SPSS version 19. Descriptive statistics, frequencies and percentages were calculated for variables such as type of stroke, time of onset of stroke (am, pm), time of arrival to hospital after development of symptoms (arriving late or in time). Mean +SD were used for continuous variable such as age of the patient.

Result:
During the one month observational period 100 stroke patients admitted in the Department of Medicine were included. Among them 57 (57%) were male and 43(43%) were female. The mean age of the patients was 58.68 ± 13.689. Of this 100 patients 55(55%) had ischaemic stroke and 45(45%) had haemorrhagic stroke (Fig-1).
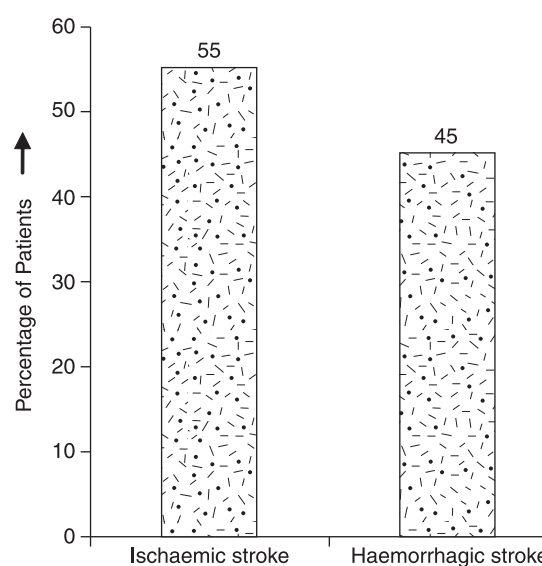


Fig.-1: *Type of Stroke*

The median delay from onset of symptoms to hospital arrival was 6 hours. Only 12% of the patients reach to hospital within 3 hours. 88 % of the patients reach hospital after 3 hours (17% reach within 6 hours, 23% within 9 hours, 30% within 24 hours, 18% after 24 hours and 2% after 48 hours) (Fig-2).

The main cause of delay in reaching hospital was identified as indecision (40%). Another very important factor is the referral pattern (30%). Patients who came to hospital after three hours,among them 30%contact with GP (General Practitioner)/ village doctors (non-registered practitioners)/local pharmacies and then came to hospital. Inability of the patients' attendant to identify symptoms of stroke was cause of delay in case of 32% patients. Some of the patients were delayed in reaching hospital because of multiple reasons. The other causes include financial problem (30%), non-availability of transport (22%),

traffic jam (10%), lack of manpower (20%) and consultation with village doctor(30%) (Fig-3).
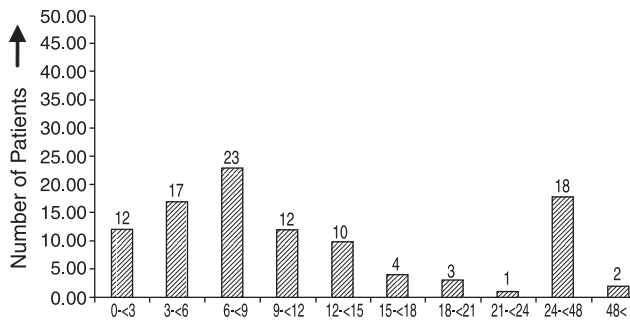

Fig.-2: *Time interval between onset of symptoms & reaching hospital(In hours).*
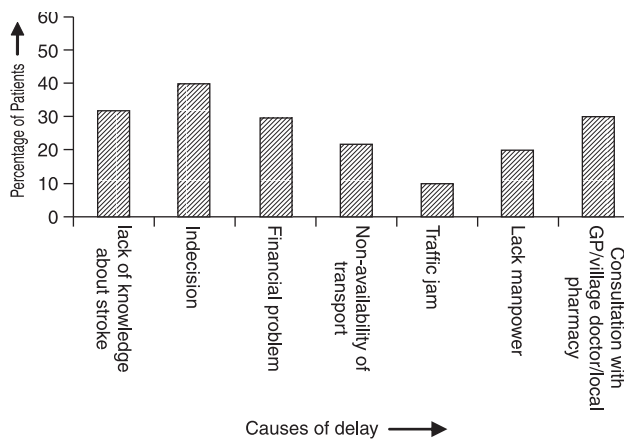
Fig.-3: *Causes of delay in reaching hospital (in %).*

Regarding the mode of transport, only 20% of the patients used ambulance as transport. Majority patients used microbus (30%) as a mode of transport while other came by CNG, bus, car, boat, launch or rickshaw. Multiple transports were used by a singlepatient to reach hospital. (Fig-4).
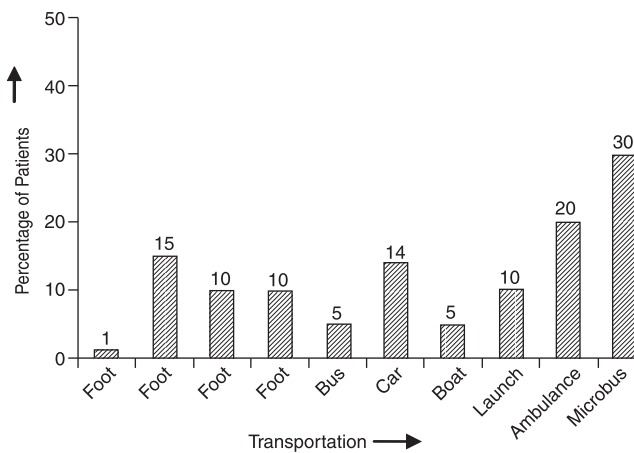
Fig.- 4: *Mode of transport*

Discussion:

Majority of the studies that have focused on delay in seeking treatment among stroke patients have revealed that median delay time ranged from 3 - 6 hours. Delay in arrival was not only caused by organizational, educational and demographic factors but also by perceptual, social and behavioral factors.[12] Our study revealed that only 12% of the stroke patients came to hospital within 3 hours and another17% of the patient came within 3- 6 hours, which is similar to studies performed in other countries like India & China.[13,14]

In 40% of our patient the major problem was taking a decision regarding what to do next with the stroke patient. The major concern sometimes was where to take the patient and whether taking the patient would do any help? In our study, 30% of the stroke patients who reached hospital after three hours had contacted with GPs (General Practitioners), village doctors (Non-registered practitioners) or local pharmacies in first place causing significant delay. This is also seen in other studies conducted in countries like India and Taiwan.[13,15] Therefore it is important to organize continuous medical education for health care professionals to increase awareness of importance of patients transfer to an organized stroke centre. Our study also suggested that patient's attendants perception of severity of symptoms or lack of knowledge about stroke influences the reaction time. 32% of our patients have low perception or lack of knowledge about stroke. So it is important to take necessary steps to raise awareness among both health care professionals and general population about handling stroke patients and sending the patients to a specialized hospital where adequate facilities are present as soon as possible after initial diagnosis or recognition of the symptoms.

Lack of adequate transport facility is another important factor behind the delay. Only 20% of the patients came to hospital by ambulance where 80% of the patients were brought to the hospital by other transports like bus, microbus, boat, launch and even rickshaw.

Patient's gender, age, type of stroke and occupation was not associated with delay which is similar to findings in other studies.[16, 17, 18]

Conclusion:

Main target of our study was to identify the factors responsible for delay in reaching hospital in case of stroke patients. We have found that the main reason behind this, is the inability to identify the symptoms of stroke, contact with a local doctor/village doctor, indecision and lack of transport facilities. We believe that result of this study will help in formulating national guideline of stoke. Awareness raising

programs, training on stroke management for health personnel and general people will certainly help to improve the current scenario. Transport facilities should also be improved to reduce delay in hospital arrival.

Disclosures

We have no conflict of interest.

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