A STUDY TO DETERMINE THE FACTORS ASSOCIATED WITH HOSPITAL ARRIVAL TIME FOR STROKE PATIENTS IN SCTIMST

PROJECT REPORT

Submitted in partial fulfillment of the requirements

For the

Diploma in Neuro Nursing

SUBMITTED BY

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Code No: 6212

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November 2011

CERTIFICATE FROM SUPERVISORY GUIDE

This is to certify that **Ms. Remya S. S** has completed the project work on **'Factors associated with hospital arrival time for stroke patients'**, under my direct supervision for the partial fulfillment for the Diploma in Neuro Nursing in the university of Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum. It is also certified that no part of this report has been included in any other thesis for processing any other degree by the candidate.

Trivandrum
November 2011

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This is to certify that Miss. **ATHULY A. A** has completed the project work on "**A STUDY TO DETERMINE THE FACTORS ASSOCIATED WITH HOSPITAL ARRIVAL TIME FOR STROKE PATIENTS IN SCTIMST** "under my direct supervision and guidance for the partial fulfillment for the **"DIPLOMA IN NEURONURSING** "in the University of Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum. It is also certified that no part of this report has been included in any other thesis for procuring any other degree by the candidate.

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APPROVAL SHEET

This is to certify that Miss **ATHULYA.A** bearing Roll No: 6213 has been admitted to the Diploma in Neuro Nursing in January 2011 and she has undertaken the project entitled **"A STUDY TO DETERMINE THE FACTORS ASSOCIATED WITH HOSPITAL ARRIVAL TIME FOR STROKE PATIENTS IN SCTIMST"** which is approved for the Diploma in Neuro Nursing awarded by the Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum, as it is found satisfactory.

Place:

Date:

Examiners

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Guide

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Athulya. A

ABSTRACT

Subject: A study to assess the knowledge regarding hyponatremia and its management among nurses working in NSICU in SCTIMST, Trivandrum.

Background: Nurses in most Neuro specialties are expected to have a sufficient knowledge about hyponatremia and its management.

Objectives: 1.To assess the knowledge regarding hyponatremia and its management among nurses working in NSICU, in SCTIMST, Trivandrum.2.To find out the variation in nurses knowledge in relation to the demographic variables.

Methods: 30 Neuro Nurses were purposively selected from NSICU of Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum. Convenient sampling technique was used for selecting the sample. Total period of the study was august 2011 to October 2011. A valid questionnaire was used, in the form of multiple choices**.**

Results: Study showed that Neuro Nurses have above average level of knowledge regarding hyponatremia and its management. There is no statistically significant difference between the mean knowledge score, age, qualification and experience.

Conclusion: Based on the findings of the study 93.3% of Neuro Nurses have above average level of knowledge regarding hyponatremia and its management.

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ABSRACT

Topic:A study to assess the factors associated with hospital arrival time for stroke patients

Background: Patients who experience a sudden ischemic stroke can benefit from administration of intravenous tissue plasminigen activator (tPA) to reduce the resulting disability, yet few arrive in time to be eligible for tPA administration**. Aim**: Aim of this study were (1) to identify the factors associated with hospital arrival time for stroke patients (2) to assess the influence of these factors in seeking medical attention for stroke patients. **Method**: A study was conducted in stroke ICU and general medical ward of Sree Chitra Tirunal Institute of Medical Sciences and Technology, Trivandrum. 30 patients were conveniently selected for this study. Total period of study was from September 2011 to October 2011. A self prepared questionnaire was used for data collection**. Results:** The study shows that lack of knowledge about warning signs of stroke, treatment, low threat perception, local doctor contact are associated with delay in arrival after stroke. **Conclusions:** Public education regarding warning signs, risk factors, treatment of stroke is very much necessary to reduce the resulting disability and to improve the outcome after stroke. In our country, due to large number of unqualified practitioners, and also ignorance of qualified practitioners to recruit the patients to comprehensive stroke care centre also resulted in delayed arrival. They also need to be educated to recruit the patient as early within the narrow therapeutic time window.

Chapter - 1

1.1 Introduction

Cerebrovascular disorders are an umbrella term that refers to any functional abnormality of the central nervous system that occurs when the normal blood supply to the brain is disrupted. Stroke is the primary cerebrovascular disorder in the world. According to WHO, stroke is the 3rd largest killer disease in India after heart attack and cancer. The incidence rate of stroke in India is 130/100,000/year. (www.world stroke.org 2009)

Stroke is a heterogeneous, neurological syndrome characterized by gradual or rapid, nonconvulsive onset of neurological deficits that fit into a known vascular territory and that last for 24 hours or more (Hickey 2003).

October 29th is celebrated as World Stroke Day every year. Theme for World Stroke Day 2009 was that "what can I do?" This theme was intended to improve public awareness. Everyone can do something to improve the stroke outcome and reduce the resulting disability. In 2010 the theme was "One in six, Act now". 1 in 6 people worldwide will have a stroke in their lifetime. Every 6 sec stroke kills someone. And in every other sec stroke attacks a person regardless of age or gender. 15 million people experience a stroke each year and 6 million of them do not survive. About 30 million people have had a stroke must have residual disabilities. Behind these numbers are real lives. (http://www.indg.in/health.)

Time to treatment is a critical factor in the outcome of patients with acute stroke who are treated with intravenous tissue plasminogen activator (t-PA). The longer the delay between symptom onset and treatment, the less likely it is that a patient will achieve a good clinical outcome. (Lansberg et al 2009). The benefit of intravenous thrombolytic therapy in acute brain ischemia is strongly time

dependent. Therapeutic yield is maximum in the first minutes after symptom onset and declines rapidly during the next 4.5 hrs. In the typical large artery ischemic stroke, for each minute that perfusion is delayed, 2 million nerve cells die. (Saver et al 2010).

There are several factors which influence the hospital admission for stroke patients. Studies had conducted in India as well as western countries to assess these factors. It has been shown that some factors help in early neurological attention and some in late. Researchers concluded that lack of public awareness about stroke, signs, symptoms and need for fast action will resulted in serious disability and poor outcome. (Yoon et al 2001, Williams et al 1997, Kothari et al 1997).

1.2 Background of the study

Over the last several years, advances have been made in the treatment of stroke. Early recognition and prompt entry into the stroke care unit are essential to reduce death and disability from stroke.

Stroke can be classified into two major categories: ischemic (85%), in which vascular occlusion and significant hypoperfusion occur, and hemorrhagic (15 %) in which there is extravasation of blood into the brain. (Brunner & suddarth 2009). Comparison of major type of stroke is given in Table1.1

An ischemic stroke is a sudden loss of function resulting from disruption of the blood supply to a part of brain. This event is usually the result of longstanding cerebrovascular disease. Early treatment with thrombolytic therapy results in fewer stroke symptoms and less loss of function (Brunner & suddarth 2009)

Table 1.1 Comparison of major types of stroke

Parameters	**Ischemic**	**Hemorrhagic**
Causes	Large artery thrombosis Small penetrating artery thrombosis Cardiogenic embolic Cryptogenic Other	Intracerebral hemorrhage Subarachnoid hemorrhage Cerebral aneurysm Arteriovenous malformation
Main presenting symptom	Numbness or weakness of the face, arm, or leg, especially on one side of the body	"Exploding headache" Decreased level of consciousness
Functional recovery	Usually plateaus at 6 months	Slower, usually plateaus at about 18 months

"FAST" is an excellent acronym to remember because early treatment of stroke is essential to reduce brain damage and mortality associated with stroke.(www.wisegreek.com/in)

F --- Face (Facial paralysis)

A --- Arm (Arm weakness)

S --- Speech (Speech difficulties)

T --- Time (Time to act fast)

If anyone of these symptoms present, then it should be considered as stroke and should act fast.

GIVE ME FIVE (www.usingenglish.com) is another method for checking whether someone is having a stroke is asking the patient to give you five.

WALK	--- Is there balance off?
TALK	--- Is there speech slurred or face droopy?
REACH	--- Is one side weak or numb?
SEE	--- Is their vision all or partly lost?
FEEL	--- Is there headache severe?

Sree Chitra Tirunal Institute for Medical Sciences and Technology, an institute of national importance has a 7-bedded comprehensive stroke care unit. It is a teritiary level hospital where patients are admitted by referral. Incase of acute stroke , patients can come without referral by contacting 0471-2524333. One bed is always kept ready for acute stroke. In case of ischemic stroke intravenous or intra arterial Thrombolysis is performed. Window period is within 4.5 hrs for IV thrombolysis and within 6 hrs for intra arterial. Various studies were conducted to assess the variables associated with hospital admission of stroke patients in India and other western countries. From this the investigator was interested to do a similar study in our institute and to assess whether public are aware about the emergence nature of stroke.

Recognition of stroke warning signs: Studies had found that people lack adequate knowledge regarding signs and symptoms of stroke. (Kothari et al 1997, Williams et al1997, Feldmann et al 1993)). Kothari et al(1997) found in their study that 39% of their population could not identify any single signs and symptoms of stroke. Williams et al 1997 found that 62% of their patients did not know the signs of a stroke. Unilateral weakness, numbness, and speech abnormality were the most common symptoms recognized as warning signs of stroke (Kothari et al 1997). Sudden confusion or trouble speaking or understanding speech were recognized as the most common symptom. (Maze & Bakas 2004). Signs and symptoms of severe stroke favored early hospital

arrival, whereas mild stroke often resulted in delayed presentation. (Lacy 2001 et al &Azzimondi 1997 et al). Srivastava 2001 et al found that 36 of 110 attendants of the patients had a significantly low threat perception. Though they recognized symptoms as stroke they thought it would resolve spontaneously and delayed hospitalization. Feldman et al1993 found that the recognition by patients or bystanders that an acute, stable deficit signified a stroke was associated with a more rapid presentation to a hospital.

Mode of transportation:

Free ambulance service is available by activating 108 in Kerala state. Studies had shown that patients arrived by ambulance presented in the hospital early than who arrived by private vehicle (Williams1997 et al, Maze 2004, Menon 1998 et al, Fussman2010 et al, Derexet al 2002). Derex et al 2002 found that early stroke unit admission in France is strongly associated with EMS and FD transport. The study showed that EMS was initially activated in 19% of cases, but EMS personnel were actually dispatched in only 15% of cases. French EMS professionals require increased awareness regarding the importance of urgent transport of acute stroke patients to a hospital with expert stroke care. The study also found that the use of EMS or FD transport is insufficient among French stroke patients (35% of cases). Menon et al 1998 found that delay time to ED arrival and to see a neurologist decreased with ambulance transport, patients transported b the EMS were seen faster by the ED physician. Maze et al 2004 found that those arriving by EMS and those who had reported their income was enough to make ends meet had shortest arrival times. Those with longest arrival times were those who arrived by private vehicle or taxi, and interestingly, those who perceived their income as comfortable. But Chang et al from Taiwan found that prehospital delay was not influenced by the use of EMS because of the extensive network of hospitals and clinics in the Taiwan area and the transportation time is minimal. Williams et al (1997) found that 81%of their early arrival (fewer than 3 hrs) entered the hospital by EMS, while only 38%of the late arrivals (longer than 3 hrs) entered the hospital through EMS.

Characteristics of initiator:

The initiator, or the person who makes the decision to seek hospital care based on the stroke warning signs, can be the patient, a family member, a coworker, or any other individual who sought hospital care for the patient. Identifying initiator characteristics is of prime importance in targeting educational efforts to the target public. Several studies have emphasized the role that family members play in seeking hospital care (Kothari et al 1997, Feldman et al 1993, Derex et al 2002, Harper et al 1992, Srivastava et al 2001, Maze et al 2004). Kothari et al 1997 found that stroke patients are much likely to use EMS if family member recognize the warning signs and family members are more apt to activate EMS than patients. Feldman et al 1993 found that the recognition by patients or bystanders that an acute, stable deficit signified a stroke was associated with a more rapid presentation. Derex et al 2002 through their study confirmed the finding that living alone increases admission time in acute stroke. Univariate analysis in their study showed that recognition of symptoms by bystanders significantly shortens the admission delay. Researchers also found that patients whose symptoms recognized by bystanders were >2 times more likely than patients who recognized their symptoms themselves. Harper et al 1992 found that patients living alone took significantly longer to get to a hospital than those living with spouses, relatives, or friends. Maze et al 2004 found in their study that 58% of the initiators were family members or others. In their study they found that category of the initiator (patient, family, other) was not significantly associated with hospital arrival time. Only initiator characteristic associated with hospital arrival time was perceived adequacy of income. Srivastava et al 2001 in their study found that 36 of 110 attendants of the patients had a low threat perception, though they recognized symptoms as stroke but thought it would resolve spontaneously.

In summary, the current literature documents that fewer than half of stroke patients arrive within 3-hour time window period needed for t-PA eligibility and those who arrive late often not arrived by ambulance. Studies also

have documented lack of public awareness of warning signs or need to seek medical attention once warnings are identified. In addition there is some evidence that certain initiator characteristics are associated with delayed arrival time. Because of the many factors associated with delayed arrival time, studies that document factors most associated with early arrival time are needed to identify priority ideas for intervention. The purpose of this study was to determine common factors associated with hospital arrival time for stroke patients and their influence in early and late arrival.

1.3 Need and significance of the study

Patients who experience a sudden ischemic stroke can benefit from administration of intravenous tissue plasminogen activator (tPA) to reduce the resulting disability, yet few arrive in time to be eligible for tPA administration. The manner in which a patient is referred and admitted to a hospital is closely related to the nature of the underlying diagnosis. Knowledge of the natural history of myocardial infarction and the value of coronary care units has prompted professional and public awareness of the urgency of hospital admission in case of severe chest pain. The advent of thrombolytic therapy has reinforced this sense of urgency. Advances in the treatment of ischemic stroke are presently being evaluated and if effective, appear to require a similar urgency of initiation .To evaluate emerging therapies for stroke, it is critical to be able to recruit patients within a few hours from onset of symptoms. This interval the ‘’therapeutic window’’ is considered to be within 3 to 4 hours for those evaluating cytoprotective therapies. Although apparently simple, the concept of therapeutic window actually includes a complex set of multiple windows, each corresponding to a distinct aspect of phenomenon. Medical treatment of acute stroke with thrombolytic agents has recently become available in India. Start of treatment in the narrow therapeutic time window is crucial for successful treatment with these agents. The therapeutic window is less than 3 hours for thrombolytic agents and the best results may be attained with administration

within 90 minutes. However, it has been seen that patients with acute stroke are often admitted late. There are many factors influencing health-seeking behaviours of patients after acute stroke. Some factors delay hospital admission and some results in early admission.

1.4 Statement of the problem

"A study to assess the factors Associated with Hospital Arrival Time for Stroke Patients in SCTIMST".

1.5 Objectives

- To identify the factors associated with hospital arrival time for stroke patients
- To assess the influence of these factors in seeking medical attention for stroke patients

1.6 Operational Definitions

Stroke: Stroke is the sudden death of brain cells due to lack of oxygen. A stroke occurs when blood circulation to the brain fails. It is caused by blockage or rupture of an artery in the brain.

Time of onset: The time when patient or observer first became aware of the symptoms.

Factors: demographic, medical, personal, attitudinal and social factors on time elapsed before arrival of patients to the stroke departments.

1.7 Research Methodology

Setting	: Stroke ICU
Population	: Stroke patients and their attendants
Sample size	: 30 patients
Sampling technique	: Convenience sampling technique is used.

1.8 Tool preparation

A standard structured questionnaire was completed for every patient by interviewing the patient (if possible) and the accompanying attendant/relative-(a) the stroke warning signs that most commonly result in the decision to seek hospital care, (b) who makes the decision to seek hospital care, (c) the most common mode of transportation to the hospital, (d) hospital arrival time in relation to the onset of the first warning sign, and (e) factors most associated with hospital arrival time for stroke survivors. The questionnaire documented the patient's age, sex, past history of transient ischemic attack (TIA), educational level, whether living alone or not, any stroke education, recognition of stroke by patient /relatives /doctor. Relation, age, sex, and educational level of attendant or relative were also noticed. The patient or attendant was asked whether he/she believed that the symptoms would improve spontaneously (low threat perception). Time of contact with the local doctor was also included if they contacted a local doctor. Mode of transport to the hospital was also included.

1.9 Delimitations

Patients or their attendants who can understand and speak Malayalam or English

Study is limited to ischemic stroke patients

Sample size is 30

Sample selected from only one institution

1.10 Summary:

This chapter leads with introduction, background of the study, need and significance, statement of the problem.objectives, operational definitions, research methodology, tool preparation, delimitations, summary, and organization of report.

1.11 Organization of the report

Chapter 2 deals with the summary of related studies reviewed.

Chapter - 2
REVIEW OF LITERATURE

2.1 Introduction

Review of literature is the key step in research process which help to lay a foundation for the study. The literature review provides a background for understanding current knowledge on topic and illuminate the significance of study. Literature review is a body of text that aims to review the critical points of current knowledge including substansive findings as well as contributions to the particular topic. Literature review are secondary sources, and as such, don't report any new or experimental work.

The literature review relevant for this study is presented on the following sections

2.2. Studies on factors associated with delayed and early hospital arrival of stroke patients

2.3 Studies on patient's knowledge regarding stroke

2.2. Studies on factors associated with delayed and early hospital arrival of stroke patients

Kim et al (2011) conducted a study to investigate factors associated with prehospital delay after acute ischemic stroke in Korea. The researchers conducted a prospective, multicenter study at 14 tertiary hospitals in Korea from March 2009 to July 2009. The researchers interviewed 500 consecutive patients with acute ischemic stroke who arrived within 48 hours. Univariate and multivariate analyses were performed to evaluate factors influencing prehospital delay. Researchers found that among the 500 patients (median 67 years, 62% men), the median time interval from symptom onset to arrival was 474 minutes

(interquartile range, 170-1313). Early arrival within 3 hours of symptom onset was significantly associated with the following factors: high National Institutes of Health Stroke Scale (NIHSS) score, previous stroke, atrial fibrillation, use of ambulance, knowledge about thrombolysis and awareness of the patient/bystander that the initial symptom was a stroke. Multivariable logistic regression analysis indicated that awareness of the patient/bystander that the initial symptom was a stroke (OR 4.438, 95% CI 2.669-7.381), knowledge about thrombolysis (OR 2.002, 95% CI 1.104-3.633) and use of ambulance (OR 1.961, 95% CI 1.176-3.270) were significantly associated with early arrival. Researchers concluded that in Korea, stroke awareness not only on the part of patients, but also of bystanders, had a great impact on early arrival at hospital. To increase the rate of thrombolysis therapy and the incidence of favorable outcomes, extensive general public education including how to recognize stroke symptoms would be important.

Teuschi et al (2010) conducted a study to determine discrepancies among factors influencing prehospital delay and stroke knowledge. The researchers reviewed studies reporting factors associated with better stroke knowledge and shorter time delays. The researchers searched MEDLINE for studies reporting factors associated with prehospital time of stroke patients, or knowledge of stroke symptoms. Further the researchers searched for studies reporting educational interventions aimed at increasing stroke symptom knowledge in the population. Researchers included a total of 182 studies. The researchers found that, those factors associated with better stroke knowledge such as education and sociodemographic variables were not related to shorter time delays. Few studies reported shorter time delays or better stroke knowledge in persons having suffered a previous stroke. Factors associated with shorter time delays were more severe stroke and symptoms regarded as serious, but not better knowledge about the most frequent symptoms such as hemiparesis or disorders of speech. Only 25-56% of patients recognized their own symptoms as stroke. While stroke education increases the knowledge of warning signs, a few population studies

measured the impact of education on time delays; in such studies, time delays decreased after education. This may partly be mediated by better organization of EMS and hospitals. Researchers interpreted that there was a discrepancy between theoretical stroke knowledge and the reaction in an acute situation. Help-seeking behaviour is more dependent on the perceived severity of symptoms than on symptom knowledge. Bystanders play an important role in the decision to call for help and should be included in stroke education. Education is effective and should be culturally adapted and presented in a social context. It is unclear which educational concept is best suited to enhance symptom recognition in the acute situation of stroke, especially in view of discrepancies between knowledge and action.

Sprigg et al (2009) conducted a systematic review to examine potential factors associated with delay in seeking medical review after TIA. The electronic databases MEDLINE, EMBASE, and Science Citation Index were searched for observational studies assessing patient delay in presentation after TIA. The search was restricted to studies published between December 1995 and September 2008. The electronic search yielded nine studies with data on presentation delay in patients with TIA; variations existed in study size, population and methodology. One study included patients with TIA only (n=241), whereas the remaining eight studies recruited both stroke and TIA patients. Overall, TIA patients (n=821) made up only a small proportion of the total number of patients in this analysis (n=3,202). Length of delay varied greatly across all studies. The researchers found that in most studies, patients with TIA who attended an emergency department arrived there within hours. Where patients first presented to their general practitioner, 50% attended within 24 hours whereas 25% waited 2 days or more. Recognition of symptoms as stroke/TIA did not reduce the delay. The researchers concluded that the majority of delay in seeking assessment after TIA is due to a lack of response by the patient—many patients do not recognise the symptoms of stroke/TIA, and even when they do, many fail to seek emergency medical attention. The public needs

educating on the importance of contacting the emergency medical services or attending an emergency department immediately after TIA.

Maesroni et al (2008) conducted a study to describe delays in presentation to hospital and in the emergency department (ED) management of patients with acute stroke and to identify factors influencing these delays in an Italian urban hospital. The researchers included all patients presenting with acute stroke, in whom arrival delay was ascertainable. To describe delays into the ED, the triage-visit delay, visit-computed tomography (CT) delay and visit-CT report delay were registered. Type of stroke, severity of stroke assessed using the modified National Institute of Health Stroke Scale (mNIHSS scale), level of consciousness, history of previous stroke or previous hospital admission, use of the emergency medical service (EMS), onset of stroke during day or night and admission during working or non-working day were registered for every patient. Univariate and multivariate analysis were performed to evaluate factors influencing early arrival. Over a one-year period 537 patients with acute stroke were evaluated; 375 patients in whom arrival delay was ascertainable were included in the study. Median arrival delay was 5.4 h (interquartile range (IQR) 2.7-11.6); 104 patients (28%) arrived within 3 h and 198 (53%) within 6 h. Triage-visit delay was 0.3 h (IQR 0.2-0.7), visit-CT scan delay was 1.2 h (IQR 0.8-1.9), visit-CT report delay was 2.7 h (IQR 1.7-4.5). Triage-visit delay and visit-CT delay were shorter for patients presenting within 3 h. The type of stroke was ischaemic in 240 (64%), haemorrhagic in 61 (16%) and transient ischaemic attack in 74 (20%). The median basal mNIHSS score was 5 (IQR 3-10); 64 patients (17%) had an altered level of consciousness, 103 (27%) had had a previous stroke, 223 (59%) had had a previous hospital admittance. In this series 214 patients (57%) arrived with the EMS, 323 (86%) presented with symptoms during the day, 261 (70%) were admitted during working days. Univariate analysis showed a significantly shorter arrival delay in patients calling the EMS (median 4.2 vs 7.2 h; $p<0.001$) and in patients with a higher basal mNIHSS score (Spearman rho = -0.204; $p<0.001$) or altered level of consciousness (normal 5.8 h, not alert but arousable 3.8, not alert but arousable with strong stimulation 2.5, totally

unresponsive 6.0; p = 0.005). Multivariate analysis showed that use of the EMS and higher basal mNIHSS score were independent variables associated with a shorter arrival delay. The researchers concluded that a substantial proportion of patients did not arrive at the ED in a suitable time for reperfusion therapy. Patients using the EMS have a shorter arrival delay. Approximately half of the patients with stroke are sufficiently aware of the urgency of this clinical condition to activate the emergency telephone system.

Daniel et al (2008) conducted a population based prospective study to assess the influence of general practice opening hours on healthcare seeking behaviour after transient ischaemic attack (TIA) and minor stroke and feasibility of clinical assessment within 24 hours of symptom onset. Setting was 9 general practices in Oxfordshire. The researchers assessed 91000 patients followed from 1 April 2002 to 31 March 2006. The researchers found that among 359 patients with TIA and 434 with minor stroke, the median (interquartile range) time to call a general practitioner after an event during surgery hours was 4.0 (1.0-45.5) hours, and 68% of patients with events during surgery hours called within 24 hours of onset of symptoms. Median (interquartile range) time to call a general practitioner after events out of hours was 24.8 (9.0-54.5) hours for patients who waited to contact their registered practice compared with 1.0 (0.3-2.6) hour in those who used an emergency general practitioner service (P<0.001). In patients with events out of hours who waited to see their own general practitioner, seeking attention within 24 hours was considerably less likely for events at weekends than weekdays (odds ratio 0.10, 95% confidence interval 0.05 to 0.21): 70% with events Monday to Friday, 33% on Sundays, and none on Saturdays. Thirteen patients who had events out of hours and did not seek emergency care had a recurrent stroke before they sought medical attention. A primary care centre open 8 am-8 pm seven days a week would have offered cover to 73 patients who waited until surgery hours to call their general practitioner, reducing median delay from 50.1 hours to 4.0 hours in that group and increasing those calling within 24 hours from 34% to 68%. The researchers concluded that

general practitioners' opening hours influence patients' healthcare seeking behaviour after TIA and minor stroke. Current opening hours can increase delay in assessment. Improved access to primary care and public education about the need for emergency care are required if the relevant targets in the national stroke strategy are to be met.

Siddiqui et al (2008) conducted a cross sectional study to determine the proportion of patients with acute stroke presenting late to hospital and to identify the factors that delay hospital arrival of patients with acute stroke. A cross sectional study was carried out between Sept 2006 to Feb 2007 in the department of Neurology, Liaquat National Hospital Karachi. All patients of both genders, age >18 years with symptoms of stroke and neuro- imaging (CT scan/MRI brain) findings consistent with stroke were included. A total of 165 patients attending the Emergency department were included. There were 86 (52%) males and 79 (47.9%) females. The mean age was 60.04+/-13.98 years, (males 58.2 years and females 61.9 years). The median delay from onset of symptoms to hospital arrival was six hours. Only 28.5% of the patients came within three hours while 71.5% after three hours. Attendants of 47 patients had a low threat perception, 53 (32%) of the patients did not know a single symptom of stroke and 63% (104) patients first contacted their General Practitioner who referred them to hospital. Similarly 60.6% of patients were first taken to a local hospital not equipped to handle major emergencies. The researchers concluded that time elapsed from onset of symptoms to hospital arrival is influenced by lack of knowledge of stroke symptoms, contact with a local doctor, low threat perception and non availability of ambulance services.

Chen et al (2007) conducted a prospective study to investigate the time lags and the factors causing pre-hospital and emergency department (ED) delay during acute ischemic stroke attack. The researchers prospectively studied 129 acute ischemic stroke patients who presented to the ED of the study hospital within 4 hours after symptom onset between June 2004 and October 2005. Univariate and

multiple logistic regression analyses was performed to evaluate the factors influencing delays in the ED presentation of acute ischemic stroke patients. The median time from symptom onset to ED arrival was 71 (mean +/- SD, 82.7 +/- 57.7) minutes. The median times from ED arrival to neurologic consultation, computed tomography scan, electrocardiogram, and laboratory data completion were 10 (11.3 +/- 9.9) minutes, 17 (9.6 +/- 11.3) minutes, 14 (23.3 +/- 55) minutes, and 39 (44.4 +/- 24.5) minutes, respectively. Univariate and multiple logistic regression models revealed that age < 65 years, illiteracy and awakening with symptoms were the most significant factors related to a delay in ED presentation. The researchers concluded that organization of a stroke team and standardized stroke pathways may help to shorten in-hospital time consumption. Educational efforts should not only focus on the public, but also on the training of ED physicians and other medical personnel.

Mandelzweiq et al (2006) conducted a study to determine whether the perceptual, social, and behavioral factors affect delays in seeking help after symptom onset. The patients presenting with stroke symptoms were interviewed about symptom experiences, interpretations, and reactions. Odds ratios (95% CI) for risk of delay >3 hours were estimated, and variables associated with increased risk and representing demographic, clinical, perceptual, social, and behavioral factors were included in an assessment of the effect of combined risk factors on delay. The researchers found that among 209 patients (mean age 61.8±12 years, 69% men) the median time interval from symptom awareness to seeking help was 2 (0.5 to 9) hours and to hospital arrival, 4.2 (1.3 to 14.5) hours. On multivariate adjustment, perceiving symptoms as severe (odds ratio [OR]: 0.42; 0.17 to 0.95), advice from others to seek help (OR: 0.18; 0.05 to 0.63), and contacting an ambulance (OR: 0.26; 0.10 to 0.63) were associated with decreased risks of delay, whereas perceived control of symptoms (OR: 2.45; 1.08 to 5.71) increased risk of delay in seeking help. Risk of delay in hospital arrival was 3 times greater in women than in men. Increasing proportions of patients who delayed seeking help were observed with increasing numbers of

combined risk factors, ranging from 17% to 94% for 0 to 1 and 6 to 7 factors, respectively. The researchers concluded that perceptual, social, and behavioral factors contribute to delay in seeking medical care in acute ischemic stroke beyond demographic and clinical variables, and, when combined, further increase risk of delay. These findings may be important for designing programs to reduce delay.

Pandian et al (2006) conducted a prospective study to assess the various factors delaying admission to a stroke unit of the Christian Medical College, Ludhiana. The study was conducted over a 15-month period ending September 2003. Patients or their relatives were interviewed within 48 hours of admission using a structured questionnaire. Of the 147 patients interviewed, 99 (67%) were men and the mean age was 59.7 +/- 14.1 years. A total of 43 (29%) patients presented within 3 hours of stroke onset. Only 12% of patients came by ambulance. Directly reaching the stroke department ($P < .001$, odds ratio [OR] 4.2, confidence interval [CI] 3.13-8.45), distance 10 km or less from the hospital ($P < .03$, OR 4.0, CI 1.12-9.24), and presence of aphasia ($P < .03$, OR 3.7, CI 1.47-7.92) were the factors associated with an early arrival. The researchers found that there was a considerable amount of delay in the early arrival of patients to their stroke department. The researchers concluded that both local physicians and the public should be educated about the importance of early referrals and presentation to the stroke centers.

Chang et al (2004) conducted a study to examine the extent of and factors associated with prehospital delays after acute stroke in Taiwan, where people are new to thrombolytic therapy for stroke. Data were prospectively collected from 196 patients admitted with acute stroke who presented to the emergency department (ED) of the study hospital within 48 hours of symptom onset before intravenous recombinant tissue plasminogen activator was approved. Prehospital delay was defined as time from symptom onset to the ED arrival. Univariate and multivariable regression analyses were conducted to evaluate factors influencing

delay in ED presentation and delay in decision to seek medical help. The researchers found that the median interval between symptom onset and decision to seek medical contact was 90 minutes; the median interval between symptom onset and ED arrival was 335 minutes. The time from symptom onset to first call for medical help accounted for 45% (95% confidence interval, 41 to 50) of the prehospital delay. Advanced age delayed the decision to seek medical help, whereas stroke severity reduced the risk for this delay. The researchers concluded that the time interval between symptom onset and the decision to call for medical care is far from optimal and is the underlying cause of prolonged prehospital delay. Educational efforts are urgently needed. to reduce extent of delay.

Lacy et al (2001) conducted a study to find current patterns of stroke care by determining delays in time from onset of signs or symptoms to arrival at the emergency department and to initial evaluation by physicians and by identifying factors associated with these delays. Data were prospectively collected by nurses and physicians from patients, patients' family members, and medical records from 10 hospitals of the Robert Wood Johnson Health System in New Jersey. The researchers studied a total of 553 patients who presented with signs or symptoms of acute stroke . Thirty-two percent of patients arrived at the emergency department within 1.5 hours of stroke onset. Forty-six percent of patients arrived within 3 hours and 61% within 6 hours. Delays in arrival time were significantly associated with sex, race, transportation mode, and history of cardiovascular disease. Patients arriving by ambulance were more likely to present earlier (odds ratio [OR] 3.7 for arrival within 3 hours; OR 4.5 for arrival within 6 hours). Patients arriving by ambulance (OR 2.3 within 15 minutes; OR 1.7 within 30 minutes) and those requiring admission to intensive care units (OR 4.5 within 15 minutes and OR 5.2 within 30 minutes) were examined sooner by physicians. The researchers concluded that despite national efforts to promote prompt stroke evaluation and treatment, significant delays still existed. The lack of improvement throughout the past decade underscores the need for

implementation of effective public health programs designed to minimize the time to evaluation and treatment of stroke.

Srivastava et al (2001) conducted a prospective study to assess the factors influencing the delay in admission of acute stroke cases. 110 cases (71 males, 39 females) of acute stroke that arrived within 72 hours at hospital casualty were recruited. A standardized structured questionnaire was given to patients or their attendants. The median time to casualty arrival was 7.66 hours with 25% cases arriving within 3 hours and 49 % cases within 6 hours. Distance from hospital, contact with a local doctor and low threat perception of symptoms of stroke were independent factors associated with delay in arrival. Living in city, presence of family history and older age were associated with early arrival. The researchers found no correlation between patients' or attendants' sex, educational status, history of previous stroke or transient ischemic attack, subtype or severity of stroke, time of stroke and availability of transport. The researchers concluded that adequate measures need to be taken to improve the public awareness of stroke and the role of local doctors.

Derex et al (2002) conducted a study to determine factors associated with early admission in a French stroke unit. The researchers prospectively studied the admission delay of acute stroke patients in a French stroke unit during a 12-month period ending July 1999. Univariate and multivariate regression analyses were performed to evaluate the factors influencing early stroke unit admission and transport by the Emergency Medical Services (EMS) or Fire Department (FD) ambulances. The researchers found that One hundred sixty-six patients were primarily admitted to the stroke unit, with a median admission time of 4 hours 5 minutes. Twenty-nine percent presented within 3 hours of symptoms onset and 75% within 6 hours. Univariate analysis showed that early stroke unit arrival was significantly associated with the following factors: female sex, stroke severity assessed by the National Institutes of Health Stroke Scale score, lowered consciousness, sudden onset of stroke, not living alone, recognition of symptoms

by bystanders, and transport by EMS or FD ambulances. Age, ethnicity, level of education, employment status, nocturnal onset, distance from place of stroke to the stroke unit, stroke lesion location, presence of brain hemorrhage, and awareness about the symptoms and risk factors of stroke had no measurable effect on early admission. A multivariate regression model demonstrated that the most significant factors associated with early stroke unit arrival were transport by EMS or FD ambulances and sudden onset of stroke. Female sex and not living alone were also significantly associated with early admission in the multivariate model. Multivariate analysis of the mode of transport showed that transport by EMS or FD ambulances was significantly more frequent among female patients, when bystanders, and when the general practitioner was not the first medical contact recognized stroke symptoms. Their study showed that hospital arrival within the first hours of stroke is feasible in a French stroke unit. As many as 75% of the patients are admitted within the first 6 hours of stroke. The researchers found this as the first study demonstrating that stroke unit admission in France is fastest in patients brought to the hospital by EMS or FD ambulances. However, only 35% of stroke patients activate the emergency telephone system and are currently transported by EMS or FD ambulances. French stroke patients should be encouraged to seek immediate medical attention by using the emergency telephone system, and stroke management should be reprioritized in the French EMS as a time-dependent medical emergency, with the same level of organization and expertise currently applied to myocardial infarction.

Feldman et al (1993) conducted a prospective study to explore the factors associated with early presentation of stroke patients to physicians. The researches prospectively studied 100 consecutive acute stroke patients presenting to three large, urban medical centers. Using a standardized, structured interview and chart review, they assessed patient education about stroke, risk factors, clinical features of the stroke, source of stroke recognition, and timing of presentation. The researchers did not study the distance from the site of stroke onset to the site of physician contact. The researchers found that stroke onset

time was known in 96 of the patients. Mean patient age was 71.3 years, 79% had at least one stroke risk factor, 26% had prior transient ischemic attack, 19% had prior stroke, 74% had some high school education, and 86% had regular physicians. Only 8% had been previously educated about stroke symptoms. Eighty one percent of strokes were ischemic. The mean time to physician contact was 13.4 +/- 2.3 hours (median, 4.0 hours) and to neurologist contact was 21.2 +/- 2.9 hours. A skewed distribution of presentation times accounts for the mean-median differences. A small number of patients presenting very late could have an effect on the correlations between presentation time and the variables studied. Early presentation time was associated with increased age, the sudden onset of a stable deficit, and recognition that the symptoms signified stroke. Only the sudden onset of a stable deficit correlated independently with early presentation time (P = .0048). The researchers found no correlation between presentation time and prior transient ischemic attack or stroke, headache, vomiting, loss of consciousness or seizures at onset, or stroke subtype, but a type II error could not be excluded.The researchers concluded that despite their education level, regular health care, and risk factors, especially prior stroke and transient ischemic attack, these patients were not knowledgeable about stroke and delayed many hours before contacting physicians. The course of symptoms and recognition that they signified stroke were associated with earlier presentation. Patient education focused on groups at risk might hasten the presentation and treatment of acute stroke.

2.3 Studies on patient's knowledge regarding stroke

Sloma et al (2010) conducted a study among primary health care patients with stroke/TIA regarding their knowledge about risk factors for having a new event of stroke/TIA, possible associations between patient characteristics and patients' knowledge about risk factors, and patients' knowledge about their preventive treatment for stroke/TIA. A questionnaire was distributed to 240 patients with stroke/TIA diagnoses, and 182 patients (76%) responded.

Researchers asked 13 questions about diseases/conditions and lifestyle factors known to be risk factors and four questions regarding other diseases/conditions ("distractors"). The patients were also asked whether they considered each disease/condition to be one of their own. Additional questions concerned the patients' social and functional status and their drug use. The t-test was used for continuous variables, chi-square test for categorical variables, and a regression model with variables influencing patient knowledge was created. Hypertension, hyperlipidemia and smoking were identified as risk factors by nearly 90% of patients, and atrial fibrillation and diabetes by less than 50%. Few patients considered the distractors as stroke/TIA risk factors (3–6%). Patients with a family history of cardiovascular disease, and patients diagnosed with carotid stenosis, atrial fibrillation or diabetes, knew these were stroke/TIA risk factors to a greater extent than patients without these conditions. Atrial fibrillation or a family history of cardiovascular disease was associated with better knowledge about risk factors, and higher age, cerebral haemorrhage and living alone with poorer knowledge. Only 56% of those taking anticoagulant drugs considered this as intended for prevention, while 48% of those taking platelet aggregation inhibitors thought this was for prevention. Researchers concluded that knowledge about hypertension, hyperlipidemia and smoking as risk factors was good, and patients who suffered from atrial fibrillation or carotid stenosis seemed to be well informed about these conditions as risk factors. However, the knowledge level was low regarding diabetes as a risk factor and regarding the use of anticoagulants and platelet aggregation inhibitors for stroke/TIA prevention. Better teaching strategies for stroke/TIA patients should be developed, with special attention focused on diabetic patients.

Yoon et al (2001) conducted a study to assess baseline knowledge regarding stroke risk factors, symptoms, treatment, and information resources. A community-based telephone interview survey was conducted in the Newcastle urban area in Australia. A total of 1278 potential participants between the ages of 18 to 80 were selected at random from an electronic telephone directory. A

trained telephone interviewer conducted a telephone survey using the Computer-Assisted Telephone Interviewing (CATI) program. A total of 822 participants completed the telephone interview. Six hundred three participants (73.4%) correctly identified the brain as the affected organ in stroke. The most common risk factors for stroke identified by respondents were smoking (identified by 324 [39.4%]) and stress (identified by 277 [33.7%]). The most common warning sign of stroke described by respondents was “blurred and double vision or loss of vision in an eye,” listed by 198 (24.1%). A total of 626 (76.2%) respondents correctly listed ≥1 established stroke risk factor, but only 409 (49.8%) respondents correctly listed ≥1 warning sign. The researchers concluded that the level of knowledge in the community of established stroke risk factors, warning signs, and treatment as indicated by this survey suggested that a community-based education program to increase public knowledge of stroke might contribute to reducing the risk of stroke and to increasing the speed of hospital presentation after the onset of stroke.

Williams et al (1997) conducted a study to assess stroke patients' general knowledge about stroke, their interpretation of stroke symptoms, and how these factors influence the timing of their decision to seek medical attention. The researchers interviewed consecutive stroke patients within 72 hours of stroke onset to define factors influencing time of arrival to the emergency department. Data recorded included demographic information, method of transportation, type of stroke symptoms, the patient's interpretation of the symptoms, previous stroke, and knowledge of stroke warning signs. Stroke severity was measured with the Barthel Index. Early arrival was defined as within 3 hours of awareness of symptoms. Sixty-seven patients were interviewed; 96% had an ischemic stroke and 4% a cerebral hemorrhage. Although 38% of patients professed to know the warning signs of stroke, only 25% correctly interpreted their symptoms. Patients with prior stroke were more likely to correctly interpret their symptoms (45% versus 16%; P = .03) but were not more likely to present early (19% versus 39%; P = .35). Eighty-six percent of patients presenting more than 3 hours after stroke

onset thought that their symptoms were not serious. The 24% (n = 16) of early arrivals were more likely to arrive by ambulance (81% versus 38%; P = .003) and had more severe stroke (Barthel Index score of 49 versus 72; P = .01) than late arrivals. Arrival by ambulance was independently associated with early arrival (odds ratio, 5.55; 95% confidence interval, 1.37 to 22.6). Researchers concluded that approximately one quarter of stroke patients correctly interpret their symptoms as representing a stroke. This knowledge is not associated with early presentation to the emergency department. Ambulance transport is independently associated with early arrival at the emergency department. Even when patients knew that they were having a stroke, most presented late because they perceived their symptoms as "not serious." Widespread public education of stroke-prone individuals might increase the proportion of patients eligible for new acute stroke treatments.

Kothari et al (1997) conducted a study to determine knowledge at the time of symptom onset regarding the signs, symptoms, and risk factors of stroke in patients presenting to the emergency department with potential stroke. Patients admitted from the emergency department with possible stroke were identified prospectively. A standardized, structured interview with open-ended questions was performed within 48 hours of symptom onset to assess patients' knowledge base concerning stroke signs, symptoms, and risk factors. Of the 174 eligible patients, 163 patients were able to respond to the interview questions. Of these 163 patients, 39% (63) did not know a single sign or symptom of stroke. Unilateral weakness (26%) and numbness (22%) were the most frequently noted symptoms. Patients aged ≥65 years were less likely to know a sign or symptom of stroke than those aged <65 years (percentage not knowing a single sign or symptom, 47% versus 28%, P=.016). Similarly, 43% of patients did not know a single risk factor for stroke. The elderly were less likely to know a risk factor than their younger counterparts. The researchers concluded that almost 40% of patients admitted with a possible stroke did not know the signs, symptoms, or

risk factor of a stroke. Further public education is needed to increase awareness of the warning signs and risk factors of stroke.

2.4 Summary

Key words used for search

Delay Time

Acute stroke

Early arrival

Chapter - 3
METHODOLOGY

3.1 Introduction

Research methodology is the systemic way to solve the research problem. It includes the step that researcher adopts to study his problem with the logic behind. It indicates the general pattern of organizing the procedure of gathering valid and reliable data for an investigation.

This chapter provides a brief description of the method adopted by the investigator to conduct this study. This chapter deals with research approach, study design the sample and sampling technique. It further deals with the development and description of the tool, pilot study, data collection, procedure and plan of analysis.

3.2 Objectives of the study

The objectives of the study were

- To identify the factors associated with hospital arrival time for stroke patients
- To assess the influence of these factors in seeking medical attention for these patients

3.3 Research approach

Survey method

3.4 Setting of the study

The study was conducted in the stroke ICU and general medical ward of Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum.

3.5 Study population:

Stroke patients who were admitted in the stroke ICU and general medical ward of Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum.

3.6 Sample and sampling technique

Purposive sampling technique was used. The sample consisted of ischemic stroke patients in stroke ICU and general medical wards of SCTIMST. The sample size was 30. The duration of the study was from September 2011to October 2011.

3.7 Inclusion criteria:

Patients or their relatives who were willing to participate

Patients with diagnosis of ischemic stroke

Patients or their relatives who can understand Malayalam or English

3.8 Exclusion criteria:

Patients or their relatives who did not understand Malayalam or English

Patients who were not willing to participate

3.9 Development of the tool:

An extensive study and review of literature helped in the preparation of the tool and experts in SCTIMST Trivandrum approved it. . A self-prepared validated questionnaire was used as the tool for this study.

3.10 Description of the tool

The questionnaire consists of two parts with a total of 30 questions.

Part 1: This part contains demographic and clinical data such as patient's name, age, sex, marital status, category, occupation, date of admission, NIHSS score on admission, level of consciousness, distance from hospital, place of living, comorbidities, bad habits, and time of onset of stroke, family history of stroke and previous history of stroke. Part 1 contains 14 questions.

Part 2: This includes questions regarding initial symptoms, time of onset, threat perception, local doctor contact, mode of transportation, knowledge about stroke warning signs treatment and time of arrival. Part 2 contains 16 questions.

3.11 Pilot study

Pilot study was conducted in the month of September after obtaining permission from higher authorities. The study was conducted in 6 patients both male and female.

3.12 Data collection procedure

Data collected from 30 patients (or their relatives) admitted in stroke ICU by interviewing them using a self-prepared questionnaire. The final study was conducted during the month of October 2011, for a period of 30 days. The time of hospital arrival from symptom onset, treatment received, NIHSS score at discharge, and the outcome also were included.

3.13 Plan for analysis

The investigator developed the plan of analysis after the study. The data obtained from the samples were analyzed using descriptive statistics.

3.14 Summary

This chapter contains research approach, settings, population, sample and sampling technique, development and description of tool, data collection and plan of analysis.

Chapter - 4
ANALYSIS AND INTERPRETATIONS

4.1.Introduction

Analyses are process of organizing and synthesizing data in such a way research questions can be answered. The questionnaire was based on the factors associated with hospital arrival time after stroke. Interpretation refers to a process of making sense of the result and examining the implications of the findings in a boarder context. This chapter gives analysis and interpretation of data collected from 30 ischemic stroke patients admitted in STROKE ICU and GMW of SCTIMST, Trivandrum. The aim of the study was to identify the factors associated with hospital arrival time after stroke and to assess the influence of these factors in seeking medical attention after stroke.

The findings of the study were arranged and analyzed under the following sections.

4.2(a) Distribution of sample according to demographic data

4.2(b) Distribution of sample according to various factors associated with hospital arrival time.

4.2(a) Distribution of sample according to demographic data.

4.1 Distribution of samples by age

Age of patients ranged from 27 to 78 years with a median of 66.5 and a mean age of 60.3 yrs.

Table 4.1 Distribution of samples by age

Age in years	Frequency	Percentage
20 to 40	5	16.7
40 to 60	4	13.3
>60	21	70

The data given in Table 4.1 shows the majority of patients (70%) were above 60 yrs.

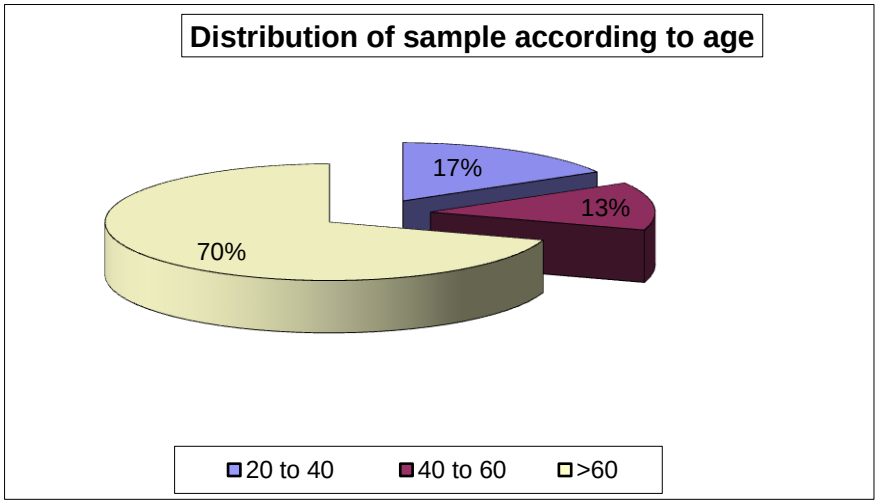

Figure 4.1 shows distribution of sample by age.

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4.2 Distribution of sample according to occupation

Table 4.2 Distribution of sample according to occupation

Occupation	Frequency	Percentage
Yes	8	26.7
No	22	73.3
Total	30	100

Table 4.2 shows that majority of samples (73.3%) did not have any job.

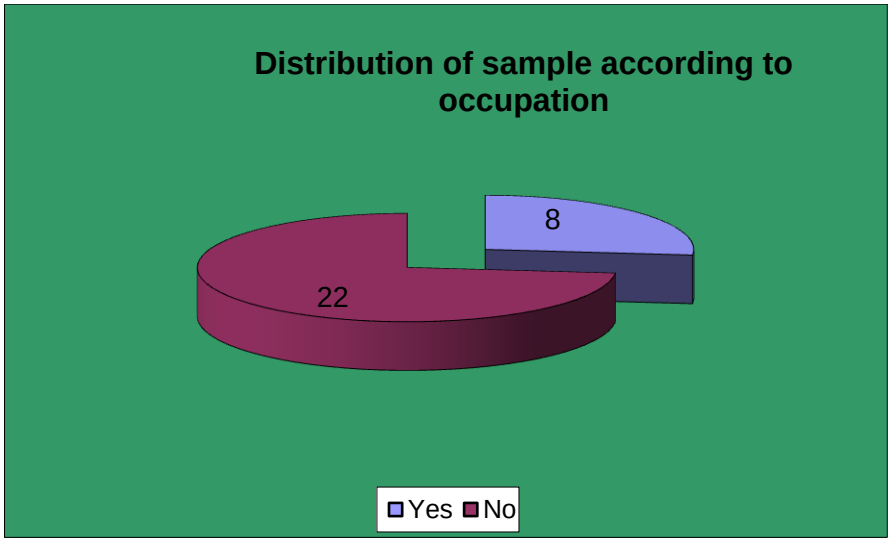

Figure 4.2 shows distribution of sample according to occupation.

4.3 Distribution of sample according to distance from hospital

Distance from hospital ranged from 3 to 80 km with a median distance of 51 km and a mean of 45.37 km.

Table 4.3 shows distribution of sample according to distance from hospital

Distance	Frequency	Percentage
Within 10 km	5	16.7
10 to 50 km	10	33.3
>50 km	15	50
Total	30	100

Table 4.6 shows that 50% of patients came from a distance of >50 km.

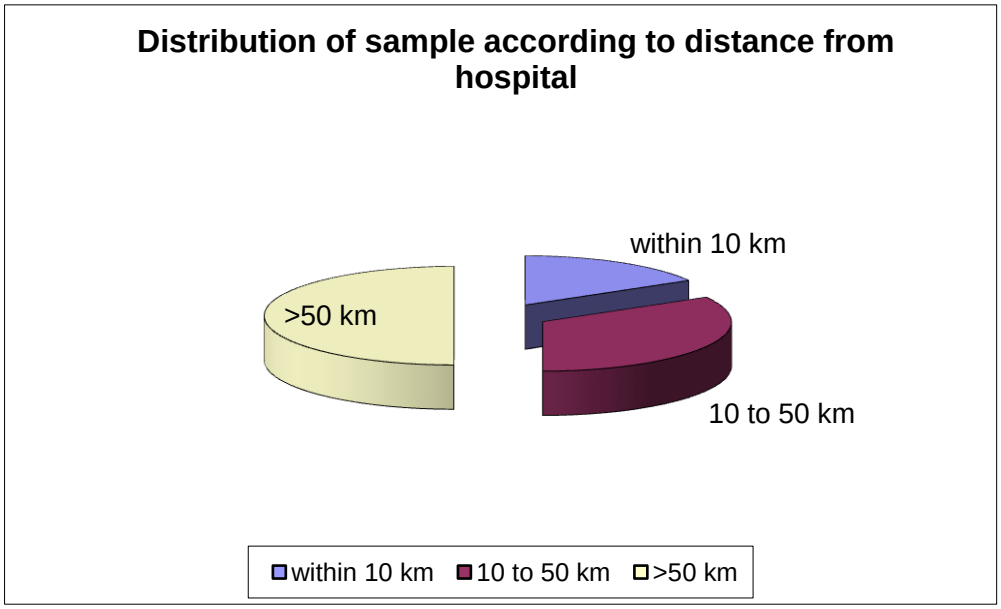

Figure 4.6 shows distribution of samples according to distance from hospital

4.4 Distribution of samples according to level of consciousness

Table 4.3 Distribution of samples according to level of consciousness

LOC	Frequency	Percentage
Conscious	24	80
unconscious	6	20
Total	30	100

Table 4.3 shows that 80% of patients were conscious at the time of admission.

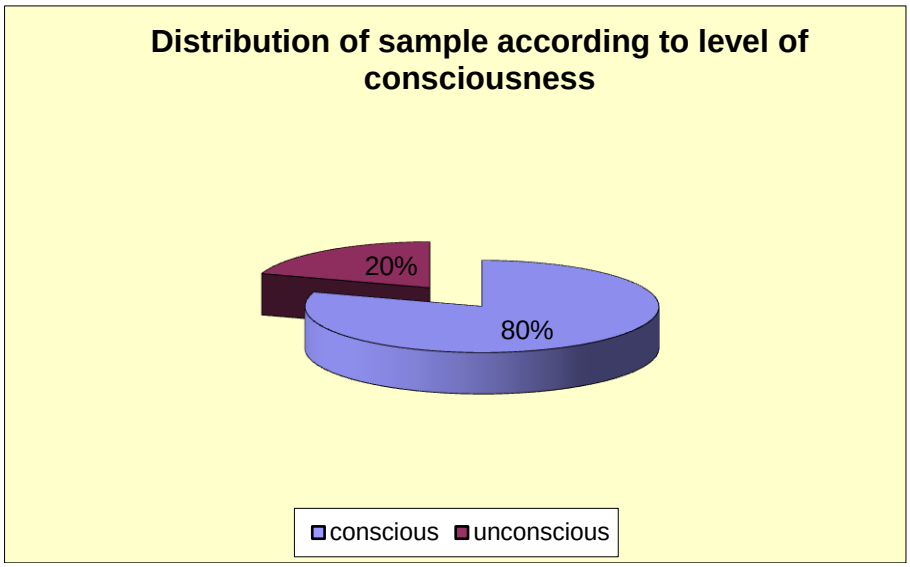

Figure 4.3 shows distribution of samples according to level of consciousness.

Table 4.4(a) Distribution of sample according to selected variables

Variables	**Frequency**	**Percentage**
Sex		
Male	22	73.3
Female	8	26.7
Total	30	100
Educational Status		
Primary	22	73.3
Secondary	3	10
Graduation	5	16.7
Total	30	100
Place Of living		
Town	14	46.7
Village	16	53.3
Total	30	100
Risk Factors **Diabetes Mellitus**		
Yes	17	56.7
No	13	43.3
Total	30	100
Hypertension		
Yes	17	56.7
No	13	43.3
Total	30	100
Hypercholosterolemia		
Yes	13	43.3
No	17	56.7
Total	30	100

Variables **Smoking**	**Frequency**	**Percentage**
Yes	9	30
No	21	70
Total	30	100
Alcoholism		
Yes	9	30
No	21	70
Total	30	100
Increased fat consumption		
Yes	3	10
No	27	90
Total	30	100

4.2 (b) Distribution of sample according to various factors associated with hospital arrival time

4.4 Distribution of sample according to history of stroke

Table 4.4(b) Distribution of sample according to previous history of stroke

Previous history of stroke	Frequency	Percentage
Yes	4	13.3
No	26	86.7
Total	30	100

Table 4.4(b) shows that only 13.3% patients had a previous history of stroke.

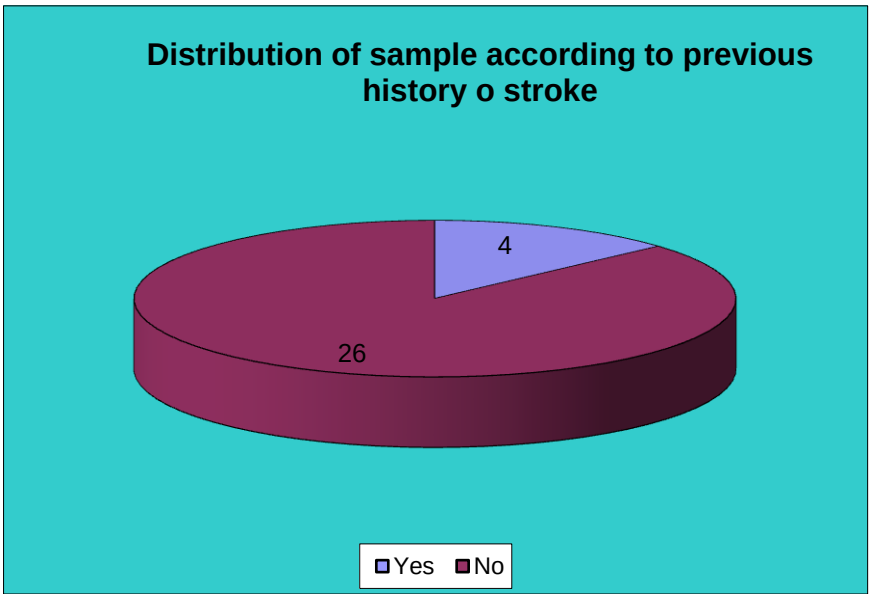

Figure 4.4(b) shows distribution of sample according to previous history of stroke.

4.4 (c) Distribution of sample according to family history of stroke

Only one patient had a family history of stroke.

4.5 Distribution of sample according to perception of reason

Table 4.5 Distribution of sample according to perception of reason

Perception of reason	Frequency	Percentage
Don't know	14	46.7
BP changes	11	36.7
Others	4	13.3
Stroke	1	3.3
Total	30	100

Table 4.5 shows that only one patient perceive the initial symptoms as stroke. Majority of persons (46.7%) do not know the exact reason.

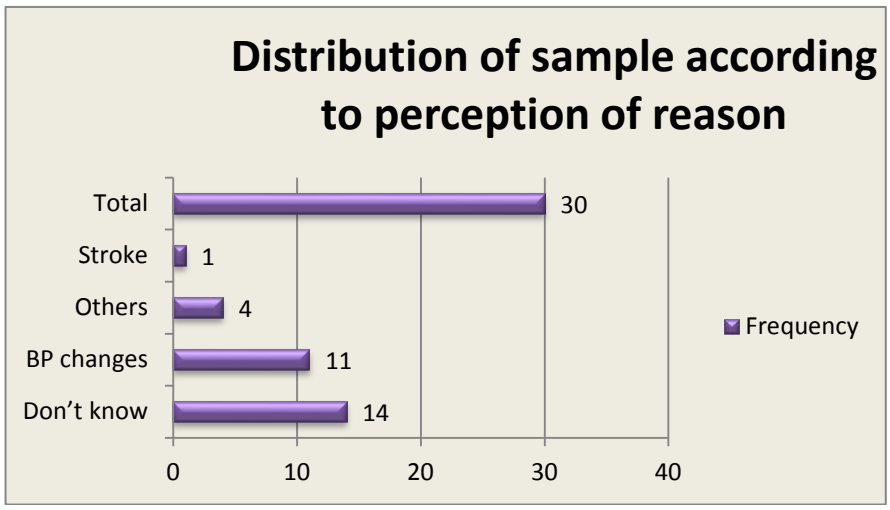

Figure 4.5 shows distribution of sample according to perception of reason.

Table 4.6Distribution of sample according to perception of something wrong

Table 4.6 Distribution of sample according to perception of something wrong

Feel wrong	Frequency	Percentage
During initial symptoms	19	63.3
After worsening of symptoms	11	36.7
Total	30	100

Table 4.6 shows that 36.7% of patients felt something wrong only after worsening of symptoms.

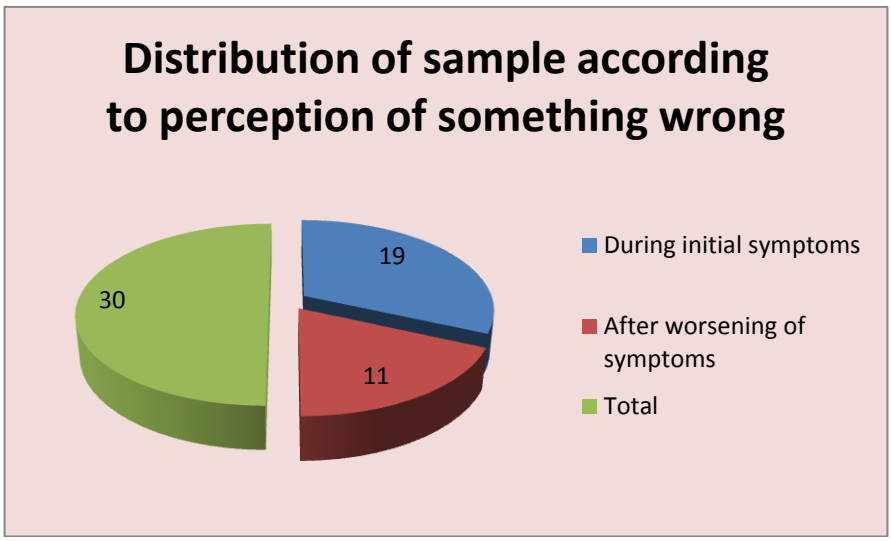

Figure 4.6 shows distribution of sample according to perception of something wrong.

4.7Distribution of sample according to threat perception

Table 4.7 Distribution of sample according to threat perception

Threat Perception	Frequency	Distribution
High	2	6.7
Low	28	93.3
Total	30	100

Table 4.7 shows that 93.3% of patients had low threat perception.

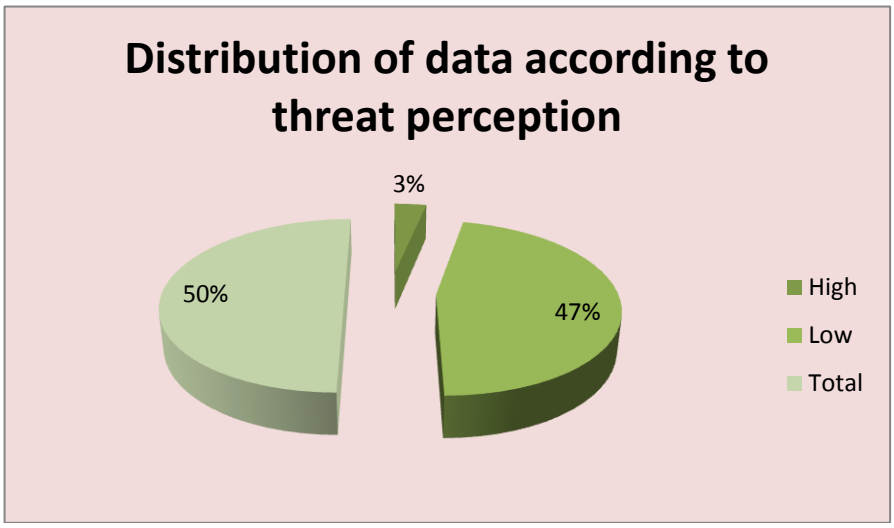

Figure 4.7 shows distribution of sample according to threat perception.

4.8Distribution of data according to perception of necessity of quick treatment

Table 4.8 Distribution of data according to perception of necessity of quick treatment

Feel necessity for quick treatment	Frequency	Percentage
Yes	26	86.7
No	4	13.3
Total	30	100

Table 4.8 shows that majority (86.7%) of patients feel necessity for quick treatment.

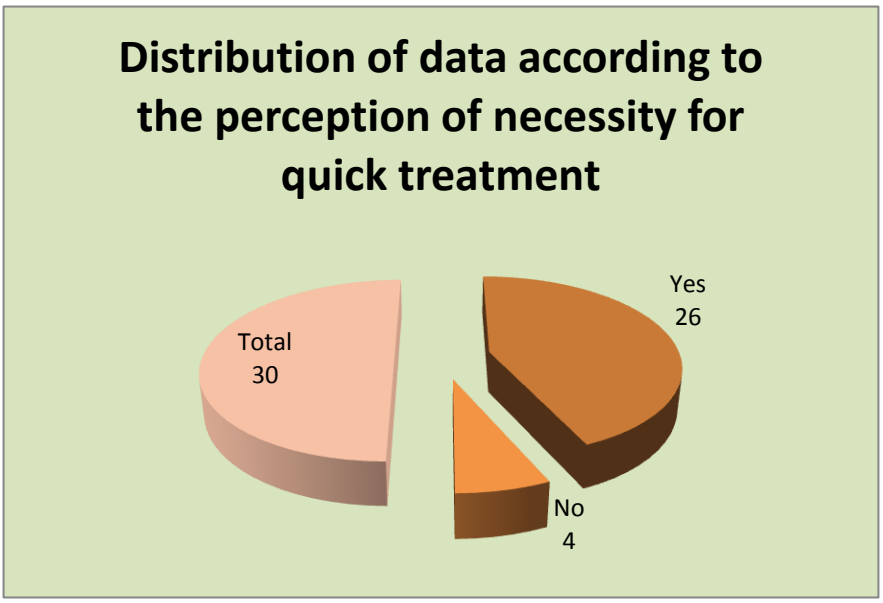

Figure 4.8 shows distribution of data according to perception of necessity of quick treatment.

4.9Distribution of sample according to type of stroke

All the patients had ischemic stroke

4.10Distribution of samples according to knowledge status

Table 4.10(a) Distribution of samples according to knowledge about warning signs of stroke

Knowledge about warning signs of stroke	Frequency	Percentage
Yes	4	13.3
No	26	86.7
Total	30	100

Table 4.10(a) shows that 86.7% did not know warning signs of stroke.

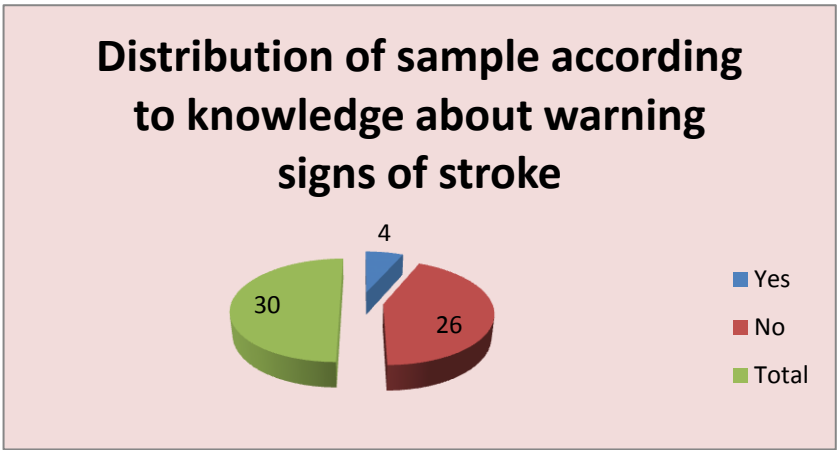

Figure 4.10(a) shows distribution of samples according to knowledge about warning signs of stroke.

4.10(b) Distribution of sample according to knowledge about treatment for stroke

Table 4.10 (b) Distribution of sample according to knowledge about treatment for stroke

Knowledge about treatment for stroke	Frequency	Percentage
Yes	1	3.3
No	29	96.7
Total	30	100

Table 4.10(b) shows that only one patient had knowledge about treatment for stroke.

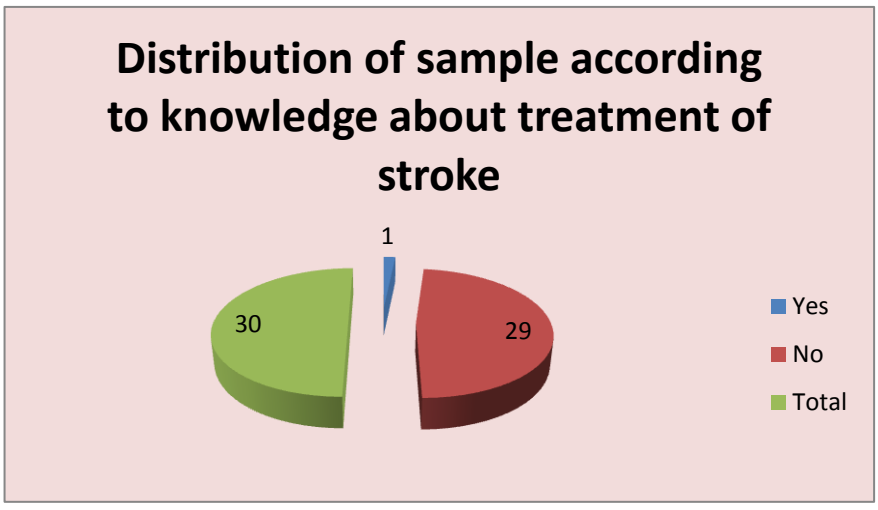

Figure 4.10(b) shows distribution of sample according to knowledge about treatment for stroke.

4.11 Distribution of the sample according to decision maker

All patients except three had family members as the decision maker. Three patients took decision for hospitalization by themselves.

4.12 Distribution of data according to local doctor contact

All the patients had local doctor contact.

4.13 Distribution of data according to treatment

Table 4.13 Distribution of data according to treatment

Treatment	Frequency	Percentage
Antiplatelets	22	73.40
Diuretics	4	13.3
tPA	3	10
Anticoagulants	1	3.3
Total	30	100

Table 4.13 shows that only 10% of patients received tPA.

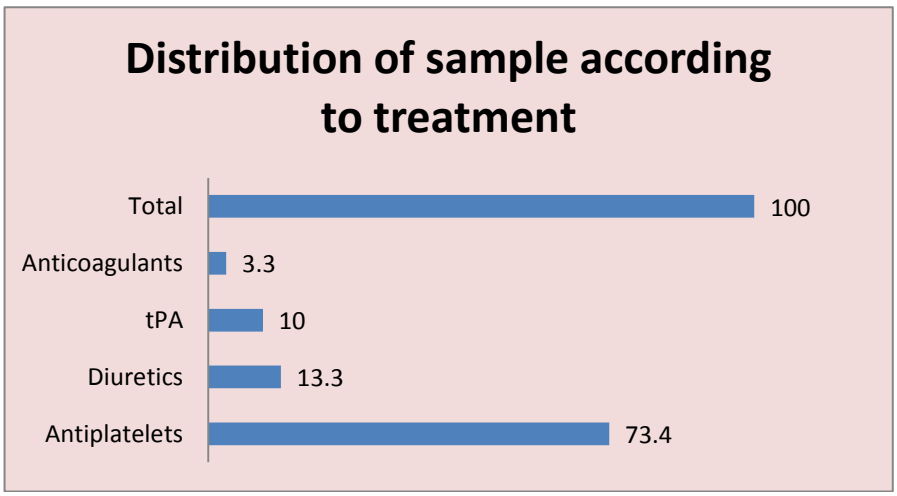

Figure 4.13 shows distribution of data according to treatment .

4.14 Distribution of sample according to Time from symptoms to decision making

Time from symptoms to decision making ranges from .45 min to 2880 hrs with a mean of 112.59 hrs.

Table 4.14 Distribution of sample according to Time from symptoms to decision making

Time	Frequency	Percentage
Within 4.5 hrs	20	66.7%
4.5 hrs to 1 day	6	20%
1 day to 1 week	2	6.7%
1 week to 1 month	1	3.3%
>1 month	1	3.3%
Total	30	100%

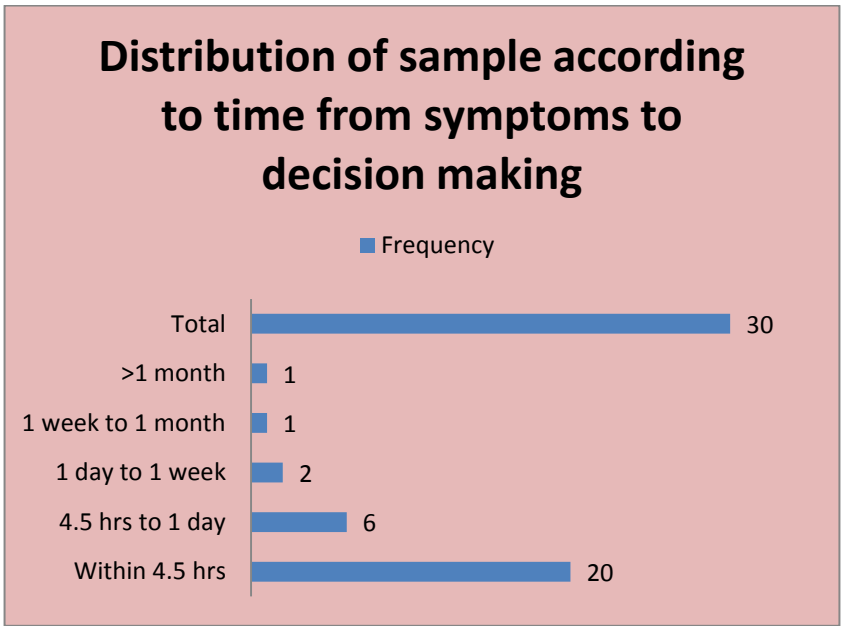

Figure 4.14 shows distribution of sample according to Time from symptoms to decision making

4.15 Distribution of sample according to Time from symptoms to hospitalization.

Time from symptoms to hospitalization ranges from 1.15 hrs to 3240 hrs with a mean of 153 hrs.

Table 4.15 Distribution of sample according to Time from symptoms to hospitalization.

Time	Frequency	Percentage
Within 4.5 hrs	4	13.3%
4.5 hrs to 1 day	11	36.7%
1 day to 1 week	12	40%
1 week to 1 month	2	6.7%
>1 month	1	3.3%
Total	30	100%

Table 4.15 shows that only 13.3 % of patients reached the hospital within 4.5 hrs after the symptom onset.

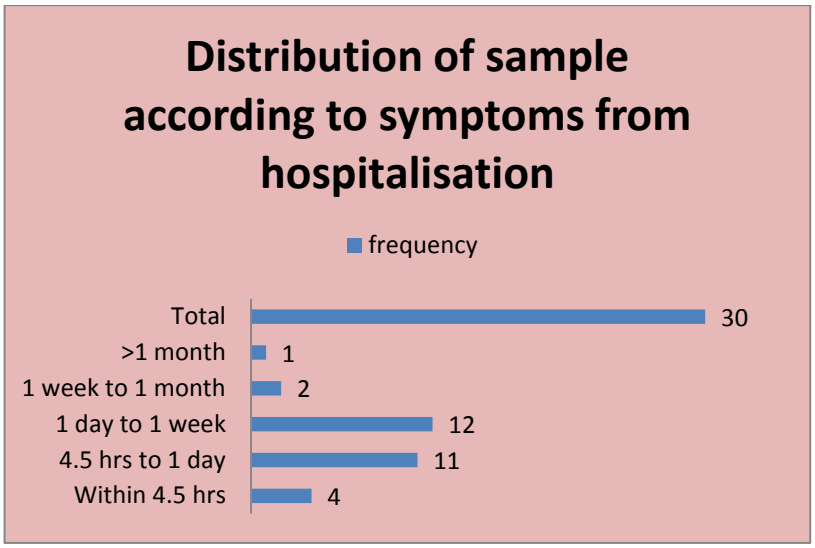

Figure 4.15 Bar diagram shows distribution of sample according to Time from symptoms to hospitalization.

4.16 Distribution of sample according to NIHSS score on admission

NIHSS score on admission ranges from 1 to 38 with a mean of 9.2 and a median of 6.

4.17 Distribution of sample according to NIHSS score at discharge

NIHSS score at discharge ranges from 1 to 38 with a mean of 9.03 and a median of 6.

4.18 Distribution of sample according to outcome

Table 4.18Distribution of sample according to outcome

Outcome	Frequency	Percentage
Discharged	25	83.3%
Expired	5	16.7%
Total	30	100%

Table 4.18 shows that 16.7% of patients were expired.

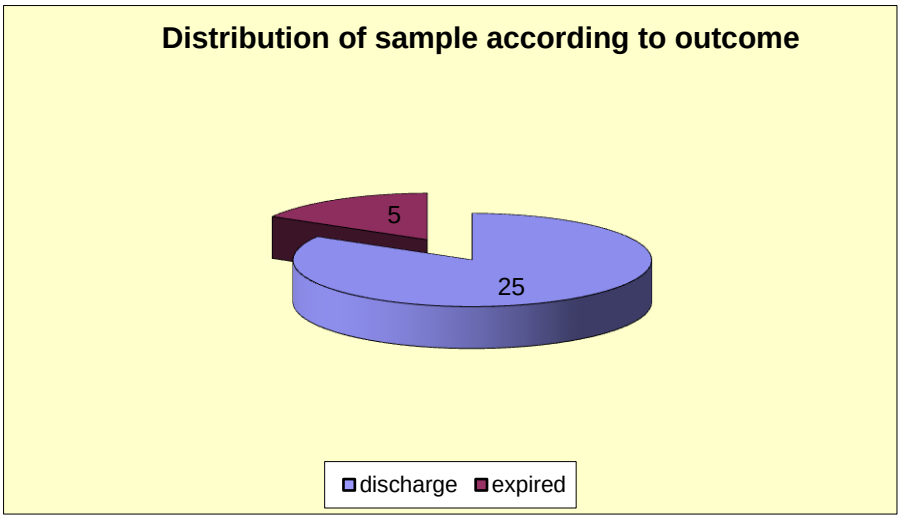

Figure 4.18 pie diagram shows distribution of sample according to outcome.

Table 4.18 (a) Distribution of sample according to selected variables

Variables	**Frequency**	**Distribution**
Time of onset		
Day	21	70
Night	9	30
Total	30	100
Age of Decision maker		
<40 yrs	18	60
>|=40 yrs	12	40
Total	30	100
Mode of transportation		
(1)To local hospital		
Ambulance	1	3.3
Taxi	26	86.7
Private vehicle	3	10
Total	30	100
(2) To SCTIMST		
Ambulance	13	43.3
Taxi	17	56.7
Total	30	100
Initial Symptoms		
1.Headache	3	10
2.Loss of speech\trouble talking	1	3.3
3.Vision changes\loss of vision	2	6.7
4.Weakness\numbness of arms\legs	18	60
5.2&4	4	13.3
6.Fond unconscious	2	6.7
Total	30	100

Table 4.19 Relation between predictor variables and hospital arrival time

Predictor variables	Hospital arrival time Within 4.5 hrs (To SCTIMST)	Hospital arrival time > 4.5 hrs (To SCTIMST)	Total Frequency (%)	P value
Age of decision maker				
<38 yrs	10(71.4%)	4(28.6%)	14(46.7%)	0.21
>38 yrs	8(50%)	8(50%)	16(53.3%)	
Distance from hospital				
<10 km	0	5(100%)	5(16.7%	0.46
>10 km	4(16%)	21(84%)	25(83.3%)	
Feel something wrong				
During initial symptoms	4(21.4%)	15(78.9%)	19(63.3%)	0.14
After worsening of symptoms	0	11(36.7%)	11(36.7%)	

Bivariate analysis shows that there is no significant relation between age of decision maker, distance from hospital, and feeling of seriousness of the disease and arrival time to SCTIMST.

Table 4.19(a) Relation between predictor variables and hospital arrival time

Predictor variable	Arrival time to local hospital Within 4.5 hrs	Arrival time to local hospital >4.5 hrs	Total Frequency (%)	P Value
Feel something wrong	17(89.5%)	2(10.5%)	19(63.3%)	0.000
During initial symptoms	1(9.1%)	10(90.9%)	1136.7%)	
After worsening of symptoms				

Bivariate analysis shows that there is a significant relation between Feeling something wrong to local hospital arrival time. Patients often admitted in the local hospital for some days and after that they are referred to SCTIMST .By that time the "golden hour" will be over.

4.20 Summary

This chapter deals with analysis and interpretation of data collected from 30 stroke patients admitted in stroke ICU, SCTIMST, Trivandrum. Descriptive statistics were used for analysis. Bar and pie diagram were used to illustrate the findings of the study.

Chapter - 5
SUMMARY, CONCLUSIONS, DISCUSSIONS AND INTERPRETATIONS

5.1 Introduction

A brief account of the study is given in this chapter, which cover objectives, findings of the study and possible application of the result. Recommendation for future research and suggestion for improving the present study are also presented.

5.2 Summary

This study was conducted with the objectives to identify the factors associated with the hospital arrival time for stroke patients and to assess the influence of these factors in seeking medical attention after stroke. A review of related research literature helped the investigator to get a clear concept about the topic undertaken, as well as to develop tools, methodology of the study and to decide plan of data analysis.

The study was conducted in Stroke ICU and General medical wards of SCTIMST, Trivandrum: the size of sample was 30.Patients admitted with the diagnosis of stroke are included in this study. The duration of the study was from September 2011 to October 2011. A self-prepared questionnaire was used for collecting the data. It contains demographic data such as patient's name, age, sex, marital status. category, occupation, date of admission, NIHSS score on admission, level of consciousness, distance from hospital, place of living, comorbidities, bad habits, time of onset of stroke, family history of stroke and previous history of stroke and questions regarding initial symptoms, time of onset, threat perception, local doctor contact, mode of transportation, knowledge

about stroke warning signs and treatment and time of arrival. The data was interpreted and analyzed using descriptive statistics.

5.3 Objectives of the study

The objectives of the study were

To identify the factors associated with hospital arrival time for stroke patients

To assess the influence of these factors in seeking medical attention for these patients

5.4 Limitation

The study is was limited to stroke patients admitted in stroke ICU and GMW of SCTIMST, Trivandrum. Sample size is only 30.

5.5 Major findings of the study

The present study was conducted among 30 stroke patients (22 males, 8 females) admitted in stroke ICU and GMW of SCTIMST, Trivandrum. All the patients were with ischemic stroke. Of the 30 patients, 70 % were above 60 yrs. Majority of patients (53.3%) were living in village and 50% were living >50 km from the hospital. It has been found that 76.7% of patients had at least one risk factor for stroke. 56.7% had DM, 56.7% with HTN, 43.3% had hypercholesterolemia, 16.7% had CAD, 30% had smoking, 30% with alcoholism, 10% had increased fat consumption. In 70% of patients the time of onset was during the daytime. Majority of patients did not have a previous (86.7%) and family (96.7%) history of stroke. Of the 30 patients only one patient perceived the initial symptoms as stroke. Majority of the patients (46.7%) didn't know the exact reason. 63.3% felt something wrong during the initial symptoms. But majority of the patients (93.3%) had a low threat perception. 86.7% of patients didn't know warning signs of stroke and 96.7% didn't know the

treatment of acute stroke. In 90% of patients the decision makers were family members and in 10% the decision maker were the patient himself. All the patients except one were living with family .One patient was living alone. NIHSS score on admission ranged from 1 to 38 with a mean of 9.2. In majority of patients (60 %) the initial symptom was weakness or numbness of arms or legs. Only one patient arrived to local hospital by ambulance and only 43.3% used ambulance for reaching SCTIMST. Time from symptoms to decision making ranged from 0.45 min to 2880 hrs with a mean of 112.59 hrs. Time from symptoms to hospitalization ranged from 1.5 hrs to 3240 hrs with a mean of 153 hrs. All the patients had local doctor contact. Only 4 patients reached SCTIMST within 4.5 hrs and among them 3 received tPA. One patient was excluded due to (lt) MCA stenosis. 20% of patients required mechanical ventilation. 16.3% of patients were expired. The mean NIHSS score on discharge was 9.03.

5.6 Recommendations for future study

Keeping in mind the findings and limitations of the study, the following recommendations were made for future research.

1. Similar study can be repeated including other hospital
2. Similar study can be repeated by increasing size of the sample.

5.7 Discussion

There are many studies related to factors associated with hospital arrival time After stroke. Delay in arrival of acute stroke cases may be caused by organizational, educational, geographical, and demographic factors. Organizational, educational and geographic factors have somewhat predictable effect on admission time, however, influence of demographic and medical factors have unpredictable impact. (Srivastava et al 2001). This study has included both predictable and nonpredictable factors. In the present study it has been found that lack of knowledge about warning signs of stroke ,treatment, low threat perception, local doctor contact are associated with delay in arrival after stroke. Kim et al (2011)

conducted a study to investigate factors associated with prehospital delay after acute ischemic stroke in Korea. Researchers found that among the 500 patients (median 67 years, 62% men), the median time interval from symptom onset to arrival was 474 minutes (interquartile range, 170-1313). Early arrival within 3 hours of symptom onset was significantly associated with the following factors: high National Institutes of Health Stroke Scale (NIHSS) score, previous stroke, atrial fibrillation, use of ambulance, knowledge about thrombolysis and awareness of the patient/bystander that the initial symptom was a stroke. Researchers concluded that, stroke awareness not only on the part of patients, but also of bystanders, had a great impact on early arrival at hospital. Daniel et al (2008) conducted a population based prospective incidence study to assess the influence of general practice opening hours on healthcare seeking behaviour after transient ischaemic attack (TIA) and minor stroke and feasibility of clinical assessment within 24 hours of symptom onset. The researchers concluded that general practitioner's opening hours influence patients' healthcare seeking behaviour after TIA and minor stroke. Current opening hours can increase delay in assessment. Improved access to primary care and public education about the need for emergency care are required if the relevant targets in the national stroke strategy are to be met. Siddiqui et al (2008) found that only 28.5% of the patients came within three hours while 71.5% after three hours. Attendants of 47 patients had a low throat perception, 53 (32%) of the patients did not know a single symptom of stroke and 63% (104) patients first contacted their General Practitioner who referred them to hospital. Similarly 60.6% of patients wore first taken to a local hospital not equipped to handle major emergencies. The researchers concluded that time elapsed from onset of symptoms to hospital arrival is influenced by lack of knowledge of stroke symptoms, contact with a local doctor, low threat perception and non availability of ambulance services. Chen et al (2007) conducted a prospective study to investigate the time lags and the factors causing pre-hospital and emergency department (ED) delay during acute ischemic stroke attack. The researchers concluded that organization of a stroke team and standardized stroke pathways may help to shorten in-hospital time consumption. Educational efforts

should not only focus on the public, but also on the training of ED physicians and other medical personnel. Pandian et al (2006) concluded that both local physicians and the public should be educated about the importance of an early referrals and presentation to the stroke centers. Srivastava et al (2001) found that distance from hospital, contact with a local doctor and low threat perception of symptoms of stroke were independent factors associated with delay in arrival. The researchers concluded that adequate measures need to be taken to improve the public awareness of stroke and the role of local doctors. Yoon et al (2001) concluded that a community-based education program to increase public knowledge of stroke may contribute to reducing the risk of stroke and to increasing the speed of hospital presentation after the onset of stroke. Kothari et al (1997) found that almost 40% of patients admitted with a possible stroke did not know the signs, symptoms, or risk factor of a stroke. Further public education is needed to increase awareness of the warning signs and risk factors of stroke.

5.8 Conclusion

Based on the findings of the study the following conclusions were drawn. Lack of knowledge about warning signs of stroke, treatment, low threat perception, and local doctor contact are associated with delay in arrival after stroke. In this study only 13.3% of patients reached to SCTIMST within 4.5 hrs. 93.3% of patients had low threat perception. 76.7% had at least one risk factor for stroke. 86.7% didn't know warning signs of stroke. 96.7% didn't know treatment of stroke. These findings indicate that public don't have adequate knowledge regarding stroke, its risk factors, warning signs, treatment, and seriousness of the condition. Contact with a local doctor after acute stroke had an association with delay after acute stroke. This has been noticed in previous studies also. (Srivastava et al 2001, Daniel et al 2008, Siddiqui et al, Pandian et al 2006). In our country, it could be due to large number of unqualified practitioners and also ignorance of qualified practitioners about the need to transfer the patient to an organized stroke care center.(Srivastava et al 2001).

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INFORMED CONSENT

I,…… hereby agree to participate in the research study, to assess the factors associated with hospital arrival time for stroke patients, conducted by Ms. REMYA.S.S, 1'st yr Diploma in Neuronursing, of Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum. I understand that there will not be any change in the nature of care I receive and the data given by me will be kept confidential, and will be used only for research purpose.

Signature of the participant

……

Date:…….

Questionnaire to assess the hospital arrival time for stroke patients

Demographic data: -

1) Name

2) Age

3) 1. Male 2. Female

4) Married, Unmarried, Widow, Divorcee

5) Place

1. Town 2. Village

6) Educational qualification

1. Primary 2. Secondary 3. Graduation

7) Living with

1. Family 2. Friends 3. Alone

8) Occupation

1. Yes 2. No

9) Distance from hospital

10) Any comorbidities

1. Hypertension 2. Diabetes mellitus 3. CAD 4. Hypercholesterolemia

11) Do you have any of these habits given below?

1. Alcoholism 2. Smoking 3. increased fat consumption

12) Time of onset

1. Night 2. Day

13) Do you have previous history of stroke?

1. Yes 2. No

14) Do you have any family history of stroke

1. Yes 2. No

Category

Type of stroke

(ischemic / hemorrhagic)

Date & time of admission

Level of consciousness

(Conscious/ Unconscious)

NIHSS Score on admission

Information regarding factors associated with hospital arrival time for stroke patients

1. When did you first experience the symptoms and what are they?
2. What did you think might be the cause?
3. When did you feel something was wrong?
4. Did you think the symptoms will resolve spontaneously?
5. Did you have any prior knowledge of warning signs of stroke and what are they?
6. Did you think you were having a stroke from your initial symptoms?
7. Did you feel any urgency to get to the hospital quickly?
8. When did you decide you needed to go the hospital?
9. Who made the decision to come to the hospital?
10. What is the age, educational qualification and occupation of decision maker?
11. Who were with you when you decided to come to the hospital?
12. Did you consult your family or local doctor and how did you reach there?
13. Was there easy availability of transport?

14. How did you reach this hospital?

15. When did you arrive at this hospital?

16. Did you know any treatment available for stroke patients?

Treatment received

NIHSS Score at discharge

Date of discharge or death

സമ്മതപത്രം

പക്ഷാഘാതരോഗികളെ ആശുപത്രിയിലെത്തിക്കുതുമായി ബന്ധപ്പെട്ട ഘടകങ്ങളെക്കുറിച്ച് പഠിക്കുന്നതിന് തിരുവനന്തപുരം ശ്രീ ചിത്ര തിരുനാൾ ആശുപത്രിയിലെ ഒന്നാം വർഷ ഡിപ്ലോമ ന്യൂറോ നേഴ്സിംഗ് വിദ്യാർത്ഥിനിയായ രമ്യ.എസ്.എസ്. നടത്തുന്ന പഠനത്തിൽ സഹകരിക്കാൻ ഞാൻ സമ്മതിക്കുന്നു. എപ്പോൾ വേണമെങ്കിലും ഈ പഠനത്തിൽ നിന്ന് എനിക്ക് പിന്തിരിയാമെന്നും, എന്റെ സഹകരണമോ, നിസ്സഹകരണമോ എനിക്ക് ലഭിക്കുനന് ശുശ്രൂഷയെ ബാധിക്കുകയില്ലെന്നും ഞാൻ മനസ്സിലാക്കുന്നു.

ഒപ്പ്

വിവരം നല്കുന്ന വ്യക്തിയുടെ പേര്

സ്ഥലം

തീയതി

പക്ഷാഘാത രോഗികളെ ആശുപത്രിയിലെത്തിക്കുന്നതുമായി ബന്ധപ്പെട്ട ഘടകങ്ങളെക്കുറിച്ചുള്ള അഭിമുഖ സംഭാഷണത്തിന്റെ ചോദ്യാവലി.

വ്യക്തി വിവരം

1. പേര്
2. വയസ്സ്
3. 1. ആൺ 2.പെൺ
4. വിവാഹിത(ൻ) അവിവാഹിത(ൻ) വിധവ, വിഭ്യാര്യൻ
5. താമസസ്ഥലം

   1. നഗരം ☐ 2. ഗ്രാമം ☐

Category

Type of stroke

(ischemic/haemorrhagic)

Date & Time of Admission

Level Consciousness

(Conscious/Unconscious)

NHSS Score on admission

Weight

Height

6. വിദ്യാഭ്യാസ യോഗ്യത

1.. സ്കൂൾ വിദ്യാഭ്യാസം ☐ 2. പ്ലസ്ടു ☐
3. ബിരുദം ☐ 4. ഉന്നത ബിരുദം ☐

7. ആരോടൊപ്പമാണ് തമസിക്കുന്നത്

1. കുടുംബം ☐ 2. സുഹൃത്തുക്കൾ ☐
3. തനിച്ച് ☐

8. തൊഴിൽ

1. ഉണ്ട് ☐ 2. ഇല്ല ☐

9. ആശുപത്രിയിൽ നിന്നുള്ള ദൂരം

10. മറ്റെന്തെങ്കിലും അസുഖമുണ്ടോ?

1. രക്താതിസമ്മർദ്ദം ☐ 2. പ്രമേഹം ☐
3. ഹൃദയസംബന്ധമായ അസുഖങ്ങൾ ☐
4. രക്തത്തിൽ ക്രമാതീതമായ കൊഴുപ്പിന്റെ അളവ്☐ 5. മറ്റുള്ളവ. ☐

11. താഴെപ്പറയുന്നവയിൽ ഏതെങ്കിലും ശീലങ്ങളുണ്ടോ?

1. മദ്യപാനം ☐ 2. പുകവലി ☐
3. കൊഴുപ്പിന്റെ അമിത ഉപയോഗം ☐ 4. വ്യായാമക്കുറവ് ☐
5. അമിതവണ്ണം

12. എപ്പോഴാണ് പക്ഷാഘാതമുണ്ടായത്.

1. രാത്രി ☐ 2. പകൽ ☐

13. മുൻപ് പക്ഷാഘാതം ഉണ്ടായിട്ടുണ്ടോ?

1. ഉണ്ട് ☐ 2. ഇല്ല ☐

14. കുടുംബത്തിൽ ആർക്കെങ്കിലും പക്ഷാഘാതമുണ്ടായിട്ടുണ്ടോ?

1. ഉണ്ട് ☐ 2. ഇല്ല ☐

പക്ഷാഘാതരോഗികളെ ആശുപത്രി.യിലെത്തിക്കുന്നതുമായി ബന്ധപ്പെട്ട ഘടകങ്ങളുടെ വിവരം

1. എപ്പോഴാണ് ആദ്യമായി രോഗലക്ഷണങ്ങൾ കണ്ടു തുടങ്ങിയത്? അവ എന്തൊക്കെയായിരുന്നു?

2. കാരണമെന്തായിരിക്കാമെന്നാണ് നിങ്ങൾ കരുതി.യത്?

3. അസ്വഭാവികത തോന്നിതുടങ്ങിയത് എപ്പോഴായിരുന്നു.?

4. രോഗലക്ഷണങ്ങൾ ഉടനെ ഭേദമാകുന്നത് നിങ്ങൾ കരുതിയിരുന്നോ?

5. പക്ഷാഘാതത്തിന്റെ മുന്നറിയിപ്പ് ലക്ഷണങ്ങളെകുറിച്ച് നിങ്ങൾക്ക് എന്തെങ്കിലും അറിവുണ്ടായിരുന്നോ? ഉണ്ടെങ്കിൽ അവ ഏതൊക്കെ?

6. രോഗലക്ഷണങ്ങൾ ആദ്യം കണ്ടപ്പോൾ തന്നെ അത് പക്ഷാഘാതമാണെന്ന് നിങ്ങൾ വിചാരിച്ചിരുന്നോ?

7. ആതുര സേവനം ഉടനെ ലഭ്യമാക്കേണ്ടത് അത്യാവശ്യമാണെന്ന് നിങ്ങൾക്ക് തോന്നിയിരുന്നോ?

8. നിങ്ങൾ ആശുപത്രിയിലേക്ക് വരാൻ എപ്പോഴാണ് തീരുമാനിച്ചിത്?

9. ആരാണ് ആശുപത്രിയിൽ വരാനുള്ള തീരുമാനമെടുത്ത്?

10. തീരുമാനമെടുത്തയാളുടെ വയസ്സ്, വിദ്യാഭ്യാസയോഗ്യത, തൊഴിൽ ഇവ എന്ത്?

11. ആശുപത്രിയിൽ പോകാൻ തീരുമാനിച്ചപ്പോൾ നീങ്ങളോടൊപ്പം ആരൊക്കെയുണ്ടായിരുന്നു.

12. നിങ്ങൾ നിങ്ങളുടെ കുടുംബ ഡോക്ടറിനെയോ സമീപത്തുള്ള ഡോക്ടറിനെയോ സമീപിച്ചിരുന്നോ? ഉണ്ടെങ്കിൽ എങ്ങനെയാണ് അവിടെ എത്തിയത്?

13. ഗതാഗതസൗകര്യം എളുപ്പത്തിൽ ലഭ്യമായിരുന്നോ?

14. നിങ്ങൾ എപ്പോഴാണ് ഈ ആശുപത്രിയിൽ എത്തിച്ചേർന്നത് എങ്ങനെയായിരുന്നു?

15. നിങ്ങൾ എപ്പോഴാണ് ഈ ആശുപത്രിയിൽ എത്തിച്ചേർന്നത്?

16. പക്ഷാഘാതരോഗികൾക്ക് ലഭ്യമാകുന്ന ചികിത്സകളെകുറിച്ച് നിങ്ങൾക്കെന്തെങ്കിലും അറിവുണ്ടായിരുന്നോ?

Treatment Receive
NIHSS Score at discharge
Date of Discharge