

Awareness of Hypertensive Patients on Precautions of Stroke: A Cross Sectional Descriptive Study Conducted in Teaching Hospital Batticaloa, Sri Lanka

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Abstract: Stroke is a worldwide health problem and a major contributor to morbidity, mortality and disability in both developing and developed countries. It is the third commonest cause of death world-wide and the single largest cause of adult disability. The recognition of stroke symptoms by the public and activation of the Emergency Medical Services are the most important factors in initiating pre-hospital stroke. This study aimed to assess the knowledge regarding stroke among hypertensive patients who were attending clinic. A cross sectional descriptive study was conducted for one year among 269 hypertensive patients. After obtaining written consent, data were collected using a pre tested interviewer administered questionnaire. Frequencies, percentage and associations were calculated. Only 5.6 % hypertensive patients (n=15) had good knowledge, while many of them (n=151) 56.1% had adequate knowledge regarding stroke. The most common risk factors identified were hypertension (79.2%), hyperlipidemia (40.1%) and diabetes mellitus (37.9%). Sudden numbness (85.1%), weakness or paralysis of face, arms and limbs (67.3%) and trouble speaking (66.2%) were the commonly identified sign and symptoms and paralysis (92.2%) was the most identified complication. Regarding the immediate measures after stroke occurrence, 84.4% of the participants told that they will take the victim to the hospital. There was a significant association ($p < 0.05$) between the knowledge of stroke and the following background characteristics; education, occupation, income, duration of hypertension and duration of hypertensive clinic follow up. Knowledge on stroke among the patients was satisfactory in many aspects and this study will pave a way to the prevention of stroke among hypertensive patients.

Keywords: hypertension, stroke, knowledge.

I. INTRODUCTION

A. Background

Stroke, cerebro vascular accident, or brain attack can be defined as the onset and persistent of neurologic dysfunction, result in from disruption of blood supply to the brain and indicates infarction rather than ischemia. Stroke is classified as ischemic or hemorrhagic [1]. Being a worldwide health issue and a major contributor to morbidity, mortality and disability in both developing and developed countries, stroke is considered as life threatening consequence of hypertension [2]. As the third commonest cause of death world-wide and the single largest cause of adult disability, over 15 million persons suffer a stroke every year and of these, 6 million die and 5 million are left permanently disabled. 85% of global deaths from stroke occur in the developing countries [3], [4], [5]. The World Health Organization (WHO) estimates show that about 17.3 million people died of cardiovascular diseases in 2012, representing 31% of all global deaths. Of these deaths, an estimated 7.4 million were due to coronary heart diseases and 6.7 million were due to stroke [2]. Due to ageing populations worldwide, it has been estimated that by 2020 stroke will be the leading cause of lost healthy life-years [6].

There are many causes which lead to the onset of stroke such as therapeutic, physiological and behavioral risk factors which can be hypertension, smoking, hypercholesterolemia, excessive alcohol consumption and diabetes mellitus [7], [8]. High blood pressure, also termed as hypertension is a condition that afflicts almost 10 billion people worldwide and is a leading cause of mortality and morbidity. Therefore, this disease is often referred as a “Silent Killer.” In most of the situations, this disease remains asymptomatic until severe, to express one of the following outcomes; stroke, myocardial infarction, renal dysfunction, visual problems and others. So, hypertension is stated as the major risk factor for stroke, coronary artery disease and myocardial infarction [9].

Among all the risk factors, many studies have proved that hypertension is the major cause for the occurrence of stroke [3], [7], [8], [9], [10]. The World Health Organization reports that 62% of strokes are related to poor blood pressure control, while adequate treatment of hypertension is associated with 35% to 40% reduction in stroke incidence [11], [12]. WHO (2017) defined hypertension as high or raised blood pressure, and a condition in which the blood vessels have persistently raised pressure. A healthy person should maintain his systolic blood pressure less than 120mmHg and diastolic blood pressure less than 80mmHg. Elevated blood pressure is defined as systolic blood pressure from 120 to 129mmHg and diastolic blood pressure less than 80mmHg. Stage 1 hypertension is defined as systolic blood pressure from 130 – 139mmHg and diastolic blood pressure from 80 – 89mmHg and stage two hypertension can be defined as systolic blood pressure more than 140mmHg and diastolic blood pressure more than 90mmHg [13]. High blood pressure is one of the most common causes of stroke as it strains blood vessel walls causing them to thicken and deteriorate [9]. Symptoms of the onset of stroke can be headache, numbness, weakness, or loss of motor ability, dysphagia, aphasia, lack of acknowledgement of one side of the sensory field, hemianopia, double vision, photophobia, altered cognitive abilities, psychological affect and self-care deficits. Clinical manifestation varies depending on the vessel affected and the cerebral areas of perfusion [1], [14].

Rapid reperfusion with thrombolytic agents within 3 hours of the onset of symptoms has been shown to be beneficial as such and to reduce morbidity and mortality [14], [15], [16]. It can cause many complications which can threaten the entire life of a person. Aspiration pneumonia, dysphagia, spasticity, contractures, deep vein thrombosis, pulmonary embolism, brain stem herniation, post stroke depression and death can be some of them [1].

Awareness of stroke is the major part of preventing the prevalence and complications of stroke. The recognition of stroke symptoms by the public and activation of the Emergency Medical Services (EMS) are the most important factors in initiating pre-hospital stroke care. Studies have suggested that, poor recognition of the warning signs of stroke is the main cause of delay in accessing the EMS [6], [14], [17], [18]. However, many patients are seen too late to benefit from early treatment, often because of a lack of knowledge or awareness of stroke symptoms [19]. Community attitudes and knowledge influence stroke prevention, including risk factor identification and management, as well as community and individual response to stroke symptoms when they occur [3], [16] [18].

The recent studies conducted worldwide on stroke awareness have been given an idea on the degree of knowledge in different parts of the world and some went a step ahead in showing the factors that contributed to low knowledge and the best source of information for this population [19]. A study which was done in Kelaniya Medical Officer of Health (MOH) area in Sri Lanka proved that only 0.7% of the population had very good knowledge about stroke [8]. A quantitative approach and a descriptive survey design about assessment of knowledge on risk factors and warning signs of stroke among patients with hypertension in selected villages in Kancheepuram district in India showed that none of them had adequate knowledge regarding stroke [9]. A descriptive study was conducted among 114 hypertension patients who attended chronic disease center in Sulaimani city in Iran. It showed that patients’ knowledge regarding stroke lifestyle risk factors and stroke warning signs were low of 55.3% and 76.3% respectively [20]. Of the 56.4 million deaths worldwide in 2015, more than half (54%) were due to the top 10 causes. Ischemic heart disease and stroke are the world’s biggest killers, accounting for a combined 15 million deaths in 2015. These diseases have remained as the leading causes of death globally in the last 15 years [21].

In Sri Lanka, the aging population is gradually increasing and the causes for annual hospital deaths due to cerebrovascular diseases and hypertension are in 6th and 12th place respectively [22]. According to the statistics, the distribution of chronic illness (as a percentage to the total cases reported) hypertension is in the first place with 39% and stroke is in the seventh place with 2.1%. Among the persons having any chronic illness many are reported from the age groups 25 – 59 years (48.1%) and age 60 and above (45.3%). The distribution pattern is almost similar for both male and female. If we consider the prevalence of chronic illness by age, hypertension is in the 2nd place which is 6.9% in total population and 9.2% in

population who are 15 years and above. At the same time in Batticaloa district the hypertension above age 15 is 7% and it is 5% among total population. Stroke is in the 4th place among the prevalence of chronic diseases by age and it is 0.4% in total population and in above 15 years it is 0.5%. In Batticaloa district it is 0.51% in the total population of Batticaloa [23]. Prevalence of stroke by district statistics says that Batticaloa, Anuradhapura and Kegalle are the highest and it is 0.5 to 0.74. The prevalence of high blood pressure by age group (per 10000 population) is 6 persons below the age of 15, 15 persons between the age of 15 – 24, 57 persons between the age of 25 – 34, 315 persons between the age group of 35 – 44, 1059 persons between the age of 45 – 54, 1959 persons between the age 55-64 and 3042 persons above the age of 65 [23]. Prevalence of hypertension among working population statistics says that 0.1% are affected between 15 to 24 years of age, 6.3% are affected between the age of 25 – 59 and 27.3% are affected above 60 years[23]. So proper knowledge regarding stroke can make a massive change in the early prevention and early management of the stroke among the public.

This study was aimed to assess the knowledge regarding stroke among hypertensive patients attending Medical Clinic at Teaching Hospital Batticaloa, Sri Lanka to determine the knowledge regarding signs and symptoms, causes, treatment measures, complications of stroke and the prevention of complications following a stroke for the purpose of identifying the areas in which the people have lack of knowledge and strategies to educate on prevention of stroke.

II. METHODOLOGY

A. Study design

The study design was a Cross Sectional Descriptive Study. conducted in the medical clinics in Teaching Hospital Batticaloa (THB) for 12 months in 2018. There were five medical clinics and our plan was to get the sample from all the five clinics. As we were able to get the permission from four medical clinics, the data was collected from those four clinics only.

B. Participants

The population consist of hypertensive patients who were attending the medical clinic in Teaching Hospital Batticaloa during one month of time period and who were between 25 to 70 years of age. Both male and female hypertensive patients who were willing to participate in the study on the day of visit were included under the research study. There were no specific exclusion criteria for this study.

Among the hypertensive patients who were attending the medical clinic of Teaching Hospital Batticaloa, 269 patients were selected for the study. The total sampling size was calculated according to the Krejcie & Morgan formula [24].

Formula used for determining sample size was $s = X^2NP(1 - P) \div d^2(N - 1) + X^2P(1 - P)$.

For this study, s is the required sample size, X^2 is the table value of chi square for 1 degree of freedom at the desired confidence level (3.841), N is the population size. As there was no a definite population size, an estimated population size (900) was considered. The population proportion P was assumed to be 0.50 since this would provide the maximum sample size and the degree of accuracy expressed as a proportion d (0.05). Systematic sampling method was used in this study. Every 3rd hypertensive patient was included in the study. The estimated population size was 900; because per day, according to the medical records, 30 hypertensive patients were present and we did the data collection for 30 days. So the sample size for this study has been calculated as 269 every 3rd patient of the visit was enrolled in this study.

C. Procedures

Ethics Review Committee of the Faculty of Health-Care Sciences of Eastern University Sri Lanka granted ethical clearance to this study. A pretested, interviewer administered questionnaire was used to collect the data on socio demographic details, hypertensive history, knowledge on stroke sign and symptoms, risk factors, treatment, complications and prevention of complications among hypertensive patients. The administration of the interviewer administered questionnaire for the collection of data was carried out by researchers after getting informed consent and permission from authorities. A suitable time and duration, comfortable environment and needed facilities were arranged to the participants.

D. Statistical Analysis

A scoring system was used to poor, adequate and good knowledge levels. The percentage of knowledge, the mean knowledge level and the standard deviation were obtained through descriptive analysis. The magnitudes of associations of the risk factors were identified using Chi square tests.

III. RESULTS AND DISCUSSION

Stroke awareness is a key determinant of health promoting behavior. Life style modification and risk factor control are the cornerstones of stroke prevention, and these are dependent on awareness of modifiable risk factors and healthy life style changes. Awareness of warning symptoms and the need for early treatment are important for early symptom recognition and early hospital admission. Studies on stroke awareness have been conducted in many parts of the world, but only a few reports are available from South Asia [8]. Knowledge about stroke and its management is an important step to prevent major complications. Awareness is important as because informed people are more likely to have better compliance. Once awareness is created people are more likely to participate in preventive and management programmes.

A. Demographic Details of participants

A total of 269 patients were participated in this study. Nearly 67% were female and 47% patients were between 60 – 70 years age group. Among the patients, majority 64% were from rural area. Around 77 % of the patients were Tamil and 55 % were Hindu. Majority of the patients 82% were married. Majority of the patients 73% had completed primary education. Most of the patients 60% were unemployed and 82.2 % (n=221) were married.

Table 1: Details of hypertensive history

Variable (n=269)	n	Percentage (%)
Duration of hypertension		
<01years	59	21.9
01year- <05 years	102	37.9
>05 years	108	40.2
Duration of clinical follow-up		
<01years	73	27.1
01- <03 years	64	23.8
> 03 years	132	49.1

Nearly 40% of the patients were diagnosed as hypertensive patients for more than 05 years. Nearly half of them 49 % were following the regular clinic for more than three years (table 1).

B. Knowledge of hypertensive patients

Awareness on risk factors, early recognition of signs and symptoms of stroke, treatment methods and measures known in minimizing complication are discussed. Considering risk factors, 79% mentioned hypertension as the major risk factor for stroke while least number of patients 22 % identified physical inactivity as a risk factor. Hyperlipidemia 40 %, diabetes mellitus 38 % and aging 38 % were in the second third and fourth position respectively (table 2). In overall knowledge of stroke among patients, only 5.6 % (n=15) had good knowledge while more than half of them, 56.1 % (n=151) had adequate knowledge level and 38.3% (n=103) had poor knowledge (table 3).

Table 2: Knowledge on risk factors of stroke

Variable (n=269)*	n	Percentage (%)
Hypertension	213	79.2
Hyperlipidemia	108	40.1
Diabetes mellitus	102	37.9
Heart diseases	67	24.9
Smoking and tobacco consumption	70	26.0

Heavy alcohol consumption	72	26.8
Physical inactivity	59	21.9
Obesity	80	29.7
Ageing	101	37.5

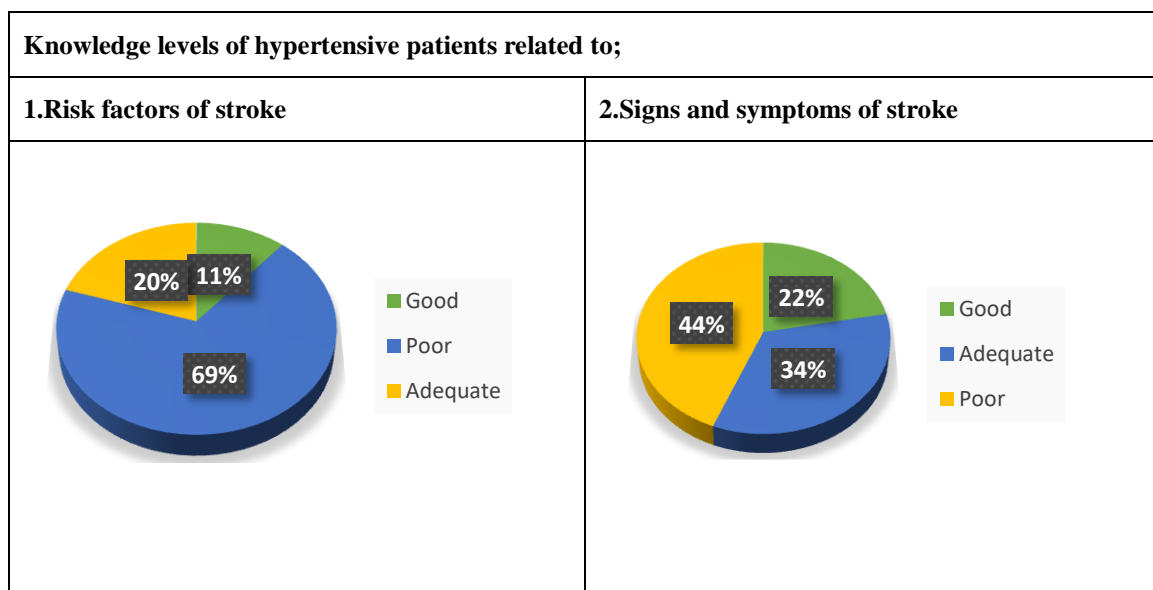
* Multiple responses were allowed

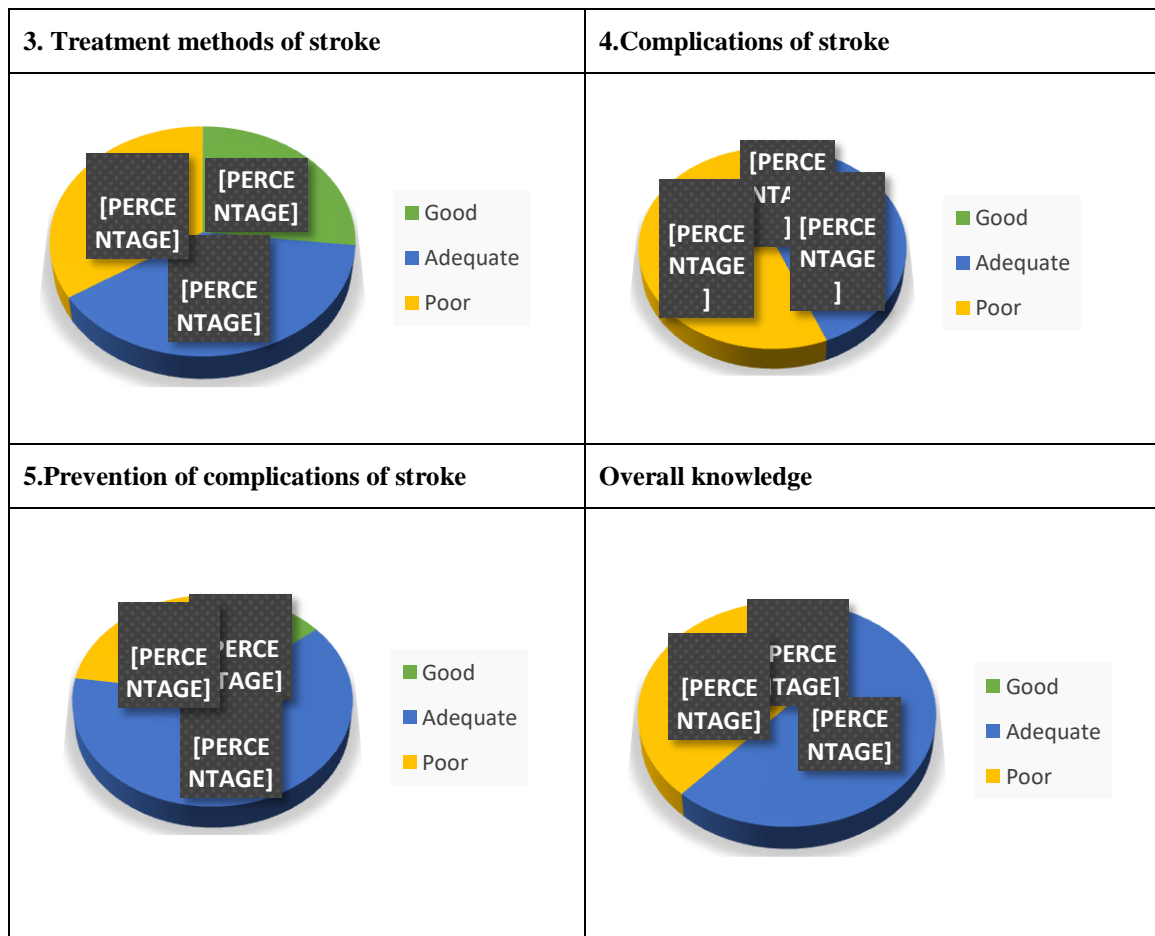
Regarding the risk factor knowledge, only 11.2% (n=30) of the patients had good knowledge while poor 68.8% (n=185) was relatively high. The percentage of adequate knowledge regarding risk factors was 20.1% (n=54). Only 21.9% (n=59) had good knowledge regarding the sign and symptoms while 34.2% (n=92) had adequate knowledge. Majority of the patients 43.9% (n=118) had poor knowledge regarding the sign and symptoms (table 3).

In the present study, smoking (26%), alcohol (26.8%), obesity (29.7%) and physical inactivity (21.9%) were considered as minor risk factors while in a Berlin study and in an Iran study they were considered as major risk factors for hypertension [20], [25]. Previous studies have highlighted deficiencies in knowledge regarding early stroke symptoms. Unilateral weakness, perhaps the best known of all stroke symptoms, was recognized as a stroke symptom by only a few respondents (6-15%) in some studies [26], [27]. In a Sri Lankan study many patients (30-66%) were unable to recognize at least one of the common stroke warning symptoms [8].

Knowledge on early detection of signs and symptoms of stroke was assessed. The common sign and symptoms of stroke known to the study patients were sudden numbness 85%, weakness or paralysis of face, arms and limbs 67% and trouble speaking 66% (figure 1). This study reveals a higher percentage of the subjects recognized numbness (85.1%), weakness or paralysis (67.3%) and trouble speaking (66.2%) as the major sign and symptoms of stroke while sudden confusion (33.5%), sudden headache (31.6%) and vision impairment (27.1%) were considered as minor symptoms. Stroke may manifest with any symptom. So the patient must be aware of every symptom in order to recognize early and take immediate corrective measures. In an Australian study, an Iranian study (Rashid, 2016) and in the integrative review of the evidence study Jones et al., (2009), they say that the most commonly identified sign and symptoms were numbness and paralysis [6], [28], [20]. This is coherence to our study's major symptoms. But a Nigerian study findings are not coherent with this study. The knowledge level regarding sign and symptoms of stroke was good in 21.9%, adequate in 34.2% and poor in 43.9% in this study but in the Nigerian study, 87% had good knowledge regarding the sign and symptoms [2].

Table 3: Knowledge levels of hypertensive patients





Considering the immediate treatment measures after stroke occurrence, 84% of the patients told they will take the victim to the hospital during the occurrence of the stroke. Only 33 % told that stroke can be completely treated while 67 % told that it can't be fully treated. Among the patients who told that stroke can be completely treated 33 %, 30 told % told that it can be completely treated if we take the victim immediately or within 03 hours of occurrence of stroke. Regarding the usage of an injection to treat stroke majority 83% of the patients are unaware and only 18 % knows that stroke can be treated with an injection. Majority of the study patients 72% knows about the post stroke physiotherapy treatment and most of them 44 % agreed that they should follow physiotherapy daily and only 3% told that it should be done once a month (Table 4).

Regarding the knowledge of treatment for stroke only 26.8 % (n=72) had good knowledge while 39 % (n=105) had adequate and 34.2 % (n=92) had poor knowledge (table 3).

According to the present study, regarding the treatment of stroke only 26.8 % had good knowledge while many of them were (39%) having adequate knowledge. Nearly 85 % of the subjects told that they will take the victim immediately to the hospital. In two different Uganda studies and a Brazil study, similar responses were given [5], [17], [18]. At the same time, an Oman study says that indigenous treatment is the appropriate therapy for acute stroke [29].

Around 33% of the participants said that stroke can be fully treated. In the Sri Lankan study also revealed 91.3% believed early treatment would improve outcome [8]. At the same time majority of the population (82.5%) don't know regarding the thrombolytic therapy. A Brazilian study also found similar results while an Australian study and a Norwegian study also revealed the same outcome [5], [28], [30]. In the present study 72.1% of the population say that physiotherapy treatment can improve the post stroke outcome. This result is supported by the Australian study [28].

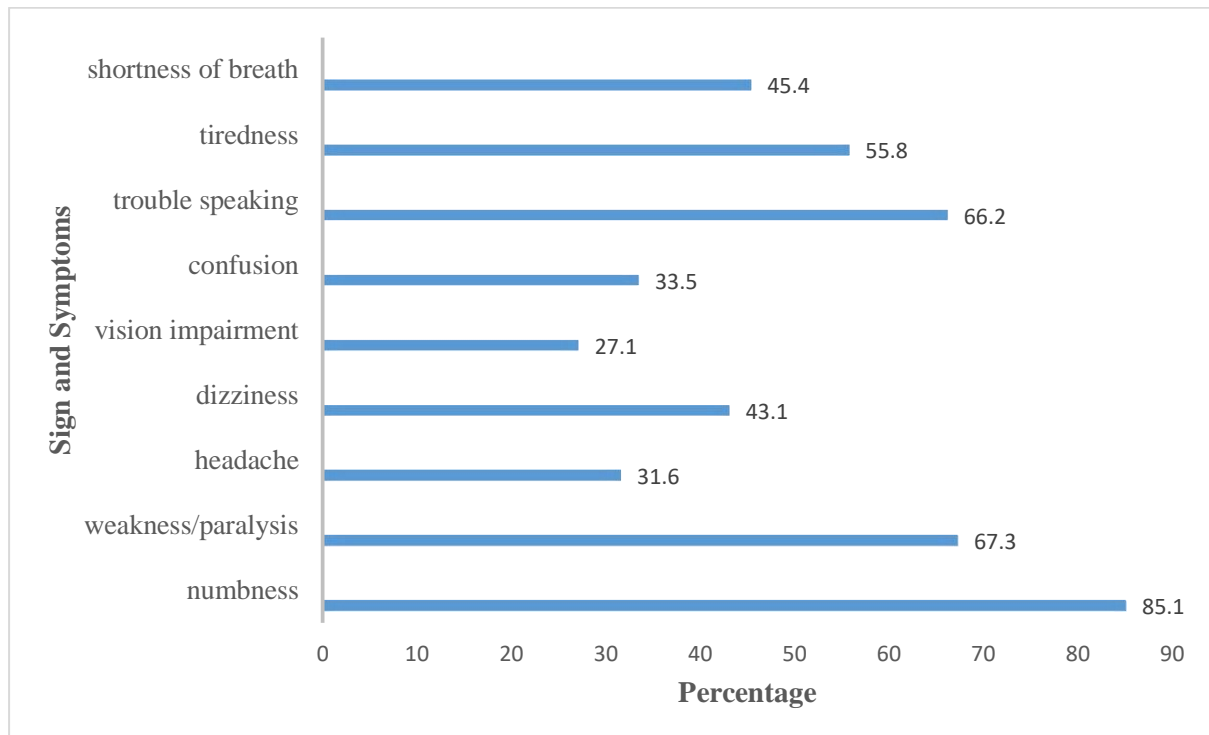


Figure 1: Knowledge on sign and symptoms of stroke

Table 4: Knowledge on treatment methods of stroke

Variable (n=269)	n	Percentage (%)
Stroke can be completely treated	89	33.1%
Take the victim to the hospital	227	84.4%
Take the victim immediately or within 03 hours of occurrence of stroke	80	29.7%
Stroke can be treated with an injection.	47	17.5%
Physiotherapy is important	194	72.1%
Daily physiotherapy treatment	117	43.5%
Once a week physiotherapy	69	25.7%
Once a month physiotherapy	8	3.0%

Table 5: Knowledge on prevention of complications of stroke

Variable*	n	Percentage
Early treatment for hypertension will be helpful	260	96.7%
Doing physiotherapy as soon as possible	181	67.3%
Swallowing exercises	46	17.1%
Early social interactions	157	58.4%

* Multiple responses were allowed.

The knowledge level among the patients regarding the complications of stroke was good in only 7.8 % (n=21) while adequate in 36.1 % (n=97) and poor in 56.1 % (n=151) (table 3). Considering knowledge on the prevention of complications of stroke, 97% of the patients said that early treatment for hypertension will be helpful while 67% said that doing physiotherapy as soon as possible will improve the condition after stroke, 17% said that swallowing exercises will improve the post stroke improvement (table 5). Regarding the prevention of complications only 14.1% (n=38) had good knowledge while 63.2 % (n=170) had adequate and 22.7% (n=61) had poor knowledge (table 3).

Regarding the measures to be taken to maintain hypertension to prevent stroke, 98.5% (n=265) percentage of the patients said that by taking anti-hypertensive tablets regularly they can maintain the blood pressure while 96.3% (n=259) said that by going to clinic regularly to doctor they can maintain, 86.6% (n=233) said that it is good to go to doctor for checkup daily, 79.2% (n=213) said that it is enough to do checkups once a month at clinic and 88.5% (n=238) tell that by checking blood pressure regularly they can maintain the blood pressure.

C. Factors Related to Poor Knowledge

In this study we could find significant association between knowledge of stroke and the following factors; place of living, education, occupation, income, history of hypertensive clinic follow-up and family history of stroke (Table 6). Education was found as having significant association with knowledge in studies conducted in Iran, Vienna and Nigeria [20], [26], [31]. Income was associated in a Californian study [32]. Duration of clinic follow up was found significant in Kancheepuram, India, a similar setting of this study [9]. Though we couldn't find any association with age and gender, the Iranian study says that there was association with age and gender with the knowledge [20].

Table 6: Association between the socio demographic factors and the overall knowledge of stroke

	Poor n (%)	Adequate n (%)	Good n (%)	P value
Sex				
Male	27(30.7)	54(61.3)	07(08.0)	0.139*
Female	76(42.0)	97(53.6)	08(04.4)	
Age				
20-30	06(42.9)	06(42.9)	02(14.2)	0.450#
31-40	05(33.3)	09(60.0)	01(06.7)	
41-50	12(41.1)	15(51.7)	02(06.9)	
51-60	40(47.1)	41(48.2)	04(04.7)	
61-70	40(31.7)	80(63.5)	06(04.8)	
Place of living				
Urban	32(33.3)	54(56.3)	10(10.4)	0.027*
Rural	71(41.0)	97(56.1)	05(02.9)	
Ethnicity				
Tamils	78(37.5)	119(57.2)	11(05.3)	0.737#
Sinhalese	1(100.0)	00(00.0)	00(00.0)	
Muslims	24(40.7)	31(52.5)	04(06.8)	
Burghers	00(0.0)	01(100)	00(0.00)	
Religion				
Hindus	52(35.1)	88(59.5)	08(05.4)	0.186#
Buddhists	04(100.0)	00(0.0)	00(00.0)	
Christianity	23(39.7)	32(55.1)	03(05.2)	
Islam	24(40.7)	31(52.5)	04(06.8)	
Marital status				
Married	85(38.5)	123(55.6)	13(05.9)	0.834#
Unmarried	05(27.7)	12(66.7)	01(05.6)	
Widowed	13(44.8)	15(51.8)	01(03.4)	
Divorced	00(0.0)	01(100)	00(0.00)	

Education				
No schooling	17(73.9)	05(21.7)	01(4.4)	
Primary	75(38.5)	110(56.4)	10(5.1)	
Gr 6 – gr.11	06(40.0)	09(60.0)	00(0.00)	0.000#
G/C/E A/L	04(16.7)	19(79.1)	01(4.2)	
Diploma/graduate/post graduate	01(08.3)	08(66.7)	03(25.0)	
Occupation				
Government	00(0.0)	01(50.0)	01(50)	
Non-government	04(36.4)	07(63.6)	00(0.0)	
Self-employment	23(40.4)	32(56.1)	02(3.5)	0.025#
Un employment	70(43.4)	83(51.6)	08(5.0)	
Retired	06(15.8)	28(73.7)	04(10.5)	
Income				
<10000	78(42.2)	101(54.6)	06(3.2)	
10000-20000	13(28.9)	28(62.2)	04(8.9)	
20000-30000	04(17.4)	16(69.6)	03(13.0)	0.029#
30000-40000	03(33.4)	04(44.4)	02(22.2)	
>40000	05(71.4)	02(28.6)	0(0.00)	
Duration of hypertension				
<01 year	29(49.2)	27(45.7)	03(5.1)	
01 – 05 year	38(37.3)	58(56.8)	06(5.9)	0.380*
>05 year	36(33.3)	66(61.1)	06(5.6)	
Duration of hypertensive clinic follow-up				
<01 year	37(49.3)	35(46.7)	03(4.0)	
01 to 03 year	23(36.5)	33(52.4)	07(11.1)	0.032*
>03 year	43(32.8)	83(63.4)	05(3.8)	
Family history of stroke				
Yes	12(21.4)	41(73.2)	03(5.4)	0.011*
No	91(42.7)	110(51.6)	12(5.7)	

*Pearson's chi-square p value

#likelihood ratio

IV. CONCLUSION

Stroke has serious outcome and its consequences in hypertensive patients are significant. According to this study, knowledge level on individual categories and overall knowledge were assessed. Majority of them had poor knowledge on all aspects specially in risk factors, sign and symptoms and minimizing complications. Knowledge level appears to be influenced by education level, income, occupation, duration of hypertensive clinic follow-up and family history of stroke according to this study. Major source of information providers were the community members and nearly half of the patients denoted TV/radio. But the role of health care workers seems to be inadequate. In future, health care workers should be motivated to increase the stroke awareness in public to prevent further disasters.

This review highlights the importance of increasing awareness among hypertensive patients about stroke symptoms, risk factors and the emergency response that is required. Public awareness and education campaigns should be targeted towards those at risk of stroke especially considering the hypertensive patients.

The small sample size limit the ability of this study to generalize findings to all patients of general population. This study was done in the medical clinics of a teaching hospital and the results may not represent hypertensive patients in other settings. Interviewer administered questionnaire may cause reactivity bias. Patients' answers may not be 100% reliable.

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