Frequency of Different Types of Stroke In View of CT Findings of The Stroke Patients Presenting to Radiology Department of Services Hospital Lahore

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ABSTRACT

Aim: To determine the frequency of different types of stroke in view of CT findings of the stroke patients

Study design: Cross sectional survey.

Duration: The study was conducted from 1st November 2010 to 30th April 2011.

Settings: New Radiology Department, Services Institute of Medical Sciences, Lahore

Methods: A total of 325 consecutive patients presented with clinical diagnosis of stroke were included. Non contrast CT head was carried out on a 16-slice MDCT Scan `Aquilion` from Toshiba. CT head was then evaluated by a consultant radiologist for different types of stroke like thrombotic and lacunar infarcts, intracerebral haemorrhage, sub-arachanoid haemorrhage and others (intra ventricular haemorrhage and venous strokes).

Conclusion: All patients with clinical suspicion of stroke should undergo CT head as first line radiologic investigation for its early diagnosis, better treatment options and to reduce its associated complications. As CT is readily available and important imaging modality for determination of different types of stroke as well as differentiation of ischaemic from haemorrhagic stroke, management of either condition can be planned appropriately. Majority of patients in the current study had thrombotic and lacunar infarcts, followed by intracerebral haemorrhage and subrachnoid haemorrhage.

Keywords: Stroke, CT imaging, thrombotic infarct, lacunar infarct, intracerebral haemorrhage,

INTRODUCTION

Cerebro-vascular accident or stroke syndrome, is a nonspecific term encompassing a heterogenous group of pathophysiologic causes, including thrombosis, embolism and haemorrhage[1].

The various stroke subtypes have demonstrated significant variability between different geographical regions as well as different ethnic groups within the same geographic region. These differences in stroke subtypes have significant impact on strategies of stroke prevention, diagnosis and treatment[2].

In majority of the cases stroke is due to cerebral infarction (62%)[3], approximately 30% of cerebral infarction results from thrombosis and 15-20% from lacunar strokes[4]. Intracerebral haemorrhage accounts for 30% and subarachnoid haemorrhage for 8%[3].

Stroke affects not only its victims but their care takers and society as a whole as well. It can cause life long disability and a very wide and frequent array of behavioral prolis.[5] Stroke is uncommon below 10 years of age and its incidence increases with age. Though the incidence of stroke in young is comparatively less but the mortality is high.

A study at Allied Hospital Faisalabad during 2003 revealed, intracerebral bleed had got higher trend in Asia than in Western countries and was more common in female gender. Cerebral infarction was more common in males and its frequency although the highest among the major categories of stroke in Asia but relatively less as compared to that in Western countries[3].

The study on Ischemic stroke subtypes in Pakistan at Aga Khan University Stroke Data Bank during 2003 showed lacunar strokes to be the most common subtype of stroke in our patient population[6].

The majority of acutely hypoperfused regions appear normal on non contrast CT[7]. CT scanning is still the preferred method of imaging hyperacute stroke. It is widely available, can be performed on patients who have a pace maker or are on a ventilator and can be performed quickly on confused, delirious patients. In addition interpretation in hyperacute stroke setting is fairly straight forward without the need for special training[8].

Early CT changes in ischemic stroke are: loss of insular ribbon, loss of Gray-white differentiation, loss of sulci (sulcal effacement), acute hypodensity, mass effect, the hyperdense artey sign.

Acute haemorrhage will usually appear on CT as Hyperdense to gray matter and has a heterogenous appearance.

The reason for conducting the study was to determine the frequency of stroke types in our population as only handful of studies have been conducted to date on this subject in our country. The improvement of neuroimaging in the form of fast scanners both CT and MR (in our case CT) was to help to delineate the type and extent of stroke. As in our study, the commonest type is thrombotic infarct we can make awareness in our population about its risk factors thereby making better and fast treatment possible and opening pathways for aggressive and more targeted treatment like I/V and intra arterial thrombolytics as in the developed countries.

PATIENTS AND METHODS

A total of 325 patients with all stroke (Diagnosed on the basis of hemiplegia / monoplegia, assessed by clinicians referred to our department for CT scan) of all ages and both genders presenting to new Radiology Department, Services Hospital Lahore were enrolled in the study while cases of neurologic deficit other than stroke. (Epilepsy on EEG, migraine by history, space occupying lesion on CT scan etc.) and unwilling to participate in the study were excluded from the study.

Informed consent was taken from each patient. All the formalities regarding CT head were taken according to Hospital policy. All the patients were recorded for their demographic features, i.e., age, sex, address etc. Non contrast CT head on a 16-slice MDCT Scan `Aquilion` from Toshiba was carried out.

CT head was then evaluated by a consultant radiologist for different types of stroke like thrombotic and lacunar infarcts, intracerebral haemorrhage, sub-arachanoid haemorrhage and others (intra ventricular haemorrhage and venous infarcts). All this information was collected through a specially designed proforma.

The data collected through the specified proforma was entered into SPSS (Statistical Package for Social Sciences) Version 12.0. After entering the data, it was analyzed descriptively and analytically. In descriptive section means and standard deviation was calculated for Quantitative Variables like age. Frequency and percentages were computed for categorical variable like Sex and stroke types (Thrombotic and lacunar infarcts, intracerebral haemorrhage, sub-arachnoids haemorrhage and others.)

RESULTS

The mean age of the patients was 59.2±14.2 years. There were 93(28.62%) patients in the age range of 20-50 years, and 232(71.38%) were between 51-90

years (Table 1). In the distribution of patients by sex, there were 172(52.9%) male and 153(47.1%) female patients (Table 2). In the distribution of patients by number of insults, there were 259(79.7%) patients with single insult and 66(20.3%) patients with multiple insults (Table 3). In the distribution of patients by infarctive stroke, 177(54.5%) patients had thrombotic infarct and 104(32%) patients had lacunar infarct (Table 4). In the distribution of patients by haemorrhagic stroke, there were 66(20.3%) patients having intracerebral haemorrhage and 8(2.5%) patients had subarachnoid haemorrhage (Table 5). In the distribution of patients by other stroke, there were 36(11.1%) patients having intraventricular haemorrhage (Table 6).

Table 1: Age Distribution (n=325)

Age (Years)	n	%age
20-50	93	28.62
51-90	232	71.38
Mean±SD	59.2±14.2	

Table 2: Gender Distribution (n=325)

Gender	n	%age
Male	172	52.9
Female	153	47.1

Table 3: Distribution of Patients by Number of Insults (n=325)

No. of insults	n	%age
Single	259	79.7
Multiple	66	20.3

Table 4: Distribution of patients by infarctive stroke (n=325)

Infarctive	Yes	No
Thrombotic	177(54.5%)	148(45.5%)
Lacunar	104(32%)	221(68%)

Table 5: Distribution of patients by aemorrhagic stroke (n=325)

Haemorrhagic	Yes	No
ICH	66(20.3%)	259(79.7%)
SAH	8(2.5%)	317(97.5%)

Table 6: Distribution of Patients by Other Stroke (n=325)

Other stroke	Yes	No
IVH	36(11.1%)	289(88.9%)

DISCUSSION

The prevalence of stroke is 6.4% in Pakistan according to the largest trial conducted recently. Stroke has been defined by WHO as "an acute neurological deficit with focal and at times global neurological dysfunction, lasting for more than 24 hours or, resulting in death before 24 hours and in which, after adequate investigations, clinical signs

are presumed to be of a non-traumatic vascular origin[9].

Stroke is the third most common cause of death in developed countries. The age-adjusted annual death rate from stroke is 116 per 100,000 population in the U.S.A and some 200 per 100,000 in the UK[10].

The incidence of stroke is decreasing due to better management of risk factors, but since stroke rate increases greatly with age and the number of elderly people is increasing, the burden of stroke on individuals, families and on the health services is unlikely to fall rapidly[11,12,13].

Stroke affects not only its victims but their care takers and society as a whole as well. It can cause life long disability and a very wide and frequent array of behavioral prolis[5].

In our study the mean age of the patients was 59.2±14.2 years. As compared with the study of Marwat et al[14] the mean age of the patients was 59.9±11.9 years, which is comparable with our study. In another study conducted by Amanullah et al[15] the mean age of the patients was 60±18 years which is also comparable with our study.

In our study there were 52.9% male and 47.1% female patients. As compared with the study of Marwat et al[14] there were 62.4% male and 37.6% female patients, which is comparable with our study. In another study conducted by Amanullah et al[15] there were 70% male and 30% female patients, which is also comparable with our study.

In our study 54.5% patients had thrombotic infract. As compared with the study of Amanullah et al[15] that showed 70% patients having thrombotic infarct, which is also comparable with our study.

In our study 32.0% patients had lacunar infarct. As compared with the study of Khan et al[16] lacunar infarct was found in 28% patients which is comparable with our study.

In our study intracerebral haemorrhage was found in 20.3% patients. As compared with the study of Ezeala-Adikaibe et al[17] intracerebral haemorrhage was found in 22.6% patients, which is comparable with our study. In another study conducted by Khan et al[16] intracerebral haemorrhage was found in 18% patients, which is also comparable with our study.

In our study subarachnoid haemorrhage was found in 2.5% patients, As compared with the study of Ezeala-Adikaibe et al[17] subarachnoid haemorrhage was found in 16.1% patients. In another study conducted by Qureshi et al[3] the frequency of subarachnoid haemorrhage was found in 8% patients, which is comparable with our study.

Computed tomography imaging has important role for determination of different types as well as differentiation of ischemic from haemorrhagic stroke. In this study the majority of patients are involved in thrombotic & lacunar infarcts, followed by intracerebral haemorrhage and subrachnoid haemorrhage. As CT is readily available, so all patients with clinical suspicion of stroke should undergo CT head as first line radiologic investigation for its early diagnosis, better treatment options and to reduce its associated complications.

CONCLUSION

Computed tomography imaging has important role for determination of different types of stroke as well as differentiation of ischaemic from haemorrhagic stroke, as management plan of both of these is totally different.

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