ORIGINAL ARTICLE

CT Scan Verdicts: Hemorrhagic Vs Ischemic Strokes

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ABSTRACT

Aim: To find the relative higher percentage of hemorrhagic strokes in our set up than ischemic stroke.
Methodology: This study was a retrospective review of one year data from January to December 2018 conducted in all hospitalized patients of POF hospital Wah Cantt with computed tomography (CT) diagnosis of either hemorrhagic or ischemic stroke.
Results: Out of a total of two hundred and twenty nine patients included in the study,105(36 %)had intracranial bleed and 187(64%) had ischemic stroke.
Conclusions: Interestingly, the study outcome reveals a relatively higher prevalence of hemorrhagic stroke than the previously conducted epidemiologic studies. We believe that this was mainly attributed to widespread use of CT scanning facility. Furthermore, higher percentage of patients unaware of hypertension or uncontrolled hypertension due to poor compliance might be a reason for increased intracranial bleed. On the other hand, widespread of the anticoagulants and the antiplatelet drugs are contributing to increased hemorrhagic strokes.
Keywords: CT scan, hemorrhagic strokes, ischemic strokes,

INTRODUCTION

Worldwide 15 million people suffer a stroke annually. Of these, 5 million die and another 5 million are left permanently disabled, leaving myriad consequences like psychologic, social and economic affecting not only the individual or his/her family but also society as a whole placing huge burdens on family and community[1-2] According to the World Health Organization (WHO) a stroke occurs every 5 seconds.[2-4]Worldwidestroke is the second leading cause of death. Approximately 10% of all worldwide deaths in 2005 were caused by the stroke in year 2005[4].

Stroke is the first leading cause of disability and the third most common cause of death in developed and developing countries[5]. According to World Health Organization estimates, roughly 20% of stroke related deaths occurred in South Asia.[4]

Previous reports on epidemiologic investigations of stroke have revealed the percentage of ischemic and hemorrhagic stroke as73 to 86 % and 8 to 18%, respectively. However, rest was undetermined due to not performing computerized tomographic [CT] examining or autopsy.[6-8]

Although no good-sized community based epidemiologic figures on stroke are available from Pakistan, estimated annual incidence of stroke is 250/100,000, turning to 350,000 new cases every year.[9]

Despite the lack of good quality epidemiological data there are significant differences in terms of stroke epidemiology, risk factors and stroke subtypes/ patterns in Pakistan as highlighted by several case series in literature. Although Ischemic strokes are more common than hemorrhagic strokes, the relative proportion of intracerebral hemorrhage is higher compared to the Western population[10]. The relative higher percentage of hemorrhagic stroke than the previously cited figures might be due to lack of CT scanning facilities and their common use. Another reason for relative increase in number of hemorrhagic stroke might be due to widespread use of antiplatelet drugs and warfarin for medical conditions like atrial fibrillation and deep venous thrombosis. This study was done to find the relative higher percentage of hemorrhagic strokes in our set up than these previously quoted figures.

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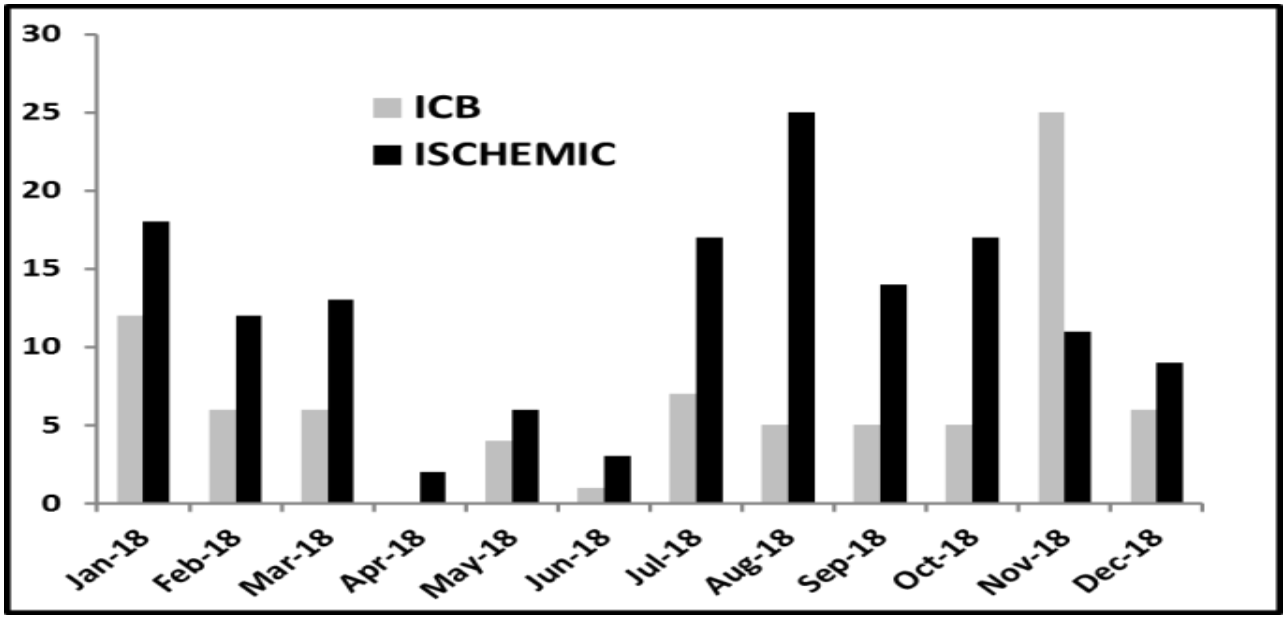
METHODOLOGY

This study was a retrospective review of one year data from Jan 2018 to December 2018 conducted in all hospitalized patients of POF hospital Wah Cantt with computed tomography (CT) diagnosis of either hemorrhagic or ischemic stroke. Intracerebral hemorrhage, intraventricular hemorrhage, and subarachnoid hemorrhage were included in the hemorrhagic stroke; hemorrhages due to trauma were excluded. Transient ischemic attacks excluded from Ischemic strokes. Patients in whom CT scan was not performed or unavailable were also excluded from the study. This study was conducted in Radiology Department, POF Hospital WAH with 850 inpatient beds serving as a regional tertiary care facility. The accident and emergency department annual registration is approximately patients.

RESULTS

Two hundred and twenty nine patients were hospitalized with a diagnosis of stoke for the 1-year study period;82 had hemorrhagic stroke and 147 had ischemic strokes on CT scan. Of the patients, 36% were ischemic and 64%werehemorrhagic; the standard error is 1.8%, and the margin of error at 95% confidence is 3.4%



DISCUSSION

The epidemiology of stroke in the developed world is well known.[11]It is enormously important to have data on incidence, prevalence and mortality of stroke so that programme for the prevention and control of this disease can incorporate the unusual disease pattern recognition and identify risk factors for the disease. It is unfortunate that limited information is available in developing countries where greater part of total population lives. The accuracy of the diagnosis and the representativeness of the population surveyed are of utmost importance in epidemiological investigations. Neurological expertise plays a great role in stroke diagnosis. However on the basis of clinical examination alone it is not always possible to differentiate a hemorrhagic from an ischemic stroke, so the brain imaging using CT or MRI is required.[12] As the CT scan is more readily available, so the CT scanning is typically performed acutely.

It is quite possible that earlier studies of stroke incidence were often performed on populations with the diagnosis made by clinical suspicion alone due to lack of access to brain imaging facilities. Brain imaging might not have been performed because the patient had mild stroke symptoms, died early ,patient refused scanning , patients were treated at the facilities that lacked scanning capabilities and were not medically stable for transfer.[12]Considering these limitations it is possible that the actual percentage of hemorrhagic stroke might have been underestimated.

Another important factor that might underestimate intracranial hemorrhages in stroke incidence studies is the delay in the CT scan time. Due to limited performance of early CT scanners, there is concept that most studied done with six to twelve hours of stroke is usually negative. As the small primary intracranial hemorrhages cause mild stroke symptoms and are apparent on CT by 14 days only[12]. Before the approval of thrombolytic therapy for the ischemic stroke, treatment of ischemic and hemorrhagic stroke was same, although access to CT scanning facility improved after 1990, scanning might have be delayed for that reasons.

Numerous studies documented that hypertension contributes to the majority of primary as well as recurrent intracerebral hemorrhages. Hypertensive small vessel disease results from tiny lipohyalinotic aneurysms that subsequently rupture and result in intraparenchymal hemorrhage. Typical locations include the basal ganglia, thalami, cerebellum, and pons. Relative more prevalence of spontaneous intracerebral hemorrhage is likely due to poor control of hypertension in developing countries than in developed world. There is huge burden of hypertension in the country as highlighted by the National Health Survey of Pakistan (1990-4).More than 70% of people with hypertension were unaware of their condition, and less than 3% had adequately controlled blood pressure[13].

As the risk factors (uncontrolled hypertension, anticoagulation therapy, chronic hepatic disease, previous cerebral hemorrhage) for the hemorrhagic stroke are increased, so these might have increased the percentage of this stroke type[14,15].

The thrombotic and embolic disease states like cerebral vascular disease, coronary artery disease, atrial fibrillation, pulmonary embolism, deep venous thrombosis and severely reduced left ventricular function are diagnosed more now a days and treated with antiplatelet and anticoagulant therapy. The risk of spontaneous intracranial hemorrhages increases with the use of oralanticoagulants. The rise in the use of these medications has also increased the occurrence of hemorrhagic stroke[16,17].

Confounding factor may in this data may be explained with the fact that patients with serious gravity of situation like those having more neurologic deficit are more supposed to visit hospitals, that is the trend in developing countries like ours. Usually patients who are having

intracranial bleeds were referred to this tertiary care hospital for neurosurgical intervention or intensive care unit services, this created a source of population bias.

*Because of our limited bed vacancies, In developing countries hospital admission rate of patients with stroke depends on how complicated the case is with stroke. Thus hospital data on stroke admission are usually biased towards the more serious or complicated cases .Possibly more hemorrhagic stroke patients were transferred to this tertiary care facility for intensive care unit or neurosurgical interventions, that might be a source of population bias

It is possible that some stroke cases were not registered because this data was compiled retrospectively. Another limitation of our study was differentiation between primary hemorrhagic strokes and initial ischemic strokes with hemorrhagic conversion. Early spontaneous hemorrhage re known to complicate large territory ischemic strokes.

Use of thrombolytic agent havealso certainly an increased risk of intracranial bleeding with administration for ischemic infarcts. There is no appropriate categorization of these infarcts.

A certain populations of hemorrhagic stroke patients are those who were initially diagnosed as ischemic stroke patients, completed their treatment and were then placed on antiplatelet agents (aspirin, dipyridamole, clopidogrel) or warfarin for future stroke prevention. These turned up with hemorrhagic conversion of the recent ischemic stroke

CONCLUSIONS

Relatively higher prevalence of hemorrhagic stroke as compared to the previous epidemiologic studies might be due to widespread use of CT scanning facility thus unmasking the actual percentage of hemorrhagic strokes. Higher percentage of patients unaware of hypertension and uncontrolled hypertension due to poor compliance is also a reason for higher percentage of intracranial bleed. Wide spread use of anticoagulation and antiplatelet therapy might be another reason for relative increase incidence of hemorrhagic stroke. We recommend that further validation studies should be done to support this finding.

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