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Medicine

ELECTROLYTE IMBALANCE IN ACUTE STROKE

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ABSTRACT Cerebro-vascular accident is the most common neurological disease affecting millions of people world wide. It is one of the leading cause of chronic disability and even death. The objectives of this study were to find out the incidence of electrolyte disturbances among acute ischemic stroke patients; and their association with severity of acute stroke. This study was a hospital-based cross-sectional study.

KEYWORDS : Electrolyte Imbalance, Hyponatremia, Hypokalemia, Cerebro-vascular Accident

INTRODUCTION
Stroke is considered a major health problem and the second leading cause of death world wide. It also is the leading cause of disability and affects the persons contribution to economy and a burden to the family[1]. Acute CVA patients die off because of either the primary disease itself or the resulting complications. Medical management focuses mainly on the prevention of sub-acute complications due to stroke, which includes aspiration pneumonia, malnourishment , dyselectrolytemia, Urinary tract Infection, bowel , Deep Vein Thrombosis, pulmonary embolism, contractures, joint abnormalities, and skin breakdown[2]. It is thus imperative to diagnose early and predict the outcome in the ER for assessing the prognosis of the patient.

AIM OF THE STUDY
The aim of the study is to find the most common electrolyte imbalance in patients admitted with stroke in the first 48 hrs of admission. This was a cross-sectional hospital-based study conducted in Sree Balaji Medical College & Hospital . Diagnosis of stroke was based on the history of disease, physical examination and was confirmed by neuro-imaging study. The electrolytes analyzed during this study were sodium and potassium. Sodium level in a range of 135-153 Meq/L was defined as normal. Potassium level in a range of 3.5-5 Meq/L was defined as normal. Other values were counted as dyselectrolytemia. Hyponatremia was defined when the level of sodium below 135 Meq/L. Hypernatremia was the level of sodium above 153 Meq/L. Hypokalemia was the level of potassium below 3.5 Meq/L, while Hyperkalemia was when the level of potassium above 5 Meq/L.

A total of 100 patients of stroke were selected, who satisfied the inclusion criteria through simple random selection.

The inclusion criteria included
1. Age above 20 years
2. First episode of acute stroke
3. Admitted within 48 hours of onset & fulfilling WHO definition of stroke 4.
4. Confirmation of stroke with neuro-imaging studies

The exclusion criteria included
1. Previous history of stroke, TIA, Syncope
2. Any other neurological deficit secondary to head injury.

RESULTS
This is a cross sectional study, done in the Department of General Medicine, in Sree Balaji Medical College & Hospital from February 2017 to July 2017. A total of 100 patients with stroke were selected, who were satisfying the inclusion criteria through simple random selection.

Out of the 100 patients, the majority 58 patients (58%) had ischaemic stroke, 42 (42%) had intracerebral haemorrhage. (Figure 1)
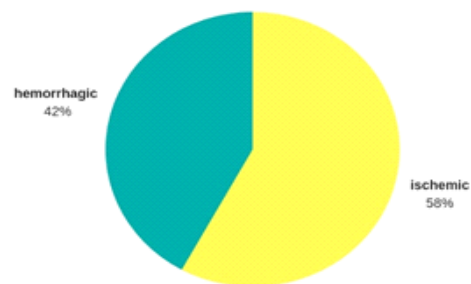
FIGURE 1

Based on electrolyte status totally, there were 50 (50%) patients with electrolyte disturbances. Out of these 50 patients, 17 patients (34%) had sodium disturbance, 33 patients (66%) with potassium disturbance and 2 patients (4%) with both sodium and potassium disturbances. Hyponatremia were found in 15 patients (%) and only 2 cases of hypernatremia.(Figure 2)
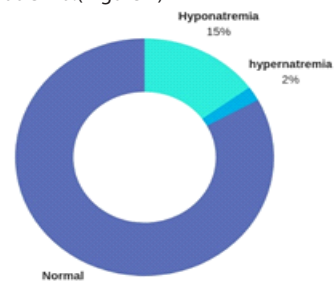
Figure 2

Hypokalemia was found in 28 patients and hyperkalemia was only detected in 2 patients. (Figure 3)
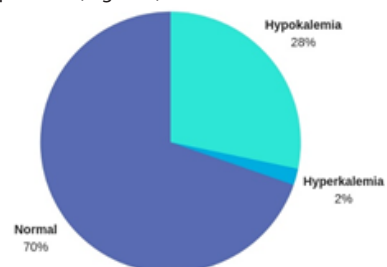
Figure 3

Here; comparing both ischemic and haemorrhagic stroke, hyponatremia and hypokalemia were the most common electrolyte imbalance in both aetiology but were predominantly seen in haemorrhagic stroke. Out of the 58 patients who had ischemic stroke, hyponatremia is seen in 5 patients (8.6%) had hyponatremia , 9 patients (15.5%) had hypokalemia and 1 patient (1.7%) had hyperkalemia. No patients had hypernatremia.

Out of the 42 haemorrhagic stroke patients, 10 patients (23.8%) had hyponatremia , 2 patients (4.7%) had hypernatremia, 19 patients (45.3%) had hypokalemia and 1 patient (2.3%) had hyperkalemia.

DISCUSSION

From this cross sectional study conducted at Sree Balaji Medical College & Hospital, we recorded that the incidence of electrolyte imbalance in this study was relatively high. The result from this study showed that admissions for ischemic stroke was significantly greater than haemorrhagic stroke(Figure 1). Higher rate for ischaemic stroke in this study does not represent the actual proportions in the general population or community as the sample size was only 100. Majority of the patients with stroke, especially of ischaemic stroke are not complicated and so are not referred to the higher centers for better management. Only limited number of patients admitted with sodium disturbances, and a comparatively larger group of patients with potassium disturbances. It was also noted that electrolyte imbalance was predominant in the haemorrhagic group when compared to the ischemic group. Hypokalemia was the most recorded electrolyte abnormality, followed by hyponatremia, hyperkalemia and no patient had hypernatremia (Figure2,3). Both hyponatremia and hypokalemia were predominant in the haemorrhagic group. Patients who had no electrolyte imbalance, had good outcome.

In this study, we can conclude that the incidence of electrolyte disorders in acute stroke patients was high but we there was no association between electrolyte disturbances and the severity of acute stroke. Both sodium and potassium disturbances were not significantly associated with the severity of acute stroke. Although hyponatremia/hypernatremia in acute stroke patients was associated with poor outcome of stroke, but it was not so in this study.

The limitations of this study were that;
1. The sample size was relatively small.
2. The definite causes of these dyselectrolytemia during acute stroke could not be carried out.

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