



TRENDS IN SERUM ELECTROLYTES IN PATIENTS OF DENGUE FEVER WITH AND WITHOUT WARNING SIGNS IN CHILDREN BETWEEN 1 AND 14 YEARS- A RETROSPECTIVE STUDY

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ABSTRACT

Objectives: To study electrolyte disturbances in Dengue fever and dengue fever with warning signs. **Design:** A Retrospective Study done March 2020 to May 2020 for a period of 3 months. **Materials and Methods:** All cases with Dengue fever and dengue fever with warning signs aged between 1 and 14 years were included. Dengue hemorrhagic fever, dengue shock syndrome cases, patients less than 1 year and more than 14 years were excluded. A total of 60 cases of patients of aged between 1 and 14 years were included in the study. Dengue fever was confirmed by NS1Ag, IgM and IgG antibody levels. Serum electrolytes were measured at the time of admission. There is insignificant association of grade of hyponatremia and the grade of hypokalemia with the degree of Dengue fever was observed. **Results:** Around 70% of the patients had normal serum sodium levels. Out of 60 patients 23.3% had mild hyponatremia, 5% had moderate hyponatremia and none of them had severe hyponatremia. **Conclusion:** Testing serum electrolytes early is very important in dengue patients during management so, if any abnormalities found, can be appropriately managed as some of these abnormalities may lead to increased severity as well as mortality.

KEYWORDS : Dengue, Serum Electrolytes, Hyponatremia, Hypokalemia

INTRODUCTION

Dengue fever is a mosquito borne disease of significant morbidity and mortality. It is transmitted by *Aedes aegypti* and *Aedes albopictus*. It has 4 genotypes DEN 1,2,3,4. The incidence of Dengue fever has raised exponentially in the past 5 decades and there are about 2.5 billion people living in dengue endemic areas worldwide [1]. Dengue has been endemic in 16 states in India and after 2010 has been present in all states. No specific treatment is available and mainstay of treatment is careful fluid management, specific organ support and correction of metabolic and electrolyte derangement. Hyponatremia and hypokalemia are the commonest electrolyte disturbances seen in Dengue fever.

Hyponatremia is frequent in dengue fever which can cause CNS dysfunction. The mechanisms proposed for hyponatremia are, as a consequence of salt depletion, excess water loss from increased metabolism, transient inappropriate antidiuretic hormone or the influx of sodium in the cells as a result of dysfunction of sodium potassium pump [2,3]. The viral infection itself causing plasma leakage or due to hypotonic therapy can be the other causes [4]. Dengue infection also leads to mild hypokalemia due to poor intake and increase in renal excretion due to Renin-Angiotensin-Aldosterone system secondary to volume depletion. Considering the occurrence of dyselectrolytemia in patients of Dengue fever it is necessary to have a greater degree suspicion in patients of dengue about electrolyte disturbances and treat them accordingly.

METHODS

The study was a retrospective observational study in the department of Paediatrics in a tertiary care hospital in Ballari from March 2020 to May 2020 for a period of 3month.

OBJECTIVES:

To study electrolyte disturbances in Dengue fever and dengue fever with warning signs.

Inclusion criteria:

All cases with Dengue fever and dengue fever with warning signs aged between 1 and 14 years were included.

Exclusion criteria:

Dengue hemorrhagic fever, dengue shock syndrome cases, patients less than 1 year and more than 14 years were excluded.

A total of 60 cases of patients of aged between 1 and 14 years were

included in the study. Dengue fever was confirmed by NS1Ag, IgM and IgG antibody levels. Serum electrolytes were measured at the time of admission. There is insignificant association of grade of hyponatremia and the grade of hypokalemia with the degree of Dengue fever was observed.

RESULTS

The mean sodium levels in Dengue fever & Dengue fever with warning signs was 130.03meq/l, the mean potassium level was 5.24 meq/l. Almost 70% had normal serum sodium levels. Out of 60 patients 23.3% had mild hyponatremia, 5% had moderate hyponatremia and none of them had severe hyponatremia (table 1). There was insignificant association of grade of hyponatremia and the grade of hypokalemia with the Dengue fever was observed.

Table 1: Grades of Hyponatremia

Grades of Hyponatremia	Number of patients	Percentage (%)
Mild	14	23.3
Moderate	3	5
Severe	0	0

Table 2: Grades of Hypokalemia

Grades of Hypokalemia	Number of patients	Percentage (%)
Mild	2	3.3
Moderate	0	0
Severe	0	0

DISCUSSION

Dengue increases the risk of electrolyte imbalances, including hyponatremia and hypokalemia [5]. Mild hyponatremia (sodium level <135 meq/l) was found to be present in significant number of patients with dengue fever. The mean value of sodium in the population mentioned was calculated to be 130.3 meq/l. In the previous study conducted by Shankar P et al, the mean value of sodium was 133.69 meq/l [6], whereas study done mean value of sodium was found to be 132 meq/l. It was 133 meq/l in the study done by Lumpnopong et al in Thailand in 2010 [7]. Mekmullica, J. et al. in his study reported that hyponatremia was 9.7 times more common in dengue patients [8]. Hypokalemia is expected in dengue fever secondary to decreased oral intake and potassium loss due to Renin-Angiotensin-Aldosterone system activation. In our current study mean potassium levels was found to be 3.62 meq/l. In the previous study conducted by Shankar P et al, the mean value of potassium was 3.58 meq/l [5]. Mild hypokalemia was observed in 3.3% of population under study (table 2). The prevalence of hyponatremia was 28.3% in all the patients of

dengue fever and dengue fever with warning signs. Mild hyponatremia was present in 23.3% making mild hyponatremia as significant electrolyte abnormality (table 1). Mean chloride levels was found to be 106 meq/l in the present study. Mild hyponatremia and mild hypokalemia are more common electrolyte disturbances observed in Dengue fever patients in our study.

CONCLUSION

Serum electrolytes testing early is very important in dengue patients during management so that if abnormalities are found, they can be appropriately managed as some of these abnormalities may lead to increased severity as well as mortality. Dengue increases the risk of electrolyte imbalances, including hyponatremia and hypokalemia. They may be associated with poor treatment outcomes. Routine screening of dengue patients for electrolytes may help the clinicians in risk stratification of patients

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