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ABSTRACT

Purpose: To study serum electrolyte derangements among children with acutediarrhea presenting with dehydration.

Methodology: Cross-sectional and descriptive study in department of Pediatrics, MMC Hospital, Mardan (Pakistan) for from 01-02-2020 to 31-10-2020. A total of 390 children having acute diarrhea with dehydration were included. Five milliliters (5mls) of blood was drawn and estimation of serum Sodium and potassium levels were done.

Findings: In 390 cases, 218 (55.9%) were males while 172 (44.1%) were females. The mean age was 2.5±1.5 years. Out of 390 cases, 2(0.51%) had no dehydration, some dehydration was noted in 218 (55.9%) cases while 170 (43.59%) cases had severe dehydration. Hypernatremia was noted in 218 (55.9%) cases and hypokalemia was noted in 77(19.74%) cases.

Conclusion: High rate of hyponatremia and hypokalemia was seen in our study in children with acute diarrhea and dehydration. Hyponatremia and hypokalemia was significantly associated with age, gender and grades of dehydration.

Keywords: *Rate, serum electrolyte, diarrhea, dehydration.*

INTRODUCTION

Every child develops at least 2-3 attacks of diarrhea[1-2]. Pediatrics mortalities due to diarrhea are about 1.77 million/ year in whole world. In this data, about 70% of these children belong to developing countries[3-4]. According to WHO, >700 million attacks of diarrhea in <5 years of age are reported in middle income countries.[5] Infectious microorganisms responsible may include E. coli, different viruses, protozoal species and helminthes which are transmitted through oral and fecal route[6]. Presence of different types of electrolyte disorders is associated with significant increase in mortality rates among children with diarrhea.[7] Electrolyte disorders may remain unrecognized and result in increased morbidity and mortality. Timely recognition, a high index of suspicion, and a thorough understanding of common electrolyte abnormalities is necessary to ensure their correction. Different studies have shown different incidences of electrolyte disorders among children with dehydration.[8] This study was undertaken to ascertain the frequency of different types of electrolyte disorders among children with diarrhea related severe dehydration, and to study the correlation of electrolyte, urea and creatinine levels with age of the patients. No study conducted previously had evaluated the correlation of electrolyte, urea, and creatinine levels with age of the patients.[9] According to research, none of these studies evaluated chloride levels in children of all age groups with dehydration.[10-12]Previous studies evaluated chloride levels only among children below one year and among children with malnutrition. [12-14-16]Parameters of this study included checking of chloride levels among pediatric patients with severe dehydration belonging to all nutritional statuses and age groups and we also studied correlation between levels of different electrolytes and renal function tests with age of the patients.

METHODOLOGY

This cross-sectional and descriptive study in pediatrics department, mmcHospital, Mardan with a duration of study was from 01-02-2020 to 31-10-2020. 390 patients with acute diarrhea. Sample size has been calculated by using following formula; $n=z^2pq/d^2$, where, p=39.3% (frequency of hypokalemia in acute diarrhea with dehydration), q =100-p, d=%. Non-probability consecutive sampling technique was used.

Inclusion Criteria: Mean wise

Genders with age ranging from 6 month to 12 years with **a**cute diarrhea/ dehydration of duration < 15 days. While patients with chronic and bloody diarrhea and acute renal failurewere excluded.

Data collection: Permission was taken from Institutional mmc hospital Ethical Committee for this study. Informed consent was taken from the parents. Five ml of blood was drawn for estimation of serum Sodium and potassium levels. All the data was analyzed using SPSS-2.2 Descriptive statistics was applied to calculate mean and SD for serum Na & Klevels. Frequencies and percentages were tabulated for the categoricalvariables like Gender, age groups, grades of dehydration, hyponatremia and hypokalemia. P value <0.05was considered as significant.

RESULTS

Table 1: Gender Distribution

Gender	n=	%age
Male	218	55.9
Female	172	44.1
Total	390	100

Table 2: Age distribution

Age groups	n=	%age
Up to 5 Years	276	70.77
>5 Years	114	29.23
Total	390	100

Table 3: Grades of dehydration

Grades	n=	%age
No Dehydration	02	0.51
Some Dehydration	218	55.9
Severe Dehydration	170	43.59
Total	390	100

Table 4: Hyponatremia in study cases

Hyponatremia	**n=**	**%age**
Yes	218	**55.9**
No	172	**44.1**
Total	**390**	**100**

Table 5: Hypokalemia in study cases

Hypokalemia	n=	%age
Yes	77	19.74
No	313	80.26
Total	390	100

DISCUSSION

In 390 cases, 218(72.7%) cases were males and 172(28.2%) cases were females. One of the study showed that there are 62.4% cases with male dominance[7]. This study is in accordance with the current study. In another study, it is reported that there are 60.3% male cases[8]. This is also in favor of this study. As per the Mardan Region, it had 62% male dominance[9].These results are in accordance with this study. In this study, mean age was 2.62±1.54 years. Our study showed that 218(92.6%) caseswere of age up to 5 years. A study conducted by Moyo and colleagues showed maximumcases upto 5 years[7]. These results are in favor of this results.

Regarding electrolytes disturbances, a study conducted in Nigeria has reported 58.5%hyponatremia and 32.1% hypokalemia in acute diarrhea having dehydration[10]. This study is in favor of our study.

CONCLUSION

Hypernatremia and hypokalemia was seen in KPK region during this study in children with acute diarrhea and dehydration. Hypernatremia and hypokalemia was significantly associated with age, gender and grades of dehydration.

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