



STUDY OF ELECTROLYTE IMBALANCE IN EMERGENCY PATIENTS

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ABSTRACT

Electrolyte imbalance is the most important parameter that maintains the normal hemostasis in the body. It also influence the normal functioning of the cells and maintenance of acid-base balance in the body. Electrolyte disturbances are commonly present in clinical disorders and so it has to be considered important parameter for correction in the management of the disease. The present study was conducted on the patients admitted in the emergency of government medical college Jammu in which the serum electrolytes to be measured. It was observed that the hyponatremia is most common electrolyte imbalance present in our study. Thus in the management of the patients admitted in emergency, electrolytes should be done as fluid therapy is the most common line of management in these patients while treating them the electrolyte abnormalities should be taken into consideration and should be treated accordingly.

KEYWORDS : Electrolytes, Electrolyte abnormalities, hyponatremia

INTRODUCTION

Electrolyte imbalance (EI) is common in hospitalized patients as well as in the general population and is associated with increased morbidity and mortality.¹ While estimating the electrolytes, the imbalances in every electrolyte must be considered for effective treatment of the patient. the most common electrolyte imbalance are sodium potassium and chloride and the kidneys which is responsible for maintaining the electrolyte balance in healthy individuals.² Besides the kidneys, the other mechanism which are involved in regulation of fluid and electrolyte balance are antidiuretic hormone, aldosterone and parathyroid hormone, and various other factors such as physiological stress and age also may play an important role. the presence of dysnatremia is in relation to the water balance. when proportionally more water than sodium is lost from the extracellular fluid compartment and serum sodium concentration is more than 145 mmol/L, it results in hypertonic dehydration that can be as a result of age-related thirst compartment. when serum sodium concentration is less than 135mmol/L and the proportion of sodium lost is greater than water, it results in hypotonic dehydration, due to overuse of diuretics. when there is proportionate loss of water and sodium, it results in isotonic dehydration and serum sodium concentration is normal.³ it has been reported in various studies that the electrolyte imbalances were often seen in elderly and critically ill patients, and occur in the development of disease such as acute or chronic renal failures, diabetes mellitus and myocardial infarction, etc. Whereas there are no well developed data on electrolyte disorders of the patients admitted in emergency, this study intends to provide more information about these abnormalities in order to reduce mortality rates in emergencies.

MATERIAL AND METHODS

The present study was conducted for a period of three months in the patients admitted in emergency ward of GMC Jammu in which serum sodium, potassium chloride were estimated of 4572 patients. the estimation of electrolytes-sodium, potassium, chloride was done on ion-selective electrode method.⁴ the normal accepted range for sodium is 135-145mEq/L, for potassium is 3.5-5.5 mEq/L, for chloride is 96-106mEq/L.

RESULTS AND DISCUSSION

The present study was carried out in 4572 patients. out of which 2974 (64.62%) were males and 1618 (35.38%) were females. the mean age of the patients was 45.26 years. Out of the total 4572 patients, 2839 (62.1%) patients presented with complaints related to surgical problems where as 1733

(37.39%) patients presented with medical issues. the various electrolyte abnormalities were observed in patients like hyponatremia was observed in 53.19% and hypernatremia in 10.69%, where as 36.11% patients presented with normal sodium levels. hypokalemia was observed in 47.15%, hyperkalemia in 14.72% and 38.12% presented with normal potassium levels. so it was observed in the present study that the most common electrolyte disorder was hyponatremia followed by hypokalemia and low levels of chloride. It had been observed that dysnatremia, predominantly hypernatremia, was also linked with higher mortality rate of up to 70% in severe cases⁵

Table 1: Percentage of electrolytes abnormalities in patients.

Parameters	L/R/N	Mean value	No. of patients	Percentage of patients(%)
Sodium(mEq/L)	low	125.47	2432	53.19
	Raised	148.23	489	10.69
	normal	139.45	1651	36.11
Potassium(mEq/L)	low	2.78	2156	47.15
	raised	5.82	673	14.72
	normal	4.36	1743	38.12
Chloride(mEq/L)	low	92.43	1839	40.22
	raised	108.39	947	20.71
	normal	101.74	1786	39.06

In patients with hypernatremia, seven fold rises in mortality was observed as compared with age-matched hospitalised patients. In a study conducted by Balci et al, they observed sodium imbalance in 65% of patients and hypokalemia in 15% and hyperkalemia in 8% patients. it is important to find out the physical aspects of hemodynamic changes of electrolyte levels in bloodstream, though the clinical signs and symptoms cannot be accredited to the imbalance of a single electrolyte. Balci et al also observed in their study that the patients who had hyperkalemia, the most frequent diagnosis were sepsis, infections, renal failure.⁶ the major proportion of dysnatremia in elderly persons can be due to the presence of concurrent disease such as hyperglycemia and the syndrome of inappropriate ADH secretion (SIADH).⁷ The other causes of dysnatremia such as use of diuretic or excessive use of intravenous fluids should also be considered. Increased intake of processed foods that have more salt content and excess iatrogenic salt intake also results in hypernatremia as older individuals require longer time to excrete salt loads due to reduction in eGFR with age.⁸ Presence of hypernatremia in seriously ill patients can lead to dehydration and damage to the central nervous system.⁹

CONCLUSION

Hence, we observed that the patients admitted in emergency frequently present with derangements in the fluid and electrolyte imbalance. There are also some limitations of the study like serum calcium and carbonate were not included .so a larger study including the more electrolytes should be included. because of the high rate of abnormalities ,the physicians must be well -versed with the dynamics of fluid-electrolyte balance . So, the timely identification ,a thorough knowledge and understanding of the general electrolyte disorders is necessary to ensure the appropriate treatment.

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