ORIGINAL RESEARCH PAPER

General Medicine

HYPOKALEMIC PERIODIC PARALYSIS: A HOSPITAL-BASED STUDY OF ITS ETIOLOGY AND CLINICAL PROFILE

KEY WORDS: Hypokalaemic periodic paralysis, Renal tubular acidosis type 2, Sjogrens disease

Dr. Harsh Patel* Junior Resident, General Medicine *Corresponding Author

Dr. Anisha Kukreja Junior Resident, General Medicine

Dr. Smita Patil Professor, General Medicine

Dr. N. D. Moulick Professor, General Medicine

INTRODUCTION

Hypokalemic paralysis is life threatening emergency which requires urgent treatment along with a rapid evaluation to determine the underlying cause. Current study aimed to observe the clinical presentation, ECG changes and response to treatment in patients with hypokalemic periodic paralysis.

The underlying etiologies of hypokalemia can be classified in two major categories: 1) acute conditions that cause the intracellular shifting of potassium without total body potassium depletion; and 2) total body potassium loss via excessive renal potassium excretion or extra-renal potassium loss due to vomiting or diarrhea. It is a known cause of hypokalemic paralysis due to the transcellular shift of potassium, whereas distal renal tubular acidosis (dRTA) is an important cause of hypokalemic paralysis due to excessive renal potassium loss. As the clinical presentation of hypokalemic paralysis secondary to dRTA can be similar to HPP, the evaluation of the acid-base status and the urine anion gap is pivotal in the differentiation of these two diseases. The failure to differentiate dRTA from hypokalemic periodic paralysis may result in improper management, which can lead to the development of potentially life-threatening conditions.

MATERIAL AND METHODS

Patients between age group of 18-65 years, presented to casualty with acute onset upper and/or lower limb weakness were screened, and those with hypokalaemia (S. K <3.5 mEq/L) were included in this study. All cases were subjected to detailed history, clinical examination and laboratory examination. E.C.G. and serum electrolytes were carried out on 1st day, 2nd day and 3rd day.

Observation

During the 6 months period from June 2022 to Dec 2022, a total of 1442 medical admissions from emergency room 127 patients of acute onset upper and/or lower limb weakness were screened. Out of which 5 patients were having hypokalaemia. All patients were in their 4th decade of life. Out of 5, 3 presented with quadriparesis while 2 with paraparesis. It was the second episode for 3 of them, while 2 were having it for the first time. After detailed history, examination, and laboratory testing 4 were found to be having dRTA while 1 was having drug overuse. All 4 dRTA patients were females. Out of 4 dRTA patients, one was already diagnosed with Sjogren's while 2 others were found to have Sjogren on further lab analysis. Serum potassium levels were ranging between 1.5-3.0 mEq/L. Disease severity was not in proportion with the serum potassium levels. ECG was suggestive of prominent U waves and flattening of T waves. All patients responded well to supportive therapy and IV potassium supplementation.

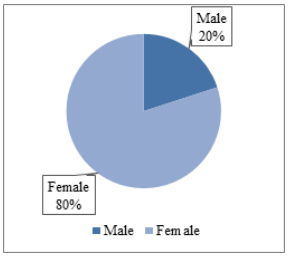
Clinical presentation	No of cases
Paraparesis	2 cases
Quadriparesis	2 cases
Quadriparesis with respiratory muscle weakness	1 case

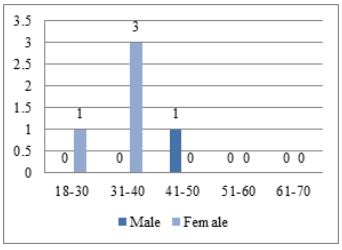
No of episodes	Cases
1st	1 case
2nd	2 case
3rd	1 case
More than 3	1 case

Age And GenderWise Distribution

Out of 5 subjects

- 80% (4) were Females
- 20% (1) were Male
- 20% (1) were in their third decade
- 60% (3) were in their fourth decade
- 20% (1) were in there fifth decade of life





Etiology & Rate Of Recurrence

- Out of 5 patients, dRTA was the underlying cause of hypokalaemia in 4 (80%) of the cases. 1 (20%) was having exercise induced.
- The patient with exercise induced hypokalaemia was having paralysis for the first time in life.
- Those with dRTA, one was having it for the first time, 2 were having it for the 2nd time while 1 was having it more than 3 times.

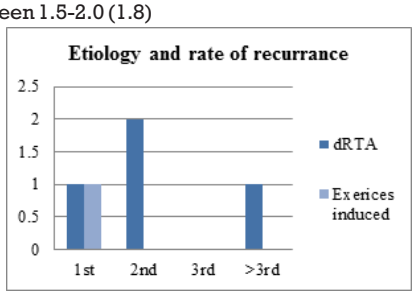
Underlying cause	Cases
dRTA	4
Exercise induced	1

No of episodes	Cases
1st	1
2nd	2
3rd	1
More than 3	1

Serum Potassium Levels & Severity Of The Disease

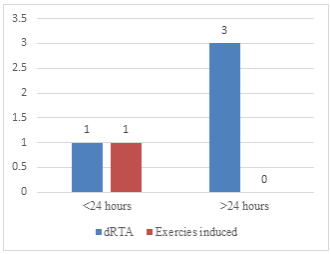
- 2 cases presented with paraparesis having Serum Potassium levels between 1.5-2.0 (1.5) and 2.1-2.5 (2.3)
- 2 cases presented with quadriparesis having Serum Potassium levels between 1.5-2.0 (1.8) and 2.6-3.0 (2.7)

- 1 case presented with quadriparesis with respiratory muscle involvement having Serum Potassium levels between 1.5-2.0 (1.8)



Recovery Time

- After initiation of potassium correction, the patient with exercise induced hypokalaemia got recovered within 24 hours.
- Those with dRTA induced hypokalaemia, 1 got recovered within 24 hours while 3 took more than 24 hours and serial potassium corrections to get recovered.



DISCUSSION

Out of 1442 medical admissions, 5 (0.34%) were having hypokalaemic periodic paralysis. Male: Female ratio observed here was 1:4. Majority (60%) of the cases were presented in the fourth decade of their life. Presenting clinical features were paraparesis (40%), quadriparesis (40%), and quadriparesis with respiratory muscle weakness (20%) 2 paraparesis patients are having serum potassium levels of 1.5 and 2.3 while other 3 quadriparesis patients were having serum potassium levels of 1.8, 1.8, 2.7. This indicates that severity of the disease has no direct correlation with the serum potassium levels. The most common cause, we found in our study, is dRTA. 4 (80%) were having dRTA while 1 (20%) were having exercise induced hypokalaemia as an underlying cause of weakness. It was the first episode of HPP with exercise induced hypokalaemia while the dRTA patients were having it first, second, and >3 times. This suggests dRTA patients are more prone to have multiple HPP attacks in their life time. Patient with exercise induced hypokalaemia got recovered within 24hr of starting the treatment with IV potassium chloride 40 mEq/l, while the patients with dRTA took more than 24 hrs and serial IV potassium correction plus other supportive treatments to get recovered. Flattening of T waves and bradycardia was the most common ECG finding in all 5 subjects. With the correction of serum potassium levels, T waves flattening got resolved simultaneously. While bradycardia was persistent even after 48 hrs of corrected serum potassium levels. In 3 subjects it took ECG 5 days to get normalise, while in other 2 subjects came with a normal ECG on their first follow-up after 7 days from discharge. Out of 4 dRTA cases, one was already a diagnosed case of Sjogren's syndrome. On further probing 2 out of the rest of the 3 was also found to have Sjogren's syndrome. A study done by N. Gururaj and M. Pavan Kumar at M.G.M. Warangal were revealed similar findings. Out of total medical admissions 0.4% were of Hypokalemia periodic paralysis with quadriplegia being the most common presentation, with Female preponderance. The most common cause of hypokalemia they found out was exercise induced.

CONCLUSION

Out of 1442 medical admissions, 5 (0.34%) were having hypokalaemia periodic paralysis with quadriparesis being the most common presenting symptom. All the cases of HPP are sporadic with female preponderance. M: F=1:4. Flattening of T wave with sinus bradycardia were found in all cases. All cases of hypokalaemia periodic paralysis were relatively less severe. No correlation was found between the serum potassium level and the severity of the paralysis. dRTA was found to be the most common (80%) underlying cause of hypokalaemia. All the cases improved with iv potassium therapy plus supportive treatment. Early recognition and prompt management of this condition can give gratifying results. Incidence of Sjogren's amongst the subjects were higher (0.2%) than the normal population (0.043%). However, these results can't be interpolated to the general population considering the small sample size of this study.