

A Study of the Characteristics of Hypokalemic Paralysis in Patient Hospitalized in Shahid Beheshti Hospital During 1990 –2000

**SA Masoud*

Dept. of Neurology, Kashan University of Medical sciences, Kashan, Iran.

Key Word :*Hypokalemic paralysis, potassium serum level*

ABSTRACT

Hypokalemic disease is a disorder in which the amount of serum's potassium declines and the patient faces limbs weakness. In this disease, eye muscle and respiratory muscles rarely become involved and death may follow due to respiratory paralysis and heart conducting disturbances. Since this disease is treatable and progressive weakness can be prevented, therefore in the study conducted we attempted to compare between the causes and epidemiological characteristics and start of clinical manifestation and the characteristics of this diseases with what had been presented in classical text and foreign sources in order to take effective measure for timely diagnosis. This was a descriptive prospective study. The records of hypokalemic paralyzed patients hospitalized in shahid Beheshti Hospital of Kashan during 1990 to 2000 were used to collect the data such as general condition of the patient, systematic and neurologic examination, serum potassium level, ABG, and paramedical measures like ECG were extracted and used for analysis. 27 patients were identified as Hypokalemic afflicted to paralysis and all were sporadic cases. The starting age for weakness attack was mostly in the second to fourth decade of life. The mean age for attack was 29 years . 96.3 percent were male and the rest were female. The level of potassium in serum of these patients during the weakness attack was mostly within 1 to 3.5 meq/L and the most changes in ECG was related to decrease in height at T and appearance of U- waves. 11 patients have more than 3 attacks (40.7 percent), 10 patients faced all-attacks (37.3 percent) and 6 patients experienced 2 times attack (22 percent). Considering that hypokalemic paralysis disorder is a treatable disease and immediate diagnosis and treatment reduces cardiac and muscular problems, it is necessary for the physician who treat patients referring with flaccid paralysis to keep in mind four limbs of this disease and use diagnostic measures.

* Corresponding author, Tel: +98-361-25599; Fax: + 98-361-551070; E-mail: s-a-masoud @yahoo.com

INTRODUCTION

Hypokalemic paralysis is a disease in which the level of serum potassium alternatively decrease and the patient faces muscular weakness in limbs and it rarely involves ocular, bulbar, or respiratory paralysis (1,2). Death may follow in case respiratory paralysis or disturbance in heart conduction occurs. The patients experience weakness in limbs many years after they are afflicted to this disease. Two-third of cases are due to the dominant autosomal and one-third occur in sporadic forms. In familiar forms, the ratio of men to women is 4 to 1 and the severity of the disease is more in men than women. This is also the case for the sporadic forms (1, 2, 5, 7, 14, 15, 23, 26). The weakness attacks typically occur within the first or second decade of life and after it starts around maturity and reveals itself in the third decade of life. In fourth and fifth decades, the frequency of attack decrease and even it may stop completely, but the attacks may start as early as 4 years or as late as 60 years old (3, 6, 8, 9, 10, 11, 12, 27). The duration of attack may continue from 3 to 4 hours to as long as one day. The attack usually occur following a period of rest and typically they occur in midnight or early morning. This mostly happens in patients with a history of consuming carbohydrate food or having strenuous activities the night before (12, 16-19). During an attack the level of serum potassium decrease and it may drop as low as 1.5 meq/L. In some occasions when the potassium level is not measured in the early stage of an attack, the potassium level may be reported normal. At time of dropping

* Corresponding author, Tel: +98-361-25599; Fax: + 98-361-551070; E-mail: s-a-masoud@yahoo.com

considered. The cause of the disease is the shift of potassium inside the cell due to the instability of muscle cell membrane. The treatment is done by using chloror-potassium tablet or inter venous potassium injection for correcting the blood potassium level (20-29). Since this disease is treatable and progressive muscular weakening or even death is preventable, therefore, in this research it has been attempted to compare the causes and epidemiological characteristics and the way of start of clinical manifestation and aggravating causes with what has been presented in classical text for the purpose of timely diagnosis and preventing complications associated with the disease.

MATERIALS AND METHODS

This was a descriptive retrospective research. The data were obtained from the records of hypokalemic patients hospitalized in Shahid Beheshti Hospital of Kashan from 1990 to 2000. The data included patient history, Systematic examination, complete neurologic examination, level of serum potassium, ABG, and paraclinical measures including ECG. Those records with incomplete recording of data were excluded before analyzing the data.

RESULTS

This study included 27 patients afflicted to hypokalemia during 10 years. All the cases were sporadic.

Table 1 presents the frequency distribution of afflicted patients to hypokalemia according to age and gender. 26 of the patients (96.3%) were male and only 1 patient (3.7%) was a female. The lowest age of affliction was 15 years and the highest age was 92 years. The most frequently age group of the patients in this study belonged to the age group between 15 to 34 years.

Table 2 presents the frequency distribution of hypokalemic patients according to the level of serum potassium and ECG changes. The level of serum potassium change in weakness attacks was around 1 to 3.5 meq/L and 9 patients (33.3%) had normal ECG and 16 patients had abnormal ECG (59.3%).

The frequency distribution of ECG changes of the hypokalemic patients hospitalized in Shahid Beheshti Hospital of Kashan is presented in Table 3. The most change regarding ECG occurred in the form of decrease in height of T-wave.

As it can be seen in Table 3 several changes occurred in the number of total exceeds 27. 11 of the study experienced more than 2 attacks patients suffered from one attack and 6 attacks.

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10 years record of hospitalization of hypokalemic patients was examined. All the patients in this study

Table 1. Frequency distribution of hypokalemic patients hospitalized in Shahid Beheshti Hospital of Kashan according to age and gender

Age	Gender		Total (%)
	Male (%)	Female (%)	
15-34	17 (63)	0	17 (63)
35-54	9 (33.3)	0	9 (33.3)
≥55	0	1 (3.7)	1 (3.7)
Total	26 (96.3)	1 (3.7)	27 (100)

ence text and other investigations 2/3 cases are reported as familial 1/3 and are sporadic (1-9). The reason for this discrepancy may be one of the three possible explanations:

1. Weakness hypokalemic attack occurs in other family members but it occurs so mildly that escapes attention and no follow up is performed, therefore it remains undiagnosed. Accordingly, the hypokalemic patient claims that no history of weakness attack in family is reported;

2. Familial hypokalemic attack is rare in Iran and the majority of the cases are sporadic forms;

3. Even though family hypokalemic paralysis is in the form of autosomal, but the penetrance of the disease in Iran may be lower than other nations.

In another study, from 18 patients afflicted to hypokalemic paralysis 50 percent were familial cases and 5/6 was sporadic (27). These findings are in agreement with the present research findings.

In regard to the age of starting weakness attacks, the majorities were in second, third, and fourth decade of life and the mean for age was 29 years, while in medical text the age of starting weakness attack are mentioned as the first and second decade of life and more after within the adolescent period (1,26). Another research conducted by Asadiakram (1999) including 50 cases of disease in the city of Tehran reported that the age of starting attack was more within the third decade of life and the average age was 27 years (4). The reason for this difference may be due to the ignorance of the patients regarding the weakness attacks in the past. These patients have probably referred for strong attacks or perhaps in Iran the age of strong attack is indeed in higher age.

In this research 96.3% of the patients were male and 3.7% were female. In Asadiakram research similar finding were reported (4). In medical text, the ratio of male to female is 20:1 and in another research this ratio was reported to be 70:1 which are in agreement with the finding of the present (17). In this research the level of serum potassium was between 1 to 3.5 meq/L (92.6%). This finding was in agreement with what were reported in other sources (5-19).

In this research the most frequent weakness attacks was twice (40.7%) and 37.3 percent of the patients experienced only one attack. In medical text also one attack is mentioned (1, 2, 5, 7, 14, 15, 23, 26, 27). The most frequent changes in weakness attack include decrease of height in T-wave and this was the case in this research.

Considering that hypokalemic paralysis is a treatable disease and limey diagnosis decreases the cardiac and muscular disease, it is necessary that during patients referral with flaccid paralysis specially for cases under 30 years of age physicians consider this disease as a serious matter and perform paraclinical examinations such as ECG and serum potassium to treat the patient.

Table 2. Frequency distribution of hypokalemic patients hospitalized in Shahid Beheshti Hospital of Kashan according to the level of serum potassium and ECG findings.

Level of Serum potassium	ECG		Total
	Normal	Abnormal	
1- 3.5	9 (33.3)	16 (59.3)	25 (92)
> 3.5	2 (7.4)	0 (0)	2 (7.4)
	11	16	27

Table 3. The frequency distribution of ECG changes of the Hypokalemic patients hospitalized in Shahid Beheshti Hospital of Kashan

ECG changes	Serum potassium level			Total
	1	2	> 3	
Normal	0	1	8	9
T-Wave Height decrease	6	9	0	15

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