

ESTIMATION OF SODIUM, POTASSIUM AND UREA IN PATIENS AFFLICTED BY EPILEPSY⁺

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Abstract

Epilepsy is one of the most common neurological disorders, it is a widespread problem in most of the medical clinics . This symptom has various causes .

Selected samples taken, but not randomly , from 74 patients who consisted of 39 males and 35 females . who used to attend private clinics in Kirkuk city, besides the samples of a group of 60 control individuals whose ages were ranging from several months to 30 years .The duration of the study lasted from the beginning of April 2001 till the end of December of the same year.

Blood sample were collected from each patient and control member and were centrifuged ; the serum samples were kept at(-20 °c) so as to measure the concentration of sodium, potassium and urea in them .

It was found that there was a decrease in sodium concentration but an increase in potassium was concentration in an epileptic, while the urea level was normal.

المستخلص

يعتبر مرض الصرع من أكثر الاضطرابات العصبية شيوعا. كما انه من المشاكل المنتشرة في أكثر العيادات الطبية ولهذا المرض أسباب عدة لقد اخترنا نماذج أخذناها ولكن ليس بصورة عشوائية من ٧٤ مريضا والذي كان ٣٩ منهم من الذكور بينما ٣٥ منهم من الإناث وهم من مراجعي العيادات الطبية الخاصة في مدينة كركوك .

أضف إلى (٦٠) فرد كونوا مجموعة السيطرة والذي كانت تتراوح أعمارهم بين عدة اشهر و(٣٠) سنة بدأت دراستنا هذه من شهر نيسان ٢٠٠١ حتى نهاية كانون الأول من نفس العام .

جمعنا نماذج الدم من كل مريض وكذلك من جماعة السيطرة ثم أجرينا عليها عملية الطرد المركزي في الوقت الذي حفظت الأمصال في درجة(-٢٠) مئوية وذلك لامكان قياس تركيز كل من الصوديوم والبوتاسيوم واليوريا.

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لقد اكتشفنا بان هناك نقصان في تركيز الصوديوم وبعبسه وجدنا زيادة في تركيز البوتاسيوم في المريض المصاب بالصرع بينما بقى مستوى تركيز اليوريا ثابتا .

Introduction

Epilepsy is a neurological disorder, different distribution of seizures type have been reported in population[1]. Epileptic seizures are more common in infancy and childhood than any other period of live [2]. A single epileptic attack may be called fit, fit epileptic seizures, and an epileptic convulsion [3]. The etiology of epileptic seizures is associated with electrolyte disturbance, drug withdrawal, acute brain disease, trauma, idiopathic and hyponatremia [4, 5]. In new born biochemical disturbance may induce seizures [6].

Epileptic foci are hyperemic during seizures as where flow is reduced in other parts of the brain [7].

The major classification of epilepsy is generalized, unilateral, partial or focal, unclassified, erratic seizures of newborn [8, 9]. Seizures takes many forms varying according to site in brain. The incidence of seizures between 0.5-1 percent [10]. The disease is common in children; gradually decrease between 5-20 years old and stint to increase gradually in elderly [11, 12].

Regarding the sex distribution, it has been reported that the incidence of epilepsy in males was higher than females [13, 14]. while the mental illness is more common in females than males [15, 16].

The neurotransmitter travels across the synaptic cleft and bind to receptor site on the postsynaptic membrane, where they alter permeability of that membrane to sodium and potassium ions and so produce 3 impulses that can travel along that neuron [17, 18].

Aim Of The Study

The present study was planned to determine the concentration of sodium, potassium and urea in epileptic patient who attended the private clinics in Kirkuk city.

Patients And Methods

A prospective (non randomized) study was carried out on 74 epileptic patient who diagnosed by neurosurgeon in private clinics in Kirkuk and 60 healthy individuals. The period of study was 9 months from beginning of April 2001 to end of December 2001 .

The concentration of sodium and potassium was estimated by flame photometer (LKB in Sweden), while the concentration of urea was determined by spectrophotometer (wave length 450nm). The biochemical analysis was performed in Biochemistry Department in Kirkuk general hospital.

Statistical analysis was employed by using T-test for comparisons between deferent groups.

Results

It is indicated in table (1), that in epileptic patient, the concentration of sodium was lower while the concentration of potassium was higher than normal control individuals. Statistically there was significant difference in the level of sodium and potassium between epileptic patient and controls ($P < 0.05$).

It is also revealed in table 1, that the concentration of serum urea did not vary significantly between epileptic patient and normal controls ($P > 0.05$).

Table (1): The concentration of sodium, potassium and urea in sera of epileptic patient and control.

Subject	K+ in Blood Serum mmol/L	Na in serum mmol/ L	Urea mmol/ L
Patient (74)	5.51 ± 0.64	128.05 ± 6.21	3.55 ± 0.88
Control (60)	4.35 ± 0.41	134.80 ± 4.38	3.68 ±
t – value	$P < 0.05$	$P < 0.05$	$P > 0.05$

Concerning the sex, it was found that there was no significant difference in the concentration of serum sodium, potassium and urea between males and females in epileptic patient and normal controls.

Table (2): The concentration of sodium, potassium and urea in male and female in epileptic patient and control.

Subject	Control		Patient		t.value
K in blood Serum mmol/L	Female	Male	Female	Male	$P > 0.05$
	4.37 ± 0.47 n=30	4.33 ± 0.36 n=30	5.54 ± 0.49 n=35	5.60 ± 0.44 n=39	
Na in blood Serum mmol/L	143.7 ± 4.34 n=30	143.9 ± 4.48 n=30	128.31 ± 5.77 n=35	127.61 ± 6.69 n=39	$P > 0.05$
Urea in blood Serum mmol/L	3.82 ± 1.94 n=30	3.69 ± 1.08 n=30	3.37 ± 1.01 n=35	3.40 ± 0.79 n=39	$P > 0.05$

N=number of samples

Discussion

The result of the study showed that the (K) concentration was above the normal value 3.2mg/l [18], (hyperkalemia) while the Na concentration was below the normal value 155mg/l [18], (hyponatremia) this finding is in agreement with that reported by [11,12], while [19], observed the presence of some mechanisms which determine or accompany cellular brain edema, intracellular and extra cellular osmolality, alteration neuronal excitation, increased extra cellular K concentration, anoxia, ischemia and hepatic encephalopathy. While [1], found all epileptic patients have normal value of Na, K concentration, [21] observed spontaneous interictal bursting occurred in both Na and K levels. [10] observed biochemical disturbance such as hyponatremia in new born may induce seizures.

[5] observed the hyponatremia is the most common electrolyte disorder in clinical medicine severe hyponatremia and, its rapid correction may be associated with severe neurologic complications.

In this study table (2) showed the urea concentration may be normal when we compared with the patient value. In contrast [1] found the normal urea value in patients with epileptics. While [20] observed in patients with secondary hypoparathyroidism caused by uremia have abnormal (EEG) characterized by increased frequency of slow wave activity, also found neurological symptoms when intravenously urea injected intravenously to animal.

Conclusion

From the result of this study it is concluded that there was variation of sodium and potassium levels in epileptic patient but there was no alteration in urea value.

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