The effect of the antidepressant drug imipramine on sodium blood level

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Abstract

The effect of Antidepressant drug Imipramine on Sodium blood level was studied on 100 depressed patients treated with Imipramine drug for a period of from 0.5 to 5 years in a dose ranged from 75 to 150mg daily. Case series study. Psychiatric department at Ibn Seana Teaching Hospital, Mosul City for period from 0.5-5 years. 100 depressed patients 35 males and 65 females varying in age between 22-65 years mean 42.05+14.24 attending psychiatric unit Ibn-Seana hospital for treatment of depression with 100 normal (control) subjects were studied. The diagnosis of depression was based on the categories present in DSM-IV and ICD-10. Clinical examination and laboratory investigations for renal function for both groups were done which revealed normal and they were free of any known organic disease. Samples of blood were taken from both groups for estimation of serum sodium level; they were free of any medication at the time of sampling. Clinical examination for all patients revealed no symptoms of water intoxication, measurement of sodium blood level reported a range from 135-155 mM/L. Six patients reported low sodium blood levels 130-132 mM/L .There were no significant differences in sodium blood level among cases of depression and the control group which means the Antidepressant drug Imipramine has no or very little effect on sodium blood level. This study revealed that the uses of Antidepressant drug Imipramine for the treatment of depression has no or very little effect on sodium blood level.

Keywords: Depression, Antidepressant drug (Imipramine), Blood Sodium level.

Introduction

Disturbances of salt and water balance may occur because of the adminstration of many drugs [1]. Hyponatraemia., a relative preponderance of water to salt due to true sodium depletion, primary water overload, cardiac failure or hypoproteinaemia, inappropriate secretion of vasopressin (ADH), and the sickle cell syndrome [2].

A number of drugs can cause water retention and hyponatraemia such as chlorpropamide [3], antineoplastic agents like vincristine [4] and cyctophophamide [5], acetaminophen [6], carbamazepine which is chemically related to tricyelic antidepressants and neuroleptics [7], amitriptyline [8] and monoanime oxidase inhibitors [9].

Many mechanisms are involved in the development of water retention and hypenatreamia due to the administration of these drugs, chlorpropamide augments the action of ADH in the Brattleboro rat [10] and in the toad bladder [11] and in patients with diabetes insipidus [12], in addition, chlorpropamide may stimulate ADH release since it overcomes the inhibition of ADH release. That normally occurs with water loading [13].

Robertson et al [14] have reported elevated plasma ADH concentrations in patients treated with vincristine [14]. Clotibrate act by release of endogenous ADH since the drug increases the amount of ADH in the urine of water loaded man [15]. Carbamazepine may increase ADH release from the pituitary as well as elevation the responsiveness of the kidney to ADH [16]. The aim of the present study is to investigate the effect of the antidepressant agent, Imipramine, on sodium blood level in a number of depressed patients.

Patients and Methods

The present study include 100 depressed patients attending psychiatric unite Mosul Ibn-Seana Hospital for the treatment of depression. The patients consisting both males and females 35 males and 65 were females varying in age between 22 - 65 years mean 42.05±14.24 years.

They manifested depressed mood, lack interest with the surrounding, disturbed sleep loss appetite and weight delusion of guilt feeling and self blame, some of them 11 patients 4 men and 7 women manifested suicidal ideas. The clinical diagnosis of depression was based on the categories present in the DSM-IV and ICD-10 for the diagnosis of affective disorders clinical examination and laboratory examination for the renal function was done for each patient which revealed normal, they were free of any known organic disease.

Blood samples were obtain from each patient for measuring blood sodium level which reported within normal range 135-155 mM/L they are free of any drug at the time of sampling .

All patients were treated with antidepressant drug Imipramine, the dose ranged 75-150 mg daily 97.20±91.22 with the duration of treatment ranged between 0.5-5 years. Three ml of blood was taken from each patient and serum sodium was measured using flame photometry method [17].

Second group of normal (control) subjects were included in the study, consisting 100 individuals 35 males and 65 non pregnant females varying age between 22 to 65 years mean 39.35 ± 16.07 years.

They are selected free of renal and other organic disease, clinical and laboratory examination was done for renal function for each subject which revealed normal, serum sodium level within normal range 135-155 mM/L.

Results

Clinical examination for all patients revealed no symptoms of water intoxication, measurement of sodium blood level reported a range from 135-155 Mm/L.

Six patients reported low sodium blood levels with the mean 130-132 mM/L .

There were no significant differences in sodium blood level among cases of depression and the control group which mean that the antidepressant drug Imipramine has no or very little effect on sodium blood level.

Discussion

In the present study Imipramine an antidepressant drug have been shown to lower sodium blood level in six patients. The six patients were asymptomatic, they complain no symptoms characteristic of water accumulation, like lethargy, weakness, mental confusion, muscle cramps or headache which indicate that water retaining properties of imipramine is mild, several pharmacological agents have been shown to have water retaining properties. At first the antidiuretic actions of imipramine were used to advantage in the treatment of patients with diabetes insipidas. However more recently there have, been numerous reports of serious water retention and dilutional hyponatraemia as a consequence of water retaining drugs.

Medications containing the tricyclic structure including antidepressants, phenothaizines and carbamazepine have been associated with hyponatremia. The syndrome of inappropriate antiduretic hormone secretion with hyponatraemia has been reported in patients receiving amitriptyline [18], imipramine [19], carbamazepine [20] and the neuroleptic drug thiordazine [21]. The mechanism by which tricyclic compounds cause hyponatraemia is unknown but some reports showed that this action was due to increase the secretion of ADH by the pituitary gland [22] or by increasing renal tubular sensitivity to normal plasma concentration of ADH [23].

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