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Original Research Article.

To Study the Levels of Sodium and Potassium in Newly Diagnosed Essential Hypertensive Patients at a Tertiary Care Centre

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ABSTRACT

Background: Hypertension is one of the world's leading causes of death and disability among adults. It is the major risk factor responsible for coronary, cerebral and peripheral vascular disease. The present study was conducted to study the levels of sodium and potassium in newly diagnosed essential hypertensive patients.

Materials and Methods: The study was carried out to study the levels of sodium and potassium in newly diagnosed essential hypertensive patients. 150 patients (75 cases and 75 controls). All the patients were subjected to detailed history taking, careful physical examination and biochemical analysis to exclude secondary hypertension. Serum sodium and potassium was estimated. The recorded data was compiled, and data analysis was done using SPSS Version 20.0 (SPSS Inc., Chicago, Illinois, USA).

Results: In the present study 150 patients were included in which 75 were cases and 75 were controls. The result showed that the serum sodium level was significantly more among hypertensive (144.23±4.23) population studied. Serum potassium level was significantly less among hypertensive (4.45±0.67) population studied.

Conclusion: The present study concluded that the serum sodium level was significantly more among hypertensive population and Serum potassium level was significantly less among hypertensive population.

Keywords: Serum Sodium Level, Hypertensive, Serum Potassium Level.

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INTRODUCTION

Hypertension is called the "silent killer" because, very often, it doesn't come with warning signs or symptoms. It is a chronic condition of concern due to its role in causation of coronary heart disease (account for 20- 50% of all death), stroke and other vascular complication. Essential hypertension comprise more than 90% of hypertension. Globally, the overall prevalence of hypertension in adult aged 25 years and above was around 40% in 2008.[1]

Hypertension affects approximately 25% of the adult population worldwide, and its prevalence is predicted to increase by 60% by 2025, when a total of 1.56 billion people may be affected. It is the major risk factor for cardiovascular disease and is responsible for most deaths worldwide. Primary hypertension, also known as essential or idiopathic hypertension, accounts for as many as 95% of all cases of hypertension. Primary hypertension results from the interplay of internal derangements (primarily in the kidney) and the external environment. Sodium, the main extracellular cation, has long been considered the crucial environmental factor.[2-5] However, dietary potassium and sodium do not necessarily reflect their levels in extracellular fluids. Serum potassium and sodium represent the internal environment of the body, and play an important role in the regulation of blood pressure.[6-7] The present study was conducted to study the levels of sodium and potassium in newly diagnosed essential hypertensive patients.

MATERIALS AND METHODS

The study was carried out in Department of General Medicine, B.V.V. Sangha's S Nijalingappa Medical College & H.S.K. Hospital & Research Centre, Bagalkot, Karnataka (India) to study the levels of sodium and potassium in newly diagnosed essential hypertensive patients. 150 patients (75 cases and 75 controls). Before the commencement of the study ethical approval was taken from the Ethical Committee of the institute and written consent was taken from the patient after explaining the study.

Patients with primary hypertension, Patients whose age was above 18 years and both sexes were included in the study. Patients below 18 years, Patients with renal failure, Pregnant women, Patients with secondary hypertension, Patients on non-steroidal antiinflammatory agents, antihypertensive, diuretics, beta blockers or stimulants, Patients with malignant hypertension were excluded from the study. All the patients were subjected to detailed history taking, careful physical examination and biochemical analysis to exclude secondary hypertension. Patients were informed to refrain from smoking or drinking tea or coffee for at least thirty minutes before measuring blood pressure.

Then blood pressure was measured using the following guidelines. Note the pressure, patient position, the arm, cuff size (e.g., 140/90, seated, right arm, large adult cuff). Serum sodium and potassium was estimated using Flame emission photometric method. The recorded data was compiled, and data analysis was done using SPSS Version 20.0 (SPSS Inc., Chicago, Illinois, USA).

Table 1: Serum Sodium levels in cases and controls.

Serum Sodium levels	Mean±SD	p-value
Cases	144.23±4.23	<0.05
Control	140.11±5.45	

Table 2: Serum potassium level in cases and controls.

Serum Potassium levels	Mean±SD	p-value
Cases	4.45±0.67	<0.05
Control	4.98±0.14	

RESULTS

In the present study 150 patients were included in which 75 were cases and 75 were controls. The result showed that the serum sodium level was significantly more among hypertensive (144.23±4.23) population studied. Serum potassium level was significantly less among hypertensive (4.45±0.67) population studied.

DISCUSSION

Hypertension is one of the leading causes of death and disability among adults all over the world. Hypertension the most common form of cardiovascular disease is present in nearly 25% of adults and increases in prevalence with age. It remains the major risk factor for coronary, cerebral and peripheral vascular disease.[8]

The rarity of hypertension among those consuming large amount of salt may probably be related to chronic adaptation of body system towards renal clearance of sodium. So in addition to the hereditary predisposition and high sodium intake and lower potassium intake, the renal handling of these cations also play an important role in pathogenesis of essential hypertension.[9]

Priyanka. D et al did a study to study the serum levels of sodium and potassium and correlate them with blood pressure and found that Serum sodium was significantly more among hypertensive group and correlated positively with blood pressure unlike serum potassium which was lower and correlated negatively with blood pressure.[10]

Aravind C et al found that Mean serum sodium level was elevated significantly among hypertensives where as serum potassium level was significantly lower among them when compared to healthy controls. The blood pressure also correlated positively with serum sodium; body mass index and waist circumference whereas negatively correlated with serum potassium. Body mass index was significantly more in those with stage II hypertension.[11]

Jan, et al. found that Serum sodium in the hypertensive group was 140 ± 2.90 while in the control group it was found to be 138.5 ± 1.12. Serum sodium was higher in the hypertensive group than the control group and considered to be a factor responsible for the causation or perpetuation of blood pressure.[12]

In another study conducted by Williams et al, found that a positive correlation exists between serum sodium and blood pressure in this study group.[13]

Kumar A et al showed that Serum sodium was higher and serum potassium was lower in cases than control group. The mean systolic and diastolic blood pressure for hypertensive patients was 160.80+- 10.88 and 100.68+- 6.72 respectively. Serum sodium was significantly more among hypertensives and it was independent of associated risk factor. Serum potassium was significantly in the range of lower limit of normal value and somehow it correlated negatively with blood pressure.[14]

CONCLUSION

The present study concluded that the serum sodium level was significantly more among hypertensive population and Serum potassium level was significantly less among hypertensive population.

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