

Ferritin level and blood parameters in patients with hypertension and diabetes

Abrar S. Abdul-Razak¹, Alsharba, Najlaa Saeed², Nadheerah Falih Neamah³, Qutaiba A. Qasim⁴

^{1,3}Department of Pharmacology and Toxicology, College of Pharmacy, University of Basrah, Basrah, Iraq.

²Department of Clinical Laboratory Science, College of Pharmacy, University of Basrah, Basrah, Iraq.

⁴College of pharmacy, Al-Ayen University, Dhi Qar, Iraq.

Email: Abrar.Salman@uobasrah.edu.iq

DOI: 10.47750/pnr.2022.13.S01.69

Abstract

Diabetes and hypertension are two of the most prevalent chronic diseases in the world. In this investigation, ferritin, Na, and K levels in serum as well as certain tests for liver and kidney function were estimated and compared between hypertensive, diabetic, and healthy persons.

The current study was an analytical and observational study conducted at a hospital. Total 60 patients and 30 healthy volunteers were included, three groups comprised, each group involved 30 diagnosed hypertension patients, diabetes mellitus patients and healthy volunteers (with normal values). The results showed significant differences among control and patient groups in potassium and ferritin and urea level. While, nonsignificant change in test liver enzymes, neither with normal nor with patient groups were observed.

Keywords: Diabetes, hypertension, chronic diseases.

INTRODUCTION

Essential micronutrients which vital for the body's normal functioning includes minerals and trace elements. Particularly appropriate for physiological processes are these elements. Several biochemical processes require the presence of minerals and trace elements, which also serve as cofactors for numerous enzymes and as stabilizing elements in proteins. Definite trace elements control important biological processes by attaching to the receptor at cell membrane or by altering receptor's structure to block the entry of specific molecules. Micronutrients perform a dual function: they keep cellular structures stable at ideal levels, but when levels are low, alternate pathways are opened up and illnesses may result. These crucial micronutrients reveal clear connections with diabetes mellitus and have significant physiological effects. (Dubey, P., V. 2020).

The physiological homeostasis of the organism is significantly influenced by iron. Serum ferritin is used as a sensitive indicator of the body's iron status and a well-known diagnostic biomarker for iron deficiency. Additionally, high serum ferritin concentrations have been associated to diabetes type II, metabolic disorders, dyslipidemia, and obesity. Systemic inflammation has also been linked to elevated serum ferritin as an acute phase response. Although the correlation between hypertension and serum ferritin in women was not conclusively proved and has generated debate, publications have revealed such association. (Lee, D.-H., 2018).

An critical cation, sodium (Na⁺) is vital for maintaining electrolyte balance and for many biological functions, including action potentials (signal transduction). The primary source of sodium (Na⁺) is table salt (NaCl), which comprises 40% sodium and is often used in all cuisine to enhance flavor. Another important mineral is potassium (K⁺), which is crucial for maintaining glucose homeostasis, electrolytic/fluid balance, and cellular metabolism. Banana, avocado, grains/beans, almonds, milk, and potatoes are the main sources of potassium. The maintenance of overall Na⁺ and K⁺ concentrations therefore depends on the Na⁺/K⁺ pump, in which Na⁺ flows into extracellular space and K⁺ moves inside cells. potassium's effect on HT is the reverse of that of Na⁺. Because potassium levels are higher and sodium levels are lower, the rise K⁺/Na⁺ proportion favor a hypotensive effect, reduce the risk of CVD and cerebrovascular disorders. (Chiu, H.-F., et al 2021).

Hypertension (HT) is defined medically as a chronic, continuous rise in arterial blood pressure (BP) that exceeds 140/90 Hg mm (systolic blood pressure/diastolic blood pressure), in accordance with National Institute for Health and Clinical Excellence—NICE criteria. HT is divided into main or vital (90–95%) and secondary (5–10%) components. Due to the