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ESTIMATION OF SOME IMPORTANT ESSINTIAL ELEMENTS LEVELS Se, Zn AND Fe IN THE SICKLE CELL ANEMIA PATIANTS SERUM IN BASRAH.

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Abstract

This study was performed to determine some essential elements such as selenium, zinc, and Iron in the serum of the sickle cell anemia patients and the results were compared with that of a control healthy group. The obtained results showed clear deficiency in selenium levels in patients serum (60-85) ng/ml compared with healthy control (95 – 130) ng/ml.

The result show a high deficiency in zinc level of sickle cell serum (0.70 –1.25) µg/ml as compared with health control (0.9 – 1.25) µg/ml.

On the other hand Iron shows a high level in patient serum (10 – 19) µg/ml as compared with healthy control (9.0 – 13) µg/ml.

الخلاصة

تم في هذه الدراسه تعيين بعض العناصر الضرورية مثل السلينيوم والزنك والحديد في مصل الدم لمرضى فقر الدم المنجلي حيث تم مقارنة النتائج لهؤلاء المرضى مع نتائج مجموعة من الاصحاء المتطوعين آظهرت النتائج آن هناك نقص واضح لمحتوى السلينيوم في المرضى (٦٠–٨٥) نانوغرام\مل مقارنة بمحتوى الاصحاء(٩٥–١٣٠) نانوغرام\مل , كذلك آظهرت النتائج آن مستوى الزنك منخفض في مصل دم المرضى(٠,٧٠–١,٢٥) مايكروغرام\مل مقارنة بمحتوى مصل الدم للاصحاء(٠,٩–١,٢٥) مايكروغرام\مل, من ناحية آخرى وجد آن مستويات عالية من الحديد في مصل المرضى (١٠–١٩) مايكروغرام\مل مقارنة بمحتوى الاصحاء (٩,٠–١٣) مايكروغرام\مل.

Introduction

Sickle cell anemia is a hereditary disorder with a high potential for oxidative damage due to a chronic redox imbalance in erythrocytes that often result in continous generation of reactive oxygen spacies (ROS) and to mild and sever hemolysis (1,2) . The production of (ROS) can be amplified in response to a variety of pathos physiological conditions such as; hypoxia, inflammation, infections, and deficiency of antioxidant vitamins (3).

Since the sickle cell anemia is a major public health problem in the southern in Iraq, this work is aimed to estimate the level of some important essential elements such as Se, Zn and Fe in the serum of the sickle cell anemia patient and compare their levels with that of healthy control groups.

Table – 1 concentration levels of Se, Zn and Fe

Life span Years		Se ng/ml		Zn μg/ml		Fe μg/ml	
		Control	Patient	Control	Patient	Control	Patient
5-15	Male	115-130	70-85	1.1 -1.3	0.74-1.05	1.02-1.24	2.12-2.3
	Female	105-120	60-68	1.0-1.3	0.70-1.14	1.1-1.28	0.12-2.3
15-30	Male	110-125	65-75	0.98-0.13	0.75-1.25	1.15-1.3	2.16-2.4
	Female	100-110	60-68	1.02-1.25	0.75-1.14	1.05-1.26	2.3-2.4
31-45	Male	100-110	60-70	0.9-1.2	0.75-1.1	1.1-1.3	2.2-2.9
	Female	95-105	60-65	1.0-1.2	0.9-1.1	1.0-1.2	2.4-2.6

Experimental

Fifty patients with sickle cell anemia (22 female and 28 male) aged [5- 45] years and other fifty healthy persons (22 female and 28 male) blood samples have been investigated.

A 5 ml of whole blood were collected into plain tubes and then centrifuged and the serum was separated into clean, properly labeled tubes.

The serum samples were analyzed for Se using Hydride generation (4) atomic absorption spectrometry at a wave length 196.1 nm with a 12 mA lamp current. Zinc analysis performed at 231.2 nm and Iron analysis was performed at a wave length 233.9 nm.

Serum sample was diluted [1:1] with 2M HCL as diluents before analysis are performed.

Results and Discussion

The results obtained were shown in table -1, which indicates a clear deficiency in the level of selenium and zinc as compared with the results of healthy control group. Since Selenium is a vital trace element for the efficient and effective operation of many functions of the human immune system and also Se is contained in a glutathione peroxidase which plays a major role in protection against free radical and oxidative stress (5). The sickle cell anemia patient suffers from a high oxidative stress due to selenium deficiency. It has been found that supplement of these elements to a sickle cell anemia patients will tend to meliorate some of sickle cell moni festatime (6).

The important of Zn is reflected by the numerous functions and activities over which it exerts a regulatory role and also needed for nucleic acid and glucose use and insulin secretion .The results

show high content of iron in serum of the patients due to continous destruction of red blood cells (7, 8 and 9).

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