# The Relationship Between Job and Some Biochemical Markers in Kirkuk General Hospital

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## Abstract

The study includes continues the changes in "Urea, creatinine, GOT, GPT, ALP, Total protein and Iron" concentrations with different radiation fields, this study conducted on (50) samples from workers and controlled ranging period time from one year to 28year it measured each of Urea, creatinine, GOT, GPT, ALP, Total protein and Iron collected samples each worker divided results by type radiation to four types from workers by fields (X-ray, Sonar, Ct-scan and Preterm infants).

Where results showed to Existence significant difference in GOT and ALP concentrations for the workers compare with control group, in X-ray fields and Sonar fields and CT-scan fields and Preterm infants fields.

#### INTRODUCTION

## **Electromagnetic Field**

With growth in mobile communications, exposure to nonionizing electromagnetic field (EMF) has increased due to mobile handset and base station antenna. EMF penetrates the animal body and act on all organs, altering the cell membrane potential and the distribution of ions and dipoles. These alterations may influence biochemical processes in the cell<sup>(1)</sup>.

It has shown that, Microwaves (as specially waves from electromagnetic in fields of cellular phones) cause to produce temprature and energy distribution in liver tissues<sup>(2)</sup>.In addition, these waves with extremely low frequency (in long term) make to get some variations in strructure and Biochemical properties of the tissues<sup>(3)</sup>.

#### Ultraviolet (UV)

Ultraviolet (UV) radiation (200-400 nm), an important part of the sun energy, is major devided to 3 sub-groups depending on wavelengths. It is known as UVA (400-320 nm), UVB (320-290 nm), and UVC (290-200 nm) (4). The most energy one is UVC (5). UVC and UVB are absorbed by nucleic acids (NCs), and (NCs) and amino acids less absorb UVA, it cause oxidative events. Due to different properties, UVC and UVB stimulate the apperance of stress properties more effectively than UVA (6.) Sun photosensitivity attact, reactions, and immunosuppression are very effects of UV radiation (7). Chemical Biological changes cover the release of histamine and the derivative products of arachidonic acid, such as cyclooxygenases and lipooxygenases, kinins, and cytokinin, may be in epidermal and dermal cell types (8). It documented that UV radiation generated oxidative stress (9,10,11) and an increase in radiation dose caused functional changes in various physiological systems in

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animals36.

#### Serum creatinine

Creatinine is the non-enzymatic breakdown product of creatine and phosphocreatine (almost exclusively found in skeletal muscle). Daily production is constant in an individual. It is excreted mainly by filtration at the glomerulus, but is also secreted to a certain extent (up to 15%) by the tubules<sup>(13)</sup>.

#### Serum urea

Urea is synthesised predominantly in the liver (byproduct of protein catabolism). Production is increased by high protein intake, catabolic states, breakdown of blood in the gut lumen in GI bleeding and tetracycline<sup>(13)</sup>.

#### Aspartate aminotransferase

Aspartate aminotransferase (glutamate oxaloacetate aminotransferase, GOT) is present in high concentrations in cells of cardiac and skeletal muscle, liver, kidney and erythrocytes. Damage to any of these tissues may increase plasma AST levels<sup>(13)</sup>.

#### Alanine aminotransferase

Alanine aminotransferase (glutamate pyruvate aminotransferase, GPT) is present in high concentrations in liver and, to a lesser extent, in skeletal muscle, kidney and heart<sup>(13)</sup>.

#### Alkaline phosphatase

The ALPs are a group of enzymes that hydrolyse organic phosphates at high pH. They are present in most tissues but are in particularly high concentration in the osteoblasts of bone and the cells of the hepatobiliary tract, intestinal wall, renal tubules and placenta<sup>(14)</sup>.

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## Aminotransferases (alanine and aspartate)

A rise in plasma aminotransferase activities is a sensitive indicator of damage to cytoplasmic and/ or mitochondrial membranes<sup>(15)</sup>.

#### Alkaline phosphatase

Alkaline phosphatase is derived from a number of different tissues, including the liver, the osteoblasts in bone and the placenta<sup>(16.19)</sup>.

#### Total plasma proteins

Acute changes in proteins are often due to loss from, or gain by, the vascular compartment of protein-free fluid, rather than of protein. Only marked changes of major constituents, such as albumin and immunoglobulins, are likely to alter total protein concentrations significantly<sup>(17)</sup>.

#### Serum iron concentrations

Serum iron concentrations should be measured urgently in all patients who may have ingested more than 30 mg/kg of elemental iron<sup>(18)</sup>.

#### **MATERIALS AND METHODS**

#### Study design

This is a cross sectional study. Approval and permission to perform the study were obtained from the college of applied science Samarra university, Salahdin Health Directorate office in the endocrine clinic of Samarra General Hospital. in the period from February 2019 until February 2020.

#### patients

This study was carried out on both adults gender aged (20-58) years they were not suffer from chronic disease. A total of 50 patient were fit to the inclusion criteria of this study only the patients was conducted in the laboratory of the study included 48 patients while the reset escapes the study.

#### Blood sampling.

Blood samples were obtained from the two groups. All subjects were invited to a quiet room. Sterilized disposable syringes (G21 needle) and plane plastic tube and EDTA plastic tube. Blood samples of 5mls were taken from antecubital vein puncture were divided into two parts one to EDTA tube the rest transferred to plane tube then left to clot for 30 minutes at room temperature to obtain serum by centrifugation at3000rpm for 10 minutes and make bio chemical taste directly.

#### **RESULTS AND DISCUSSION**

In my research I found the "Urea, Creatinine, GPT, Total Protein and Iron" had no significant differences Compare with control group but level concentrations of "Urea, Creatinine, GPT, Total Protein and Iron" is higher and had significant differences in "GOT and ALP" Compare with control, while the decline was evident in the Figs. (1) & Table (2).

#### The worker in Sonar fields

In my research I found the "Urea, Creatinine, GPT, Total Protein and Iron" had no significant differences Compare with control group but level concentrations of "Urea, Creatinine, GPT, Total Protein and Iron" is higher and had significant differences in "GOT and ALP" Compare with control, while the decline was evident in the Fig. (2) & Table (4).

#### The workers in CT-scan fields

In my research I found the "Urea,Creatinine,GPT,Total Protien and Iron" had no significant differences Compare with control group but level concentrations of "Urea,Creatinine,GPT,Total Protien and Iron" is higher and had significant differences in "GOT and ALP" Compare with control, while the decline was evident in the Fig.(3)& Table (4).

#### The workers in Preterm infants fields

In my research I found the "Urea,Creatinine,GPT,Total Protien and Iron" had no significant differences Compare with control group but level concentrations of "Urea,Creatinine,GPT,Total Protien and Iron" is higher and had significant differences in "GOT and ALP" Compare with control, while the decline was evident in the Fig.(4)& Table (5)

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## **FIGURES**



Figures 1. Levels of Urea, Creatinine, GPT, GOT, ALP, Total Protien and Iron for the workers in X-ray fields with control.

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Figure 2. Levels of Urea, Creatinine, GPT, GOT, ALP, Total Protien and Iron for the workers in Sonar fields with control.



Figures 3. Levels of Urea, Creatinine, GPT, GOT, ALP, Total Protien and Iron for the workers in CT-Scan fields with control.

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Figures 4. Levels of Urea, Creatinine, GPT, GOT, ALP, Total Protien and Iron for the workers in Preterm infants fields with

Hospital control.

## TABLES

Table 1. This table show the instruments and kits used in this research

No.	Instrument	Company
1	Centrifuge	Hermle,Japan.
2	Incubator	Memmert,Germany.
3	Micropipette	Oxford,USA.
4	Plan tubes	Jordon
5	Refrigerator	Concord,Italy.
6	Spectrophotometer UV/Vis(CE2020)	Cecil,England.
7	Kit UREA	Biomaghreb
8	Kit CREATININE	Biomaghreb
9	Kit AST/GOT	Biomerieax
10	Kit ALT/GPT	Biomerieax
11	Kit ALP	BIOLABO
12	Kit Total Protein	Biomaghreb
13	Kit Iron	Biomaghreb
14	Water Bath	Memmert.Germany.

Table 2. Some biochemical markers for Workers in X-ray fields.

Parameter		Mean ± Std. Deviation	N	sig	
Urea	Normal	14.860 ± 1.176	10	120	
Urea	X-ray	15.905 ± 1.330	10	.138	
Creatinine	Normal	0.530 ± 0.267	10	401	
Creatinine	X-ray	$0.648 \pm 0.038$	10	.401	
GPT	Normal	22.194 ± 6.296	10	042	
GPT	X-ray	29.490 ± 4.140	10	.043	
GOT	Normal	10.061 ± 3.086	10	000	
GOT	X-ray	18.288 ± 1.206	10	.000	
ALP	Normal	133.625 ± 24.002	10	007	
ALP	X-ray	178.930 ± 36.685	10	.007	
TotalProtien	Normal	74.589 ± 5.040	10	.012	
TotalProten	X-ray	66.863 ± 4.274	10		
Iron	Normal	16.125 ± 2.231	10	045	
Iron	X-ray	18.650 ± 1.240	10	.045	

Table 3. Some biochemical markers for Workers in Sonar fields.

Parameter		Mean ± Std. Deviation	N	Sig	
Urea	Normal	14.860 ± 1.176	10	.760	
Urea	Sonar	14.590 ± 0.863	10		
Creatinine	Normal	$0.530 \pm 0.267$	10	F04	
Creatinine	Sonar	$0.665 \pm 0.191$	10	.504	
GPT	Normal	22.194 ± 6.296	10	060	
GPT	Sonar	23.110 ± 15.401	10	.808	
GOT	Normal	10.061 ± 3.086	10	001	
GOT	Sonar	19.675 ± 1.450	10	.001	
ALP	Normal	133.625 ± 24.002	10	006	
ALP	Sonar	190.500 ± 24.749	10	.006	
TotalProten	Normal	74.589 ± 5.040	10	627	
TotalProten	Sonar	72.755 ± 5.720	10	.637	
Iron	Normal	16.125 ± 2.231	10	124	
Iron	Sonar	13.000 ± 6.081	10	.134	

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**Table 4.** Some biochemical markers for Workers in Ct-scan fields.

Parameter		Mean ± Std. Deviation	N	Sig	
Urea	Normal	14.860 ± 1.176	10	000	
Urea	Ct-scan	32.776 ± 16.785	10	.000	
Creatinine	Normal	0.530 ± 0.267	10	002	
Creatinine	Ct-scan	0.992 ± 0.127	10	.002	
GPT	Normal	22.194 ± 6.296	10	000	
GPT	Ct-scan	43.788 ± 3.807	10	.000	
GOT	Normal	10.061 ± 3.086	10	000	
GOT	Ct-scan	26.792 ± 2.289	10	.000	
ALP	Normal	133.625 ± 24.002	10	000	
ALP	Ct-scan	257.128 ± 30.213	10	.000	
TotalProten	Normal	74.589 ± 5.040	10	101	
TotalProten	Ct-scan	78.644 ± 7.660	10	.181	
Iron	Normal	16.125 ± 2.231	10	007	
Iron	Ct-scan	15.960 ± 4.076	10	.907	

Table 5. Some biochemical markers for Workers in Preterm infants fi	ields.
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Parameter		Mean ± Std. Deviation	N	%
Urea	Normal	$14.860 \pm 1.176$	10	600
Urea	P.infants	14.492 ± 1.961	10	.609
Creatinine	Normal	$0.530 \pm 0.267$	10	777
Creatinine	P.infants	$0.494 \pm 0.125$	10	.///
GPT	Normal	22.194 ± 6.296	10	224
GPT	P.infants	25.234 ± 3.827	10	.324
GOT	Normal	10.061 ± 3.086	10	012
GOT	P.infants	14.456 ± 3.317	10	.013
ALP	Normal	133.625 ± 24.002	10	006
ALP	P.infants	173.000 ± 26.749	10	.006
TotalProten	Normal	74.589 ± 5.040	10	.249
TotalProten	P.infants	71.408 ± 5.854	10	
Iron	Normal	$16.125 \pm 2.231$	10	001
Iron	P.infants	$16.280 \pm 1.941$	10	.091