SERUM COPPER LEVEL AS A MARKER OF PELVI-ABDOMINAL SWELLINGS

THESIS

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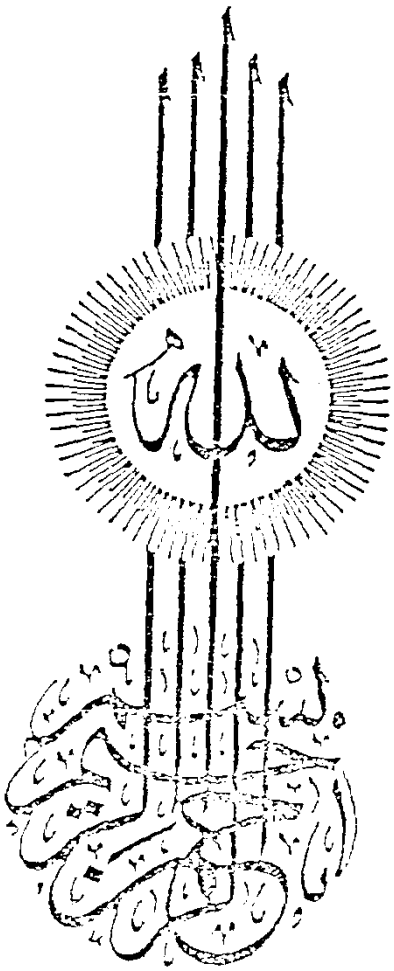

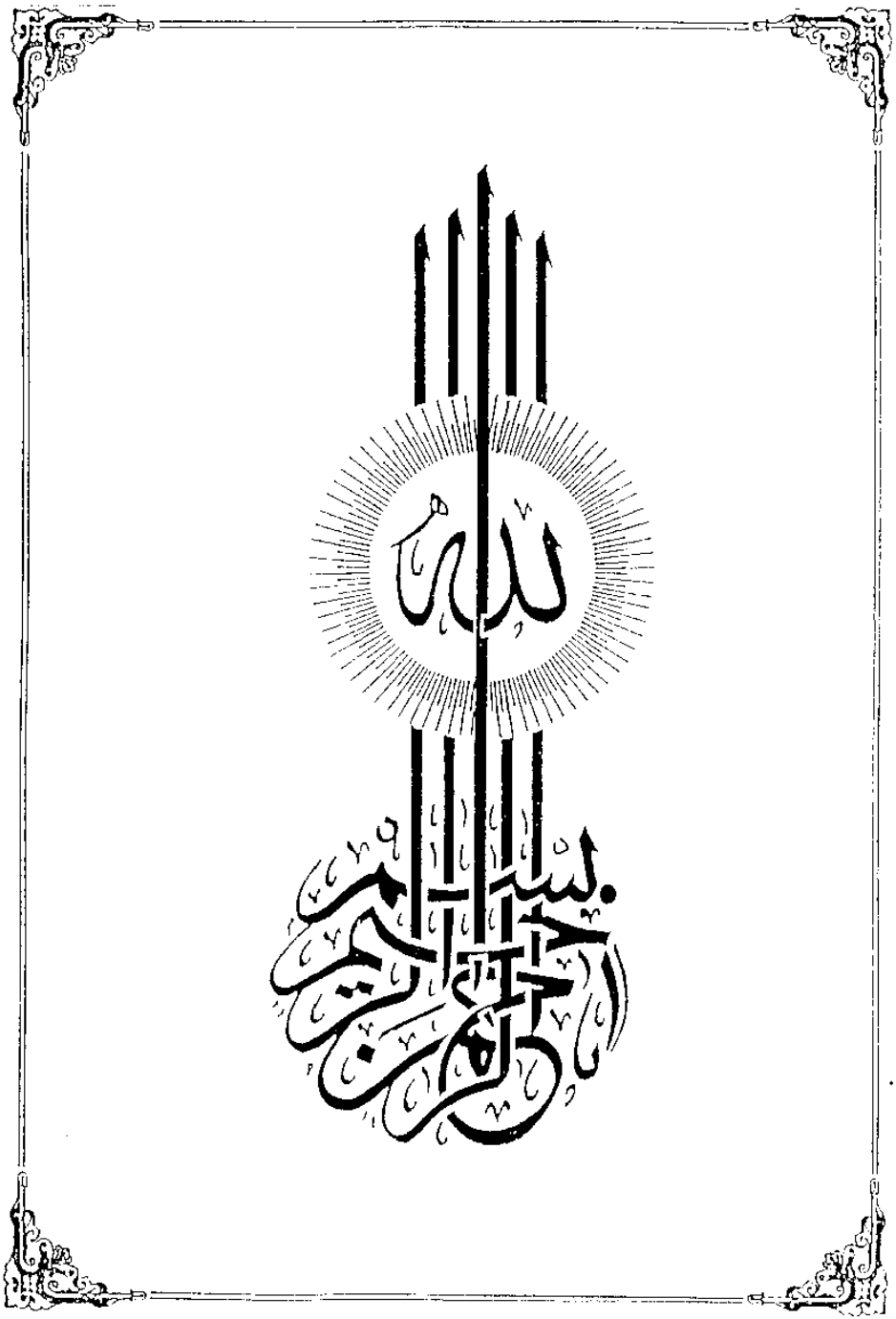

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CONTENTS

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INTRODUCTION

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The presence of copper in living tissue was recognized by Bucholz (1818). The first evidence that copper plays an important role in vertebrates was provided by Hart et al. (1928), who showed its importance in prevention of anemia.

The progress about the role of copper for the sustenance of health was made when naturally occuring deficiency states in a number of domestic animals were discovered in cattle, sheep and pigs feeding on plants grown in copper deficient soil in North America, Europe and Australia (Bender, 1982).

Kulholma et al., 1984, observed a positive correlation between serum free estriol and serum copper levels. The rise of serum copper is due to the increase of serum ceruloplasmin level caused by increased estrogen production.

It is well known now that the changes in estriol level is one of the important parameters for monitoring neoplasms (Schenker et al. 1978).

At the same time, it is affected by the state of the maternal kidneys, and unrelated substances may be measured in addition to measuring only one part of estrogens. Therefore, the need for an easy and more accurate method for monitoring estrogen state is great.

Ceruloplasmin is a glycoprotein (alpha-2-globulin) containing 3mg. of copper/g. It plays an important role in copper transport, regulation of biogenic amines for brain chemistry and liver protection against accumulation of excess copper (Prasad, 1978).

The possible mechanisms to explain the rise of ceruloplasmin level is that, estrogne may act as an inducer for the synthesis of ceruloplasmin R.N.A. templates, resulting in a subsequent increase in ceruloplasmin (Schenker et al. 1978).

Since serum copper changes could reflect oestrogen changes, and the estimation of the later is difficult and cost, many investigators resort to estimate serum copper level instead of oestrogen level.

Schenker, is one of the pioneer investigators in

this field. He and his co-authors, published an outstanding article on 1985, about the relation of serum copper level and pelvi-abdominal mass. They stated that serum copper level above 150 ug/dl was found in malignant tumour while lower levels were associated with benign tumours.

AIM OF THE WORK

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To evaluate the precision of serum copper level estimation as an indicator of the pathological nature of pelvi-abdominal tumours. Our results will be statistically analysed.

MATERIALS AND METHOD

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HUMAN SUBJECTS

Our study will included 70 ladies, divided into two groups:-

1. Goup A

Fifty ladies having Pelvi-abdominal masses as a study group.

2. Group B

Twenty ladies having non gynaecological troubles will be taken as a control group.

Serum Samples

Ten ml. of blood was drawn from an antecubital vein, using stainless steel needles and plastic syringes and collected in metal free glass tubes (10 ml.) After an hour, it was centrifuged at 3,000 rpm for 10 minutes to separate the serum from the clotted blood. Clear serum was transferred to a plastic tube (5ml) and kept at -20^{o}C being frozen until analyzed.

All blood samples from the two groups were collected in mid-morning, 3 hours after breakfast.

MEASUREMENT OF SERUM COPPER AND ZINC

Serum copper and zinc were measured in an updated computerized atomic absorption spectrophotometer.

Bowman, 1962, noticed the usefulness of this method for analysis of different method.

The instrument was attached to a graphite furnace to eliminate molecular absorption and other interference. The instrument includes a self-contained simultaneous double-beam background correction system with a deuterium arc and a tungston halide source.

Direct concentration was obtained by programming the instrument with 1 standard solution that lies in the linear scale.

The apparatus was adjusted for analysis of each element according to the following table:-

	Copper	Zinc
Wavelength n.m	324.8	213.9
Slit width mm	0.1	0.1
Lamp current mA	5	10
Burner type	10cm Air - Acetylene burner	
Airflow L/min	4.5-5.5	4.5-5.5
Integration Period (Sec.)	4	4