STUDY OF TISSUE LEVELS OF SOME TRACE ELEMENTS IN INTESTINAL BILHARZIASIS

THESIS

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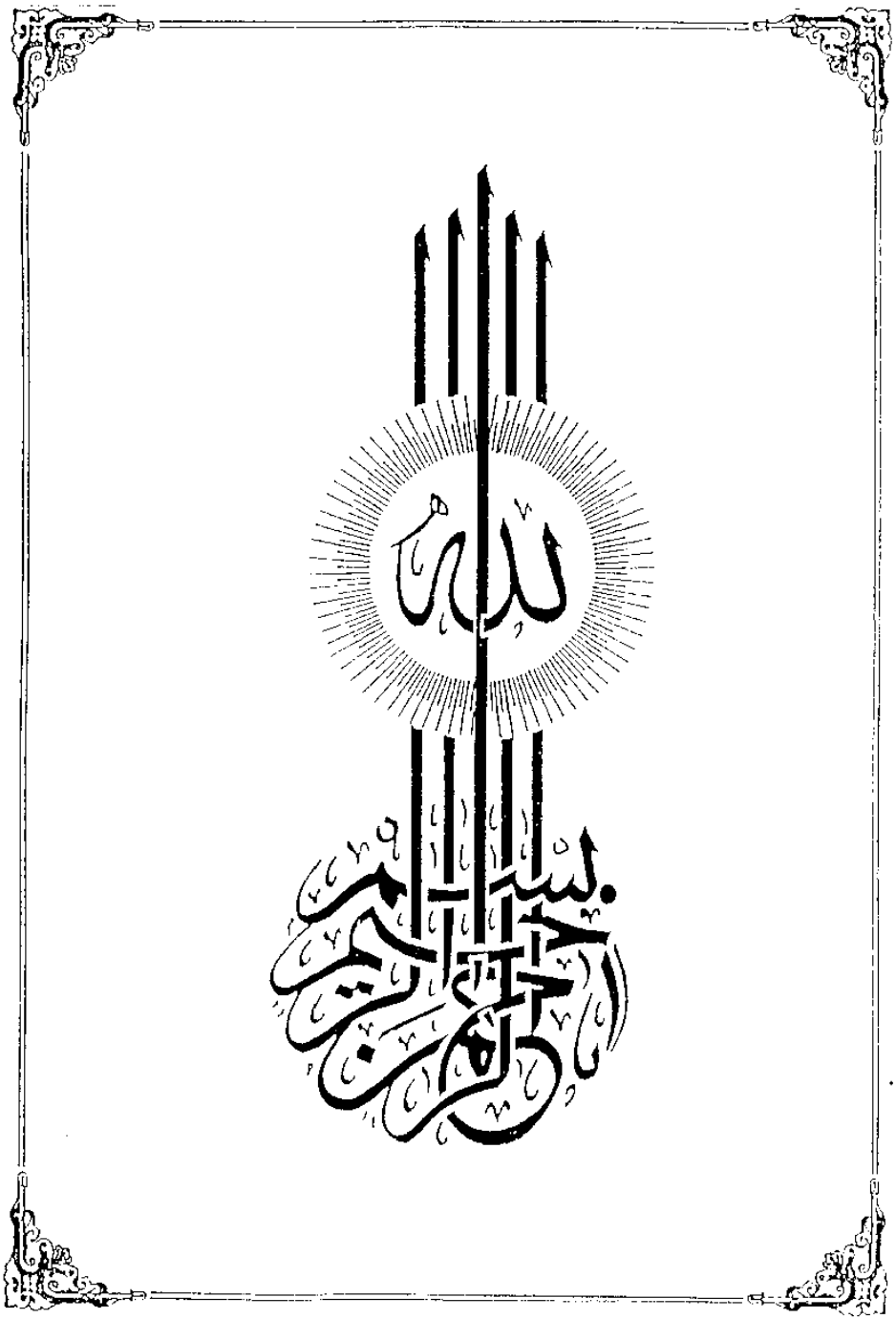

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INTRODUCTION

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Certain elements although present in minute amounts in tissues are termed essential nutrient. In accordance with present knowledge, the national academy of science's description and dietary recommendations, the inorganic elements or minerals were treated under four headings (Howard et al.,1977).

First, the essential macro nutrients (needed in amounts of 100 mg/day or more) as : calcium, phosphorous, sodium, potassium,chlorine magnesium and sulfur. Secondly these minerals include essential micronutrients (Trace elements needed in amounts no more than a few mg/day) as iron, Copper, Cobalt, Zinc, Manganese, Iodine, Molybdenum, Selenium, Fluorine and Chromium. Thirdly, the micro nutrients that may be essential for the human as: tin, nickel, silicon, vanadium. Fourthly, the trace contaminants as lead, cadmium, mercury, arsenic, barium, strontium, boron, aluminum, beryllium and rubidium.

Although the essential minerals nutrients are present in only a small fraction of the total body tissue they are required for various metabolic processes in body metabolism. They are interrelated

to each other so that a deficiency of one inorganic element may affect the functioning of another. Additionally, the quantity of an essential mineral may not indicate its importance in body function. A very small amount of one mineral can be as essential as large quantities of another. Recently it has become apparent that man can suffer adverse effects from nutritional deficiencies of essential trace elements as copper (Al Rashid and Spangler, 1971) and Zinc (Halsted et al.,1972).

Human schistosomiasis is one of the major health problems of increasing importance in different parts of the world. It headed the list of ocommunicable disease in Egypt, both as regards its prevalence, and its great repercussions on the national economy of our country.

Children acquire the disease early in life in rural endemic areas, so that the disease is now considered a pediatric health problem , besides being an occupational and an Environmental hazards (Mousa, 1976).

AIM OF THE WORK

1. To study the levels of some trace elements (as Cu, Zn, Mg, Mn and Vanadium) in the liver tissue of active intestinal bilharziasis without ascites.
2. To study the levels of the same elements in the liver tissue of active intestinal bilharziasis with ascites.

REVIEW OF LITERATURE

EPIDEMIOLOGY OF SCHISTOSOMIASIS

Schistosoma is one of the oldest known diseases. The ancient Egyptians knew it and recognized haematuria as one of its symptoms (Mousa, 1962).

Bilharziasis is the most prevalent disease in Egypt affecting 20 million of population and reducing the total economic output by one third (Ayad, 1974). In Egypt both Schistosoma mansoni and Schistosoma haematobium have been found to be widely distributed. The disease is more common in lower Egypt especially in the northern part of the Nile Delta where both species exist while it is rare in upper Egypt where haematobium infection predominates (Mousa, 1976).

No age is exempt from bilharziasis, children and young adults are its common victims (Makar,1967). The high prevalence of bilharziasis among children was attributed to their increased exposure through playing and swimming in canals which are infected (Jordan, 1961).

The cause of the reduced prevalence in adults is not clear. Many authors thought that the decline in infection rate in adults is in part due to immunity (Farooq, 1966). All surveys conducted in Egypt showed that the infection rates of bilharziasis are higher

in males than females (Farooq, 1966) This is true for all ages except the youngest females up to 5 years have a higher infection rate (El-Zawahry, 1962) .
The invasion occurs by the penetration of the cercariae through the skin, migration of the schistosomulae to the liver causing slight inflammatory reaction in the skin, lungs and the liver. The worms become mature and the young couples of Schistosoma mansoni and Schistosoma japonicum descend in the portal vein against the blood stream to the branches of the mesentric veins and to the main sites of oviposition in the intestinal wall, (Hammam et al.,1976).

The toxemia appears to be an allergic reaction to metabolic products of maturing schistosomes and to their ova at the onset of oviposition. The symptoms may be nausea, vomiting, diarrhea, cough, localized signs such as an enlargement of the liver and spleen. Sometimes this stage may be completely asymptomatic (WHO, 1965).

Schistosomiasis is a disease of the protal system, so the liver is expected to be affected in nearly every case. The various reactions depend on the intensity of hepatic invasion which may pass from preclinical stage to the advanced fibrotic liver (Saleh, 1962).

Bilharzial liver affection is produced by prolonged and repeated embolization of the liver by ova which may have drifted back from the portal territories (Warren, 1961).

Dimette (1956), in his study on livers from Egyptian children and adults by biopsy revealed that the most important etiological agents responsible for fibrosis are first schistosomes and next malnutrition.

By needle biopsy studies, it was possible to demonstrate that 60 - 70 % of hepatosplenomegalic cases were bilharzial hepatic fibrosis (Abdine, 1963). 50 % of these cases are of bilharziasis alone and the other 50 % are complicated mostly by nutritional defects or post viral lesions (Erfan et al.,1957).

Bilharzial hepatic fibrosis in Egypt is mostly due to Schistosoma infection (Giffer, 1945; Hidayat, 1949; Mousa et al.,1965).

Erfan (1947), stated that bilharzial hepatic fibrosis is due to infection with Schistosoma mansoni, sometimes to both Schistosoma mansoni and Schistosoma haematobium and rarely to Schistosoma hematobium only.

Hidayat (1949), found that the incidence of hepatosplenic schistosomiasis of pure Schistosoma mansoni was 62.6 % and of pure Schistosoma haematobium 14.4 %.

PATHOLOGY OF SCHISTOSOMIASIS

Intestinal Schistosomiasis:

Elwi (1967), reported that in 84 % of autopsies of cases with schistosomiasis, the intensity of the infection of the intestine is very mild to the extent that the lesions do not show gross changes and are diagnosed by finding schistosome eggs in scrapings from intestinal mucosa or in histologic lesions. The earliest lesions were described by Arafa (1962). Sigmoidoscopy revealed a diffuse or patchy hyperaemia of the mucosa. The affected area was oedematous and friable and bled when touched with the tip of the sigmoidoscope.

The late lesions showed basically as gross induration of the intestine with sandy patches in 16 % of cases of intestinal schistosomiasis (Mehrez and El-Afifi, 1962; Alyan et al.,1969) Elwi (1967), reported that one half of the autopsies presenting gross induration and sandy patches of the intestine, display also schistosomal polyposis i.e. the incidence of schistosomal polyposis is 8 % among all cases of intestinal schistosomiasis.

The site of schistosomal polyposis of the intestine in Egypt was 60.6 % in the rectum, 12 % in the sigmoid colon and 27.2 % in the rectosigmoid region (Dimette and Sproat, 1955). Schistosoma mansoni eggs were found in 52.2 % Schistosoma haematobium eggs in 30.2 % while a combination of eggs of both species was found in 17.6% of the polyps. (Dimette and Sproat, 1955). The polyps bleed easily on touch and often have greyish necrotic tips. Rectal polyps may sometimes prolapse through the anus as cauliflower masses (Woudruff, 1979). The association of Schistosoma japonicum of the large intestine with carcinoma was first reported in 1921 by Kazama who accepted a causal relationship between schistosomiasis and the malignant process.

Ferguson (1913), Dolbey and fahmy (1924) and Barsoum (1934), reported the association of schistosomiasis and carcinoma of the large intestine in Egypt but they denied a causal relationship.

Dimette et al.,(1956), reported that in 1.3 % of schistosomal polyps of the large intestine there were areas of adenomatoid hyperplasia with nuclear alteration which resemble those usually classified as "precancerous" in adenomatous polyps.