# PANCREATIC AND MYOCARDIAL INVOLVEMENT AMONG EGYPTIAN CHILDREN WITH TYPHOID FEVER

THESIS
Submitted For Partial Fulfilment of
The Master Degree in
**Pediatrics**

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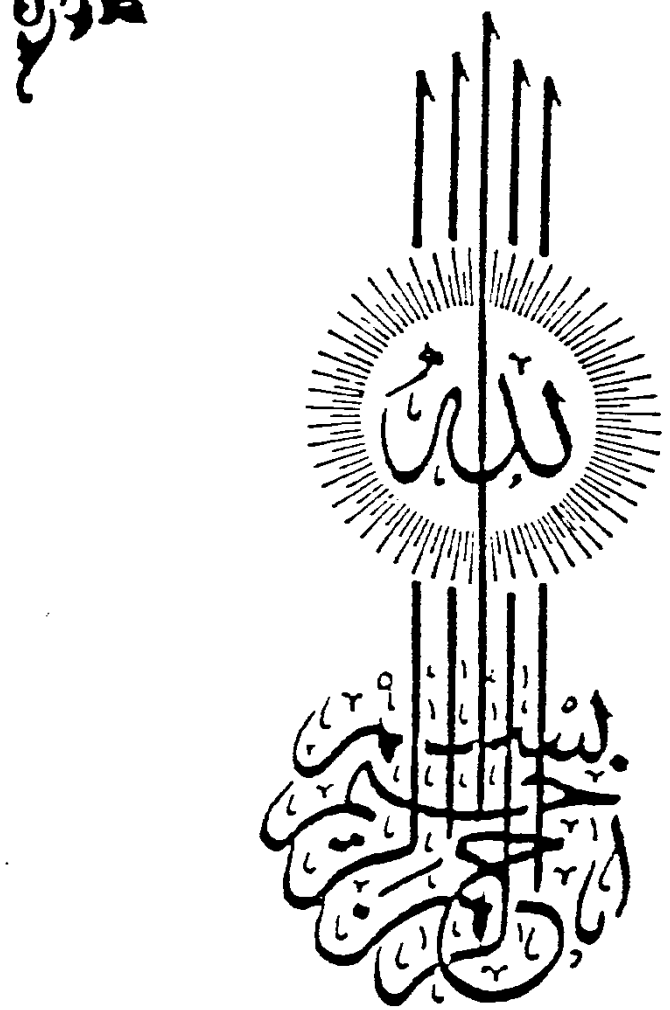
**1993**



قَالُوا سُبْحَانَكَ لَا عِلْمَ لَنَا إِلَّا مَا
عَلَّمْتَنَا إِنَّكَ أَنْتَ الْعَلِيمُ الْحَكِيمُ.

صَدَقَ اللهُ الْعَظِيمُ
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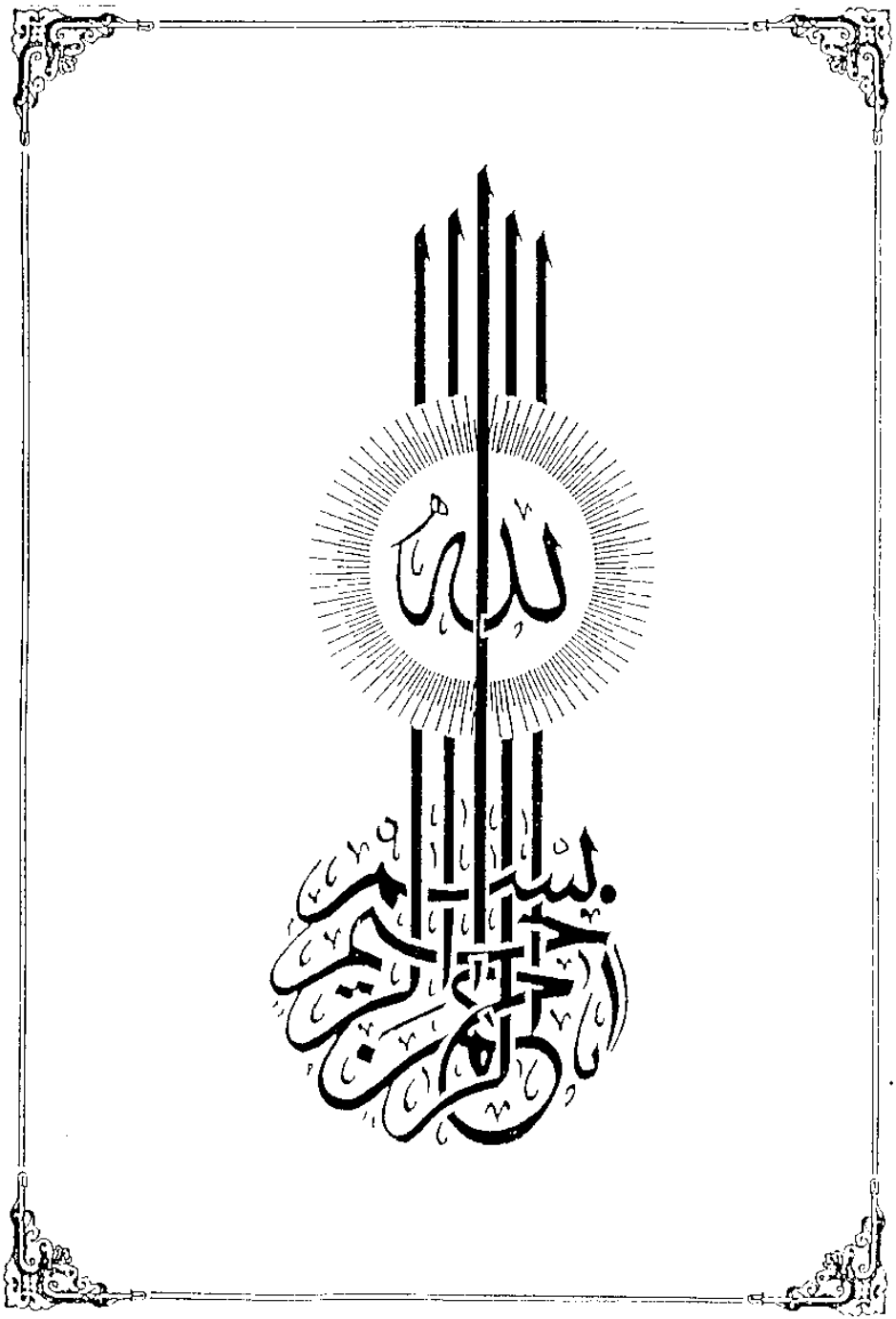

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Special thanks are for **my mother and my family** for their sincere encouragement, patience and continuous support.

# List of Abberviations.

| | |
|---|---|
| IGM | : Immunoglobulin "M" |
| IgG | : Immunoglobulin "G" |
| IgA | : Immunoglobulin "A" |
| Ab | : Antibodies |
| LMIT | : Lymbhocyte Migration Inhibition test. |
| CMI | : Cell Mediated Immunity. |
| SGOT | : Serum glutamic Oxalo-acidic transferase. |
| BMAC | : Bone Marrow Aspiration Culture. |
| Max | : Maximum. |
| S.D | : Standard Deviation. |
| VS. | : Versus. |
| ELISA | : Enzyme Linkage Innunosorbant Assay. |
| N.S | : Non - Signeficant. |
| chlaramphenicol S. | : Chloramphenicol Sensetivity. |

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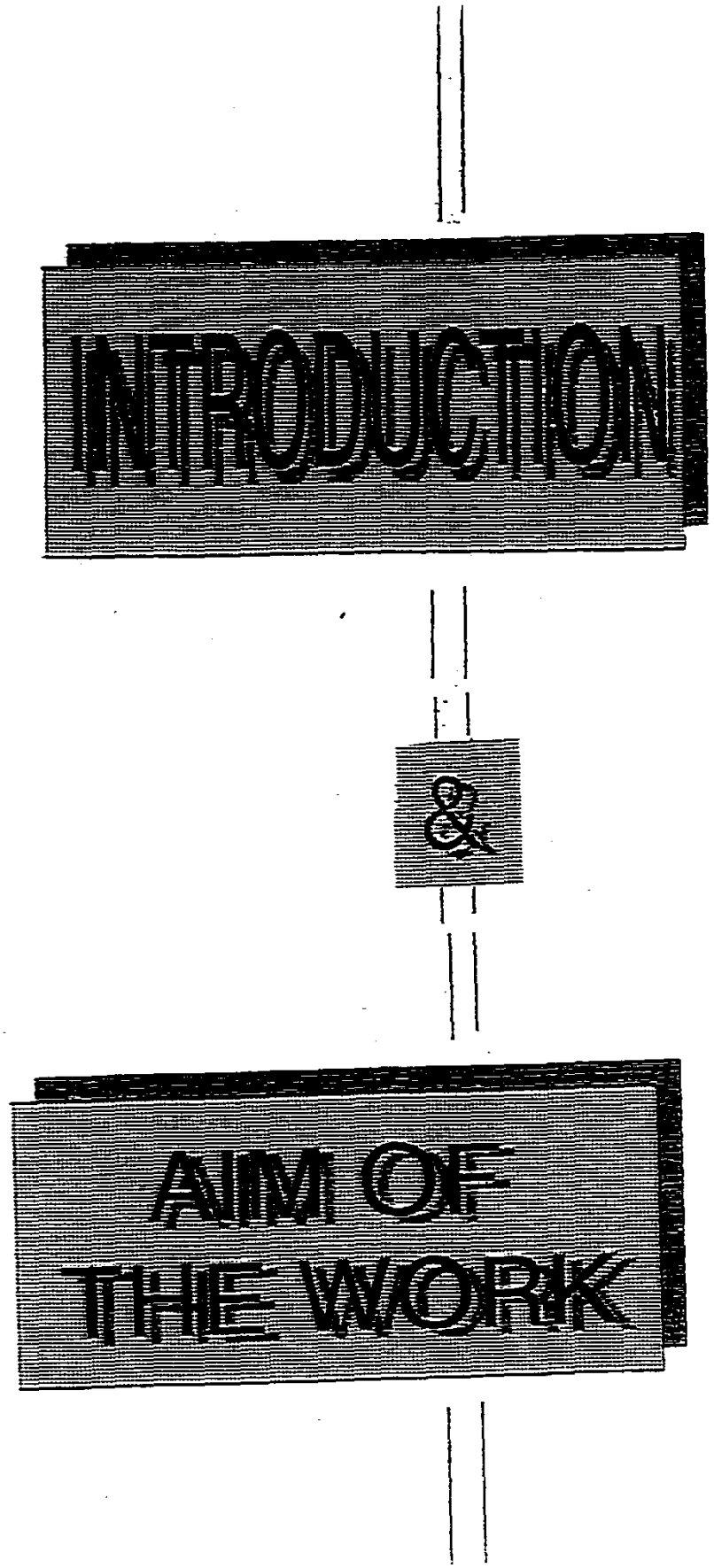

# INTRODUCTION

Typhoid fever is one of the commonest diseases in Egypt. It is of worldwide distribution and is particularly prevalent throughout the tropics **(Manson, 1982)**. Eighty five percent of enteric fevers are caused by typhoid bacilli and the rest (15%) are due to paratyphoid A, B and C bacilli **(EL Akkad, 1970)**.

The complications of typhoid fever are typhoid haemorrhage (1.5%), typhoid perforation (1%), toxic myocarditis, typhoid carrier, typhoid relapse and chronic salmonellosis **(Saif El Din and Abdel Wahab, 1991)**.

Pancreatic enzymes changes are commonly observed in salmonella typhi infection even without abdominal symptoms, **(Hermans et al., 1991)**.

The effects of salmonella typhi on heart have varied from minor alteration in the electrocardiogram to rhythm disturbances and rarely a true picture of myocarditis has been observed **(Khosla, 1981)**.

Electro-cardiographic abnormalities are said to occur in the majority of cases of typhoid fever either during the acute illness or during the convalescence **(Chowdhary et al., 1974)**.

A few of these changes are known to reverse either spontaneously with recovery from the disease process or after administration of heavy doses of nicotinic acid **(Khosla, 1981).**

The ECG abnormalities were invariably related to the severity of the disease. The more serious the profile of the disease in the patient the worse were the changes in the ECG as well as the prognosis **(Khosla, 1981).**

The heart is invariably involved in typhoid fever. The damage to the myocardium is of anatomical nature, in the form of cloudy swelling or hyaline degeneration of the myocardial fibres with necrotic foci of microscopic size and infiltration of the heart muscle either interstitial or focal may be found **(Khosla, 1981).**

**Aim of the work:**

Our aim in this work is to evaluate the incidence of pancreatitis clinically and subclinically among cases of typhoid fever.

We aim as well to assess possibility of myocardial involvement in the same patients, in a trial to demonstrate any epidemiological shift or drift in the pattern of typhoid presentation and manifestation.

# REVIEW OF LITERATURE

# TYPHOID FEVER

**Definition:**

Typhoid fever is an acute systemic illness caused by infection with Salmonella typhi. It is characterized by prolonged fever, sustained bacteremia without endothelial or endocardial involvement and bacterial invasion or multiplication within the mononuclear phagocytic cells of the liver, spleen, lymph nodes and Peyer's patches. Paratyphoid fever is a pathologically and clinically similar but generally milder illness that is caused by many species of salmonellae but most commonly by S.paratyphi A, S.schottmuelleri, and S.hirschfeldii. Enteric fever refers to either typhoid or paratyphoid fever **(Hoffman, 1991).**

## Epidemiology of Typhoid Fever.

**Etiology (Bacteriology):**

Salmonella bacilli are members of the Enterobactericae group of organisms **(Cheesbrough, 1985).**

Salmonella typhi is similar to other salmonella in that it is a gram negative, flagellated, non-encapsulated, non-sporulating, facultative anaerobic bacillus. It ferments glucose and reduces nitrate to nitrite **(Hoffman, 1991).**

They grow readily on simple media. They tend to produce hydrogen sulfide and they fail to produce indole or

hydrolyse urea and methyl red reaction is positive but Vagus Proskawer (V-P) is negative **(Jawetz et al., 1982).**

The thermal death is 60°C but they can withstand freezing and dry conditions for prolonged periods of time **(Kumar and Clark, 1991).**

Salmonellae are subdivided into species designated by name or antigenic formula **(Hoffman, 1991).**

The various salmonella are differentiated on basis of biochemical reactions and serologic reactions i.e agglutination patterns with O,P and Vi homologous antisera **(Hoffman, 1991).**

Serologic classification using the Kauffman-white agglutination scheme of antigenic analysis is summarized in table 1, while biochemical differences between S.typhi, S.paratyphi A, S.paratyphi B(Schattmulleri) are summarized in table 2.

**Table 1**

Antigenic analysis by the Kauffman-white scheme of organisms causing Typhoid fever, Typhoid and paratyphoid fever.

| | O-Antigen group | O-Antigens | H-Antigens phase 1 | H-Antigens phase 2 | Vi-Antigen |
|---|---|---|---|---|---|
| S.paratyphi | A | 1,2,12 | a | | - |
| S.Schottmuelleri | B | 1,4,5,12 | b | 1.2 | - |
| S.Hirsthfeldii | C | 6,7 | c | 1,5 | Vi |
| S.Typhi | D | 9,11 | d | | Vi |

**Table 2**

Biochemical differences between S.typhi, S.paratyphi-A and S.schottmuelleri **(Koneman et al., 1988).**

| | S.typhi | S.paratyphi-A | S.schottmuelleri |
|---|---|---|---|
| Acid from glucose | + | + | + |
| Gas from glucose | - | + (Trace) | + |
| Hydrogen sulfide production | + (Traces) | - (10%late+) | + |
| Citrate utilization | + | - (25%late+) | + |
| Lysine decarboxylase | + | + | + |
| Ornithine decarboxylase | - | - | + |

On basis of clinical application, it is preferred to use the taxonomy of Bergey's manual.

Genus salmonella:

Subgenus I:- Salmonella choleraesuis -S.typhi.

- S.typhi murium -S.schottmuelleri.

- S.paratyphi A -S.entertidis.

- S.gallinarium

Subgenus II : - S.salamae

Subgenus III: - S.arizonae

Subgenus IV: - S.houtenae

Subgenus V : - S.bonori **(Koneman et al., 1988).**

From these only four serotypes are essentially human pathogens namely Salmonella typhi, S. paratyphi, A., S.paratyphi, B and S.paratyphi, C **(Cruickshank et al.,1980).**

**Prevalence and incidence:**

Typhoid fever continues to be a major world health problem with hundred thousands of cases occurring every year in areas where economic, political and sociocultural factors impede development in general and advance in sanitation in particular **(Hook, 1984).**

It has been estimated that the world wide incidence of typhoid fever is approximately 12.5 million cases per year, with greater than 62% of cases occurring in Asia and 35% in Africa. In some areas it has been estimated that typhoid fever is responsible for 2 to 5% of all deaths **(Hoffman, 1991).**

In Egypt, in spite of the improvement of the socio-environmental condition of the population and extensive networks of public health services yet, enteric fever is more or less endemic **(Maklad, 1986).**

Statistics showed that the incidence of typhoid fever was steadily rising every year up to 1963. Since 1964 morbidity rate started to decline (El Akkad, 1970).

According to ministry of public health' reports the morbidity rates of typhoid fever have declined.Some authers