# ANTIBODY RESPONSE TO TOPV (SABIN) AND KILLED POLIO VACCINE (SALK) DURING THE FIRST YEAR OF LIFE IN EGYPT

**THESIS**

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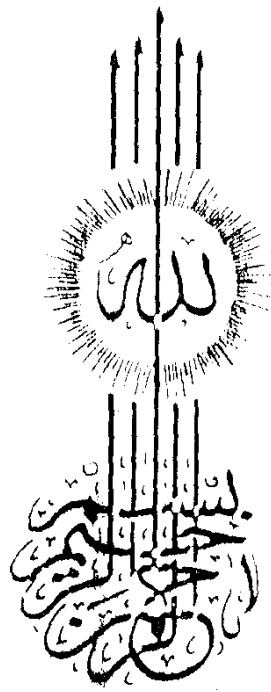
**1983**



قالوا سبحانك لا علم لنا إلا ما علمتنا إنك أنت العليم الحكيم ...

( صدق الله العظيم )

وقال رسول الله صلى الله عليه وسلم

من أراد الدنيا فعليه بالعلم ومن أراد الآخرة فعليه بالعلم

ومن أراد الدنيا والآخرة فعليه بالعلم )

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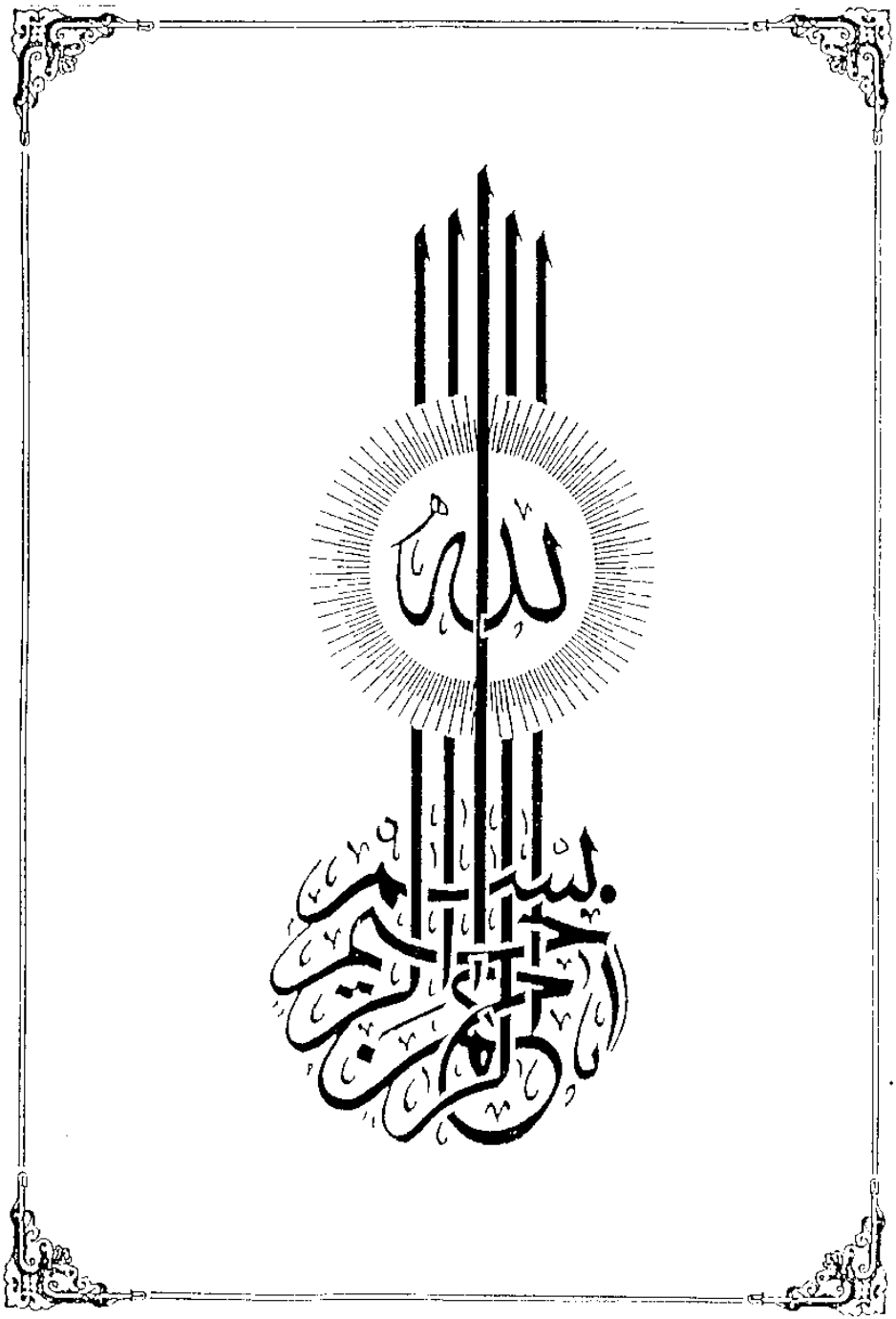

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CONTNTS

# INTRODUCTION

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Poliomyelitis is not a new disease, it is believed to have existed in ancient times. Description of the disease a flaccid paralysis of one or more limb, occuring in children without sensory impairment, often preceeded by a short febrile attack, and followed by increasing deformity appeared first in the medical literature of the late eighteenth and early nineteenth centries referring to cases developing in places as far apart as England, Italy and India (Underwood, 1789), Monteggia, (1813), Shaw, 1823). The pathology was described in 1856 by Duchenne, who correctly related the paralysis and wasting of the limbs to the "acute inflammatory atrophy of the ganglion cells in the anterior horns of the spinal cord," and observed that the initial attack could occur in adults as well as in children (Duchenne, 1855). Jacob Von Heine wrote a monograph on the disease in 1860,

Poliomyelitis is an infectious disease caused by an ultramicroscopic RNA virus with diameter of only 28 mu. In 1949 a tissue culture technique for cultivation of

poliomyelitis virus was developed (Enders et al.,1949) and progress in the study of the virus and their antibodies was greatly accelerated. Three sero types of poliomyelitis viruses have been distinguished; type I (Brunhilde), type II (Lansing) and type III (Leon). All three can produce the same pathological disease but each is distinguished by its distinct immunogenic character; infection with a strain of any one type stimulate in its host an immunity which protects against infection with further strains of the same type but not against strains of the other two types. The demonstration of these 3 types provided an essential piece of information for the understanding of the epidemiology of the disease (Committee on typing of the National Foundation for Infantile Paralysis, Immunologic Classification of Poliomyelitis Viruses, 1951). It showed immunologically that poliomyelitis is not one but three diseases and that to be immune to poliomyelitis an individual or a population must acquire not one but three separate immunities. A number of second but not of third attack of poliomyelitis have been reported in literature. Poliomyelitis occurs as an endemic and epidemic disease. The first report of an

epidemic of poliomyelitis appeared to be that of Bell, who wrote in 1831 of an epidemic which occurred in St. Helena among the children in the island about 3-5 years of age (Bell, 1836). In 1943 when Great Britain experienced her first epidemic with an incidence for England and Wales of 18 cases/ 100,000 population, Berlin reported an incidence of 72/100,000 population (Sabin, 1949). In 1952 Copenhagen, which had for many years with other parts of Scandinavia shown, a higher incidence than the rest of Europe: suffered its most severe epidemic with incidence of over 200 cases/100,000 population (Lassen, 1956). In 1948 a small isolated community of Eskimos suffered an epidemic which killed 5% and disabled 14% of total population and affected adults and children alike (Adams, 1949). Such epidemics, have spread steadily to more and more countries and in 1953 the World Health Organization referred to the tednency of the notification figures to rise in almost every country and spoke of the disease as an emenance of world-wide significance (W.H.O. 1953).

Safe Vaccination against poliomyelitis had started after the success of cultivation of viruses in tissue

culture by Enders et al., (1949). Two methods are being employed one which is associated with the name of Salk (1953, 1954), and consists of injecting a vaccine prepared from inactivated virus. The other method is associated with the name of Koproweski (1953, 1954) and Sabin (1966) and consisted of oral administration of attenuated poliovirus vaccine.

# REVIEW OF LITERATURE

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Poliomyelitis have been endemic in Egypt since ancient times (Van Rooyen and Morgan, 1943). Yet the disease was considered scarce in Egypt and reported cases were negligible. The apparent rarity of the disease especially at the first half of the 20th century in Egypt was mostly due to under reporting of cases in the acute stage and the relatively high mortality rate. Also infants and young children have the opportunity of comming in contact with poliovirus early in life so they either had the disease or acquired silent immunity at early age. This led to high immune population in which infants and young children that would be most susceptible had acquired immunity and hence epidemics were hearly unknown (Paul et al.,1952).

There were no definite data about the disease and its incidence in Egypt. Abdel-Khalik et al., (1954) studied the incidence of poliomyelitis in Egypt relying on data obtained from Mounira Hospital Cairo. They investigated cases at the physiotherapy department between (1939-1953) Table (1). In 1939 only 38 cases of infantile paralysis were refferred to the

Table I

Showing number of cases received between (1939 - 1953) at the physiotherapy dept. of the Children's Hospital, Moumira Cairo.

| Year | No. of Cases |
|---|---|
| 1938 | 38 |
| 1939 | 90 |
| 1940 | 65 |
| 1941 | 89 |
| 1942 | 71 |
| 1943 | 98 |
| 1944 | 119 |
| 1945 | 181 |
| 1946 | 246 |
| 1947 | 911 |
| 1948 | 234 |
| 1949 | 322 |
| 1950 | 413 |
| 1951 | 806 |
| 1952 | 880 |
| 1953 | 889 |

Abdel-Khalik et al.,(1954)

hospital, while in 1953, 889 cases were referred i.e. more than 23 folds increase. The authors mentioned that such a great rise in paralytic poliomyelitis was most probably associated with a parallel increase in non paralytic and abortive cases who were neither referred to physiotherapy department nor reported. Because of the lack of adequate laboratory investigations poliomyelitis is rarely diagnosed until paralysis is self-evident. Comparing the annual total number of patients with the annual total number of infantile parlytic cases, Abdel-Khalik et al. (1954) found that the increase in the latter was found to be out of proportion to the rise among the outpatients:

| Year | Outpatients | Polio cases | Incidence |
|---|---|---|---|
| 1939 | 263,038 | 38 | 14.45/100,000 |
| 1953 | 424,687 | 889 | 290.51/100,000 |

But Dewani and coworkers in 1959 found the total number of cases of poliomyelitis seen was 2,771 giving an incidence of 1313/100,000 outpatient attendance. They could not merely relate this increased incidence

to the increased awareness of the population but they referred that to a real increase in the incidence of poliomyelitis in Egypt.

Imam and Labib (1976) reported their observations on poliomyelitis in Egypt. They stated that the problem of the under reporting the cases was the main factor which led to the under estimation of poliomyelitis in Egypt. They showed that since 1970 there has been a sharp steady up rise in the number of the reported cases till 1974. The authors added that although acute paralytic poliomyelitis diminished in Egypt yet it is still of importance even after the application of compulsory vaccination since 1966.

Age Incidence

In Egypt poliomyelitis is still an infatile disease as the majority of cases are under two years of age. In their study about the incidence of the disease during the first two years of life Abdel-Khalik et al., (1954), showed that only two cases were encountered during the first month of life and that the incidence