OBSTETRIC PROFILE IN ASSOCIATION WITH TETANUS NEONATORUM

Thesis

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By

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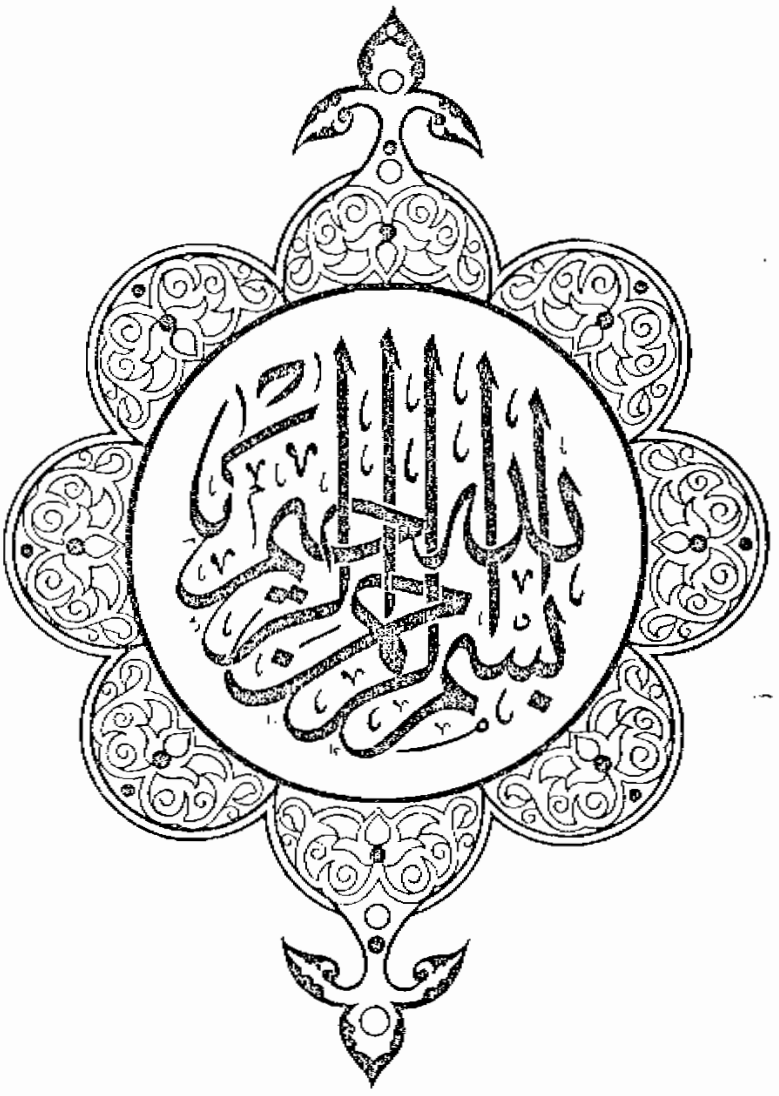

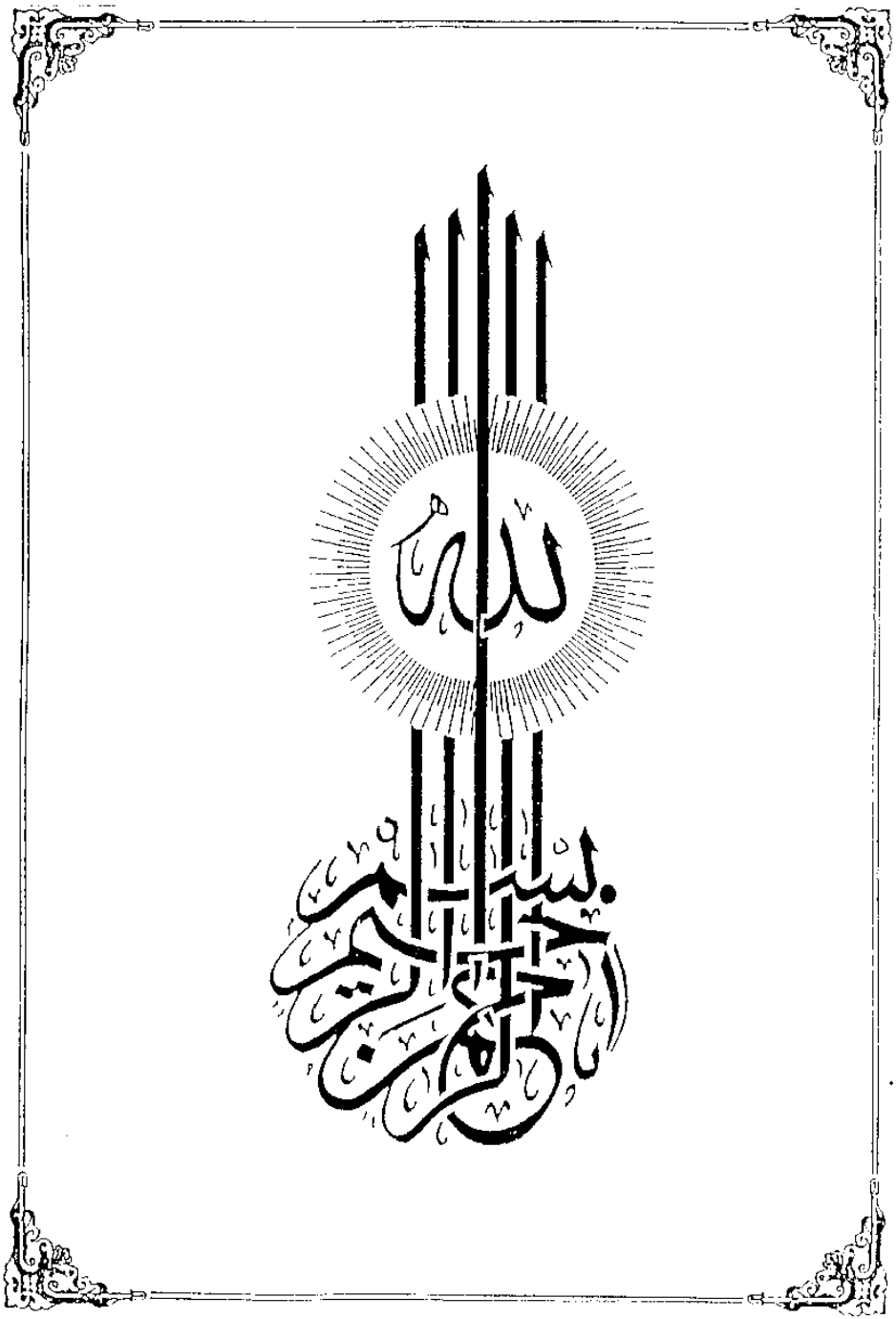

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Introduction & Aim Of The Work

INTRODUCTION

Neonatal tetanus, a preventable infection still kills many infants in developing countries.

Accurate assesstement of its incidence can be difficult because in traditional societies death in early infancy tend to go unrecorded. Approximately two-thirds of the world babies are born at home attended by indigenous mid-wives. (berggren et al 1981). The disease is chiefly a consequence of insanitary methods of handling the umblical stump during child birth and the principal sources of neonatal tetanus infection are the prevelant practice of applying substances like a cow - dung ash, ghee, powdered pipper, and traumatic to umblical cords and the use of unstrile instrument to cut them (Kakar et al 1978).

AIM OF THE WORK

1) To study different aspects of neontal tetanus from its bacteriological, epidemiological and

immunological aspects.

2) To study the obstetric profile of the delivery which might had contributed to the occurrence of tetanus neonatorum.

3) To discuss the prophylactic aspects of the disease.

Review Of Literature

CHAPTER I

BACTERIOLOGY OF CLOSTRIDIUM TETANI

General Characters of Closltridium Tetani:

1) **Historical Background:**

Clostridium Tetani was first described by Nicolaier in 1884. He found that inoculation of soil material into mice, guinea-pigs and rabbits was frequently followed by a disease closely simulating human tetanus. In animals dying of experimental tetanus, Nicolaier found tetanus bacilli only in the local lesion and suggested that the organism multiplied locally and produced a strychnine-like poison, which on absorption produced a disease.

Kitasato 1889 working in Berlin was the first to isolate clostridium tetani in pure culture.

This was accomplished by heating the pus to 80°C for 40-50 minutes to destroy non-sporing organisms, plating out in gelatin, and incubating in an atmosphere of hydrogen. With pure cultures obtained in this way he reporoduced the disease in animals. It was shown

early on that the bacillus itself was non invasive and non pathogenic, causing disease only when it multiplied in vegetative from and thereby released a toxin, which sometimes remained at the site of infection (local tetanus) but more often spread widely, causing the familiar generalized disease. Heat (65 - 70°C) destroyed the vegetative organisms and the toxin, but not the spores. Also treatment with various chemicals detoxified the toxin without destroying its antigenicity and thus produced "anatoxin" (toxoid), which is highly antigenic. As shown by Von Behring and Kitasato in 1890, repeated inoculation of small amounts of toxin produced anti-bodies that especifically neutralised the toxin, as later shown by Descombey (1924). This could also be asscomplished by large amounts of toxoid. Thus it has become possible to prepare not only antitoxin, which has been used for 90 years in emergency prophylaxis of the disease, but toxoid, which has revolutionized the problem of tetanus prevention and in some areas, where it has been extensively used has virtually eliminated the disease. Later Fildes in 1925a, deviced his technique of isolation of clostridium tetani from different samples in pure cultures using McIntoch and Fildes Jar.

2) **Morphological charaters:**

According to Fildes (1925a), the typical phase of the morphology of tetanus bacillus has earned the name "drum stick", the stalk representing the body of the bacillus and the spherical head the spore.

Vegetative form:

In non sporing condition, the organism, shows no characteristic features. In young culture, it is a gram-positive bacillus (Fildes 1925a and Willis 1960).

Size and Shape:

The individual bacilli vary in size from 4-8 u length and 0.4-0.8 u in breath, having a straight axis, parallel sides, and rounded ends. The bacilli are arranged singly and occasionally in chains.

Filamentous forms amounting to about 30 u in length are not uncommonly seen in swarming cultures on solid media. Some pleomorphism may occur in old culture (Fildes 1925a, and Willis 1960). Incubation at 37°C for at least 48 hours is required for cl. tetani to produce its fully developed terminal spores which give it the characteristic drum-stick appearance.

3) **Motility and Capsule:**

Cl. tetani are all actively motile and non capsulated (Smith et al 1975). The organism loses its motility on exposure to light used in examination. the motolity is due the presence of peritrichate flagellae. The flagellae are very numerous and are attached over the whole surface of the organism but not at the ends. (Kenthack and Connell 1897). the culture examined for motility should be very young (4 hours) and should be in a fluid medium. For domenstration of motility in anaerobes wet mount preparation are preferable to the hanging drop because free oxygen in a hanging drop preparation may inhibit the motility (smith and Holdman 1968).

4) **Cultural Characters:**

Clostridium tatani all grow easily but demand absolute anaerobisis, i.e. They are obligatory anaerobes (Smith et al 1975). They are most conveniently cultured at 37°C on blood Agar in the anaerobic atmosphere afforded by McIntoch and Fildes jar. There appear flat rather irregular colonies, and these may be surrounded by a zone of complete haemolysis (smith et al 1975). According to Macleod (1930) the maximum oxygen tention compatible with its free surface growth is less than 2 mm of mercury.

Fildes (1929b) found that not only does oxygen inhibit the growth of clostridium tetani but is also toxic to its vegetative cells, so that non sporing cultures of the organism are rapidly killed on exposure to air. The optimum temperature for growth is 37°C. The optimum pH is in the region of 7.3 (Dernby and Allander 1921 and Fildes 1929a).

Surface Growth:

Closltridium tetani grows well on ordinary nutrient media. The growth is improved by blood.

Isolated surface colonies are difficult to obltain, since growth tends to develop as a fine rhizoidal film, spreading over the surface of the medium swarming growth which is always more pronounced if the surface is moist, appears as an extremely fine, transleucent sheet, almost invisible with a fine irregular granular surface and a delicately filamentous advancing edge (Fildes, 1925a).

Robertson's meat medium, which consists of cooked meat suspended in infusion broth is useful in that it allows the growth of both anaerobes and aerobes. The