INCIDENCE AND FREQUENCY OF UREAPLASMA UREALYTICUM IN PREGNANT EGYPTIANS WITH ASYMPTOMATIC BACTERIURIA

By

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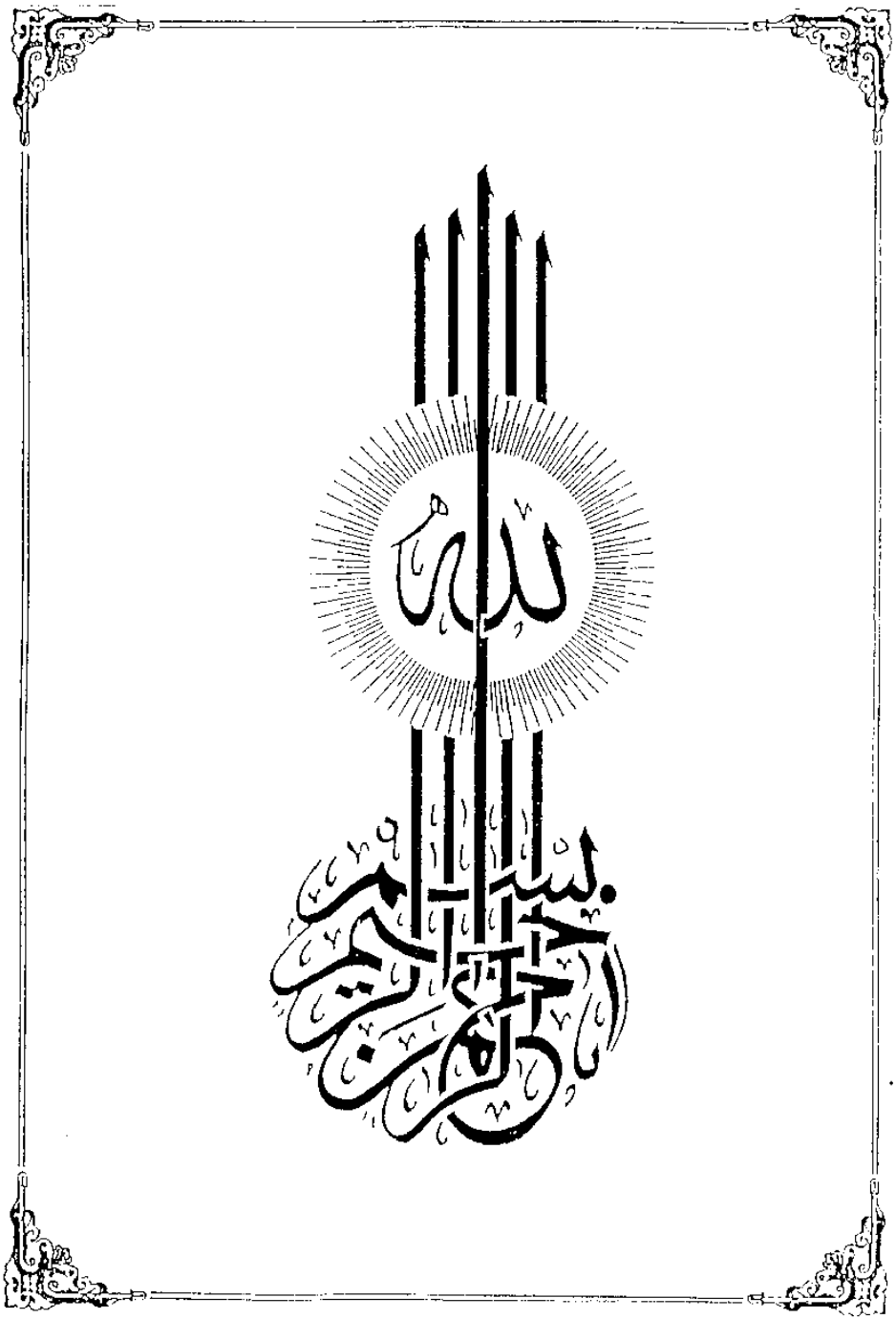

E R R A T A

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95	16	sodium	solid
98	last line	irone slides	iron tubes

CONTENTS

Introduction

INTRODUCTION

Asymptomatic bacteriuria can be defined as the presence of single species of bacteriuria in a count of 10^5 organisms/ml, or more in clean voided specimen of urine collected from a person with no symptoms referable to the urinary tract.

Bacteriuria is more common in females than in males except in the eldery. In women the incidence rises progressively with the age from about 2% in schoolgirls and 5-10% during the childbearing years to 20% in old age.

Studies of asymptomatic bacteriuria during pregnancy have shown an increasing incidence with increasing parity.

It's generally agreed that, if untreated, asymptomatic bacteriuria early in pregnancy is associated with a high risk (30-50%) of symptomatic acute urinary tract infection later in pregnancy or in the pueperium. It follows that detection of asymptomatic bacteriuria early in pregnancy will prevent about 90% of incidents of acute pyelonephritis during pregnancy.

Although E-coli is the commonest cause of urinary tract infection and for asymptomatic bacteriuria, however other types of organisms could be encountered e.g.indole negative proteus, stap.-saphrophyticus, other gram-negative rods, enterococci, etc. In addition, a variety of fastidious microaerophilic and anaerobic bacteria e.g. Ureaplasma urealyticum have been isolated.

Aim of the work

AIM OF THE WORK

The aim of this work is to study the incidence of presence of urinary Ureaplasma urealyticum among pregnant females with asymptomatic bacteriuria and to correlate this with the presence of other microbes present and with the parity.

Review of literature

MYCOPLASMAS

Bacteriology :

Mycoplasmas are unique group of organisms with the following characteristics :

1- The smallest reproductive units have a size of 125-250 nm.

2- They are highly pleomorphic because they lock a rigid cell wall and instead are bounded by a triple-layered "unit membrane" "plasma membrane" (Bredt et al, 1973).

3- They are completely resistant to penicillin but inhibited by tetracycline or erythromycin.

The lack of the cell wall and the rigid peptidoglycan polymer explains the resistance of the organisms to lysis by lysozyme as well as their susceptibility ro lysis osmotic shock and various agents causing the lysis of bacterial protoplasts (Razins 1978).

The mycoplasma membrane is a typical procaryotic plasma membrane built of amphipathic lipids (phospholipids, glycolipids, lipoglycans, sterols) and proteins.(Razin and Rottem 1976; Razin 1981).

Thin sections of mycoplasmas reveal that the cells are built of three organelles only, the cell membrane, the ribosomes and the characteristic procaryotic genome, definitely without mesosomes.(Razin et al 1980).

4- They can reproduce in cell-free media; on agar the center of the whole colony is characteristically embedded beneath the surface (fried egg appearance).(Razin and Oliver 1961)

5- Growth is inhibited by specific antibody.

6- Mycoplasmas don't revert to, or originate from bacterial parental forms.

7- Mycoplasmas have an affinity for cell membranes.(Razin et al 1983).

8- Usually non motile, but gliding motility have been demonstrated in some species (Bredt 1979). Fucultatively anaerobes possessing a truncated flavin-terminated electron transport chain devoid of quinones and cytochromes. An atmosphere of 25% N_2 + 5% CO_2 is preferred for primary isolation.(Noel R.et al 1985).

Gram negative. Catalase negative. Chemo-organotrophic, using their sugar and arganine as the major energy source. Requires cholesterol or related sterols for growth. Parasites and pathogens of a wide range of mammalian and avian hosts. Usually ferment carbohydrates or hydrolyse arginine or urea. Readly destroyed by heat. Don't give rise to inclusion bodies in tissues. G + C content of DNA mostly 23 - 41 moles % (Noel R.et al., 1985).

Morphology and identification :

Mycoplasma cannot be studied by usual bacteriologic methods because of small size of their colonies, the plasticity and delicacy of their individual cells (due to lack of rigid wall) and their poor staining with aniline dyes. The morphology appears different according to the method of examination. e.g.dark-field, immunofluorescence, Giemsa-

stained films from solid or liquid media, agar fixation.(Razin and Tully, 1983).

Growth or fluid media gives rise to many different forms, including rings, bacillary and spiral bodies, filaments and granules. Filamentous growth is usually associated with young logarithmic cultures growing under optimum conditions. However, filamentous phase is transitory and the filaments transform into chains of cocci which later break apart.(Bred et al.(1973). Phase-contrast or dark-field microscopy of young log-phase broth cultures is the recommended procedure for microscopic examination of mycoplasmas, as it introduces minimal distortions in the shape of the plastic cells. Moreover, it enables observation of gliding motility that characterizes Mycoplasmas. Examination of methanol-fixed organisms stained with Giemsa solution is preferrable to the Gram-stain.For electron microscope special attention should be paid to the osmolarity of the fixatives (Lemcke 1972) and the buffers (Cole et al.,1973), as these may drastically alter the actual size and the shape of the plastic organisms. Growth on solid media consists principally of plastic protoplasmic masses of definite shape that are easily distored. These structures varies in size from 50 to 300 mm in diameter.

Many strains of mycoplasmas grow in heart infusion peptone broth with 2% agar (pH 7.8) to which about 30% human ascitic fluid or animal serum (horse or rabbit) has added. Following incubation at 37^{o} C for 48-96 hours, there may be no turbidity, but Giemsa stains of the centrifuged sediment show the characteristic pleomorphic structures,

and subcultures on solid media yield minute colonies. After 2 - 6 days on special agar medium incubated in a Petri dish that has been sealed to prevent evaporation, isolated colonies measuring 20-500 μm can detected with a hand lens. These colonies are round with a granular surface and a dark center nipple typically burried in agar. They can be subcultured by cutting out a small square of agar containing one or more colonies and streaking of this material on a fresh plate or dropping it into liquid medium. The organisms can be stained for microscopic study by placing a similar square on a slide and covering the colony with a cover glass onto which an alcoholic solution methylene blue and azure has been poured and then evaporated (agar fixation) (Ernest Jawetz et al 1982). Such slides can also be stained with specific fluorescent antibody.

The study of reproduction of mycoplasmas at the level of molecular biology showed clearly that replication of their genome, which must precede cell division, follows the same pattern as with other procaryotes dividing by binary fission (Morowitz and Wallace 1973).

The mycoplasmas have limited biosynthetic abilities reflecting their small genome & parasitic mode of life. Consequently they require complex media for growth including the serum which provides fatty acids and cholesterol for membrane synthesis, which is unique, (Freundt et al 1980) in an assimilable, non toxic form.

Mycoplasma species are parasites of the mucous membranes and joints, Mycoplasma infection have been most frequently associated with

diseases of respiratory and urogenital tracts, where the parasites firmly adhere to and colonize the epithelial lining. The intimate association between the adhering mycoplasmas and their host cells provides an environment in which local concentrations of toxic by-products excreted by the organisms (i.e. H_2O_2, NH_3) can accumulate and cause tissue damage. (Razin 1978; Razin et al., 1983). Since no cell wall separates the plasma membrane of the parasite from that of its host, exchange of antigens may occur between the two membrane, an event which may trigger immunological responses of serious consequences to the host (Wise et al.,1978).

The intimate association between mycoplasmas and host cell membrans is reflected also by the "capping" of mycoplasma, adhering to lymphocytes, followed by shedding of membrane vesicles of presumed host origin (Stanbridge and Weiss, 1978).

This phenomenon is apparently related to the well-known induction of blast transformation by mycoplasmas (Naot 1982).

Growth characteristics :

Mycoplasmas are unique in microbiology because of :

1- Their extremely small size.

2- Their growth on complex but cell-free media.

Mycoplasmas pass through filters with 450 nm pore size and thus are comparable to chlamydiae or large viruses. However, parasitic mycoplasmas grow on cell free media that contain lipoprotein & sterol.