

Normal microbial flora in conjunctiva
in different age groups.

Thesis

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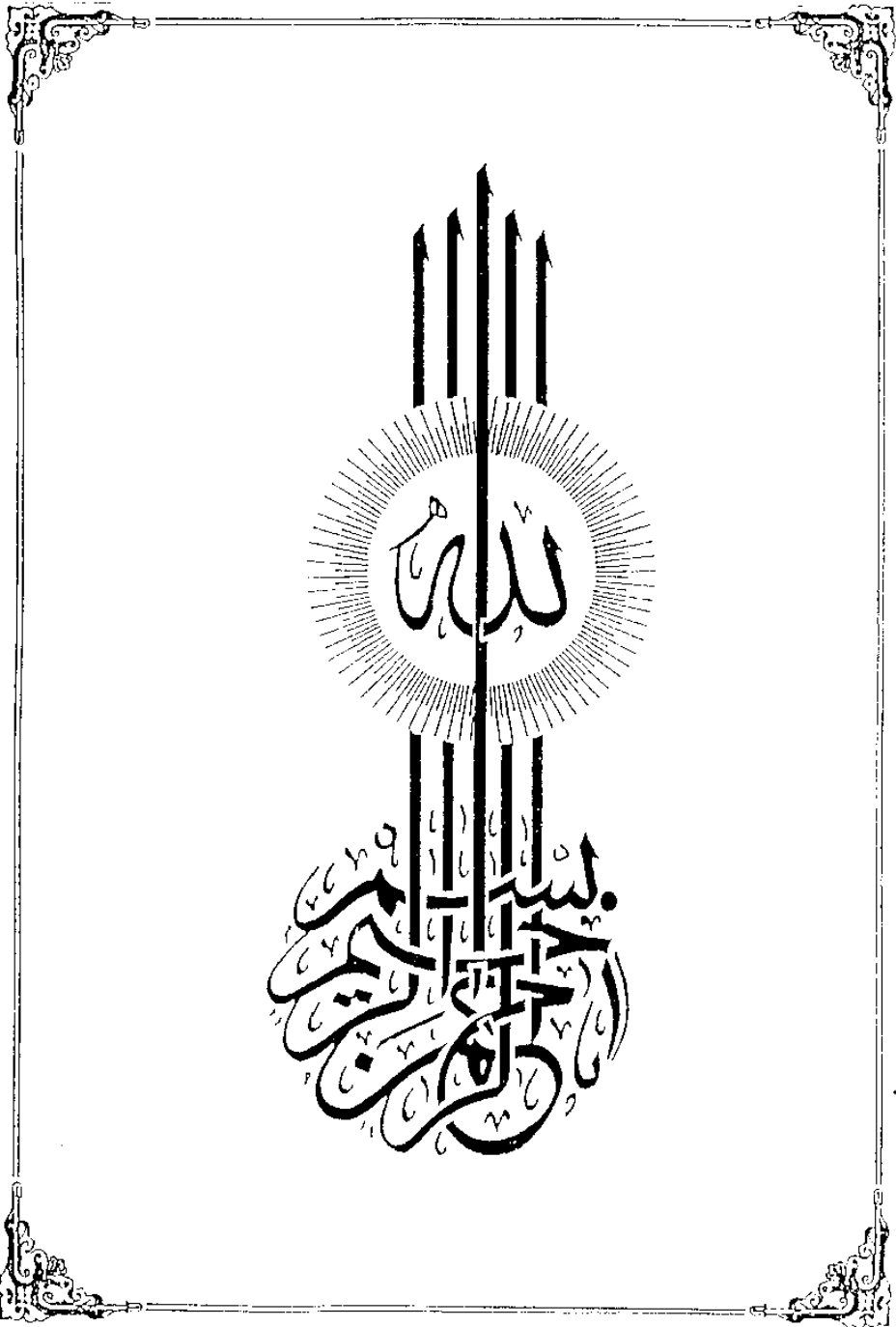
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microbial
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CONTENTS

	Page
I. AIM OF THE WORK	1
II. INTRODUCTION	2
III. REVIEW OF LITERATURE	
1. Normal flora of the conjunctiva	3
2. Types of the normal conjunctival flora	4
3. Source of the conjunctival flora	7
4. Factors affecting the normal conjunctival flora..	10
5. Prevalence of normal flora of conjunctiva in various areas	13
6. Effects of some agents on conjunctival flora ...	16
7. Microbial flora in immunodeficient patients	20
8. Role of normal flora in causing conjunctivitis..	21
9. Methods for culturing the conjunctival specimen.	24
10. Bacteriocines	25
11. Defense mechanisms of conjunctival sac	29
IV. MATERIALS & METHODS	33
V. RESULTS	36
VI. DISCUSSION	57
VII. SUMMARY	62
VIII. REFERENCES	63

INTRODUCTION

The skin and mucous membranes always harbour a
of microorganisms which can be arranged into two groups
(1) resident flora, consists of relatively fixed type
organisms regularly found in a given area at a given
(2) transient flora, consists of micro-organisms
which inhabit the skin and mucous membranes for diffe
rents of time ; it is derived from the environment, do
produce disease and does not establish itself permane
the surface .

It is to be noted that the conjunctiva, along w
respiratory, alimentary and genital tracts, form one
four mucosal portals for the entry of organisms into
as a whole. Thus the conjunctiva is an important rout
infection (Papp, 1956; Banks, 1958). A wide range of
is found in the normal conjunctival sac which vary in
number, their nature and their pathogenicity. The var
depend on several factors .

Normal flora of the conjunctiva changes in diff
groups e.g. Diphtheroids were found by Devorah and Ki
to increase in the normal conjunctiva with advance of
Khorazo (1972) isolated the pneumococci as normal flo
conjunctiva mainly in young group .

INTRODUCTION

AIM OF THE WORK

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The aim of this work is to study the normal conjunctival flora and the changes that occur in it in different age groups, particularly as we know that the aged are more liable to be operated upon due to eye troubles .

REVIEW OF LITERATURE

Normal Flora Of The Conjunctiva

Foote(1896) found that the normal conjunctival sacs were free of organisms in most cases , while Eyre(1897) stated that practically every conjunctiva exhibits some flora and found that bacteria could be isolated from lower fornix of the conjunctival sac while the upper fornix was free from bacteria.

Although Koblank(1896) stated that the conjunctival sac is normally sterile at birth, Skinner and Carr,(1974) stated that during the process of delivery the nose and the conjunctiva become contaminated from the genital passages of the mother. In both cases the conjunctiva afterwards tends to become contaminated by organisms either saprophytic or parasitic due to its exposure to the air and its continuity with the skin.

The facts that the sac may be sterile, and that organisms in it so frequently assume harmless characteristics, is due in part to its low temperature, in part to the action of the lysozyme of tears and in part to the mechanical action of blinking and the washing effect of lacrimal secretion, in addition to the exposure to ultra violet rays(Fleming and Allison,1922).

El-Gammal(1938) investigating the flora of the newly born during the first week of life found that the prevalent organisms were Staph.albus , C.xerosis and Pneumococcus; after that a variety of organisms were usually present e.g. E-coli , Morax-Axenfeld bacilli , Staph.aureus , fungus e.g. monilia. He stated that although these organisms were frequently commensal in conjunctival sac, most of them were potential pathogens.

Types of the normal conjunctival flora :-

The organisms recovered from the conjunctival sac are considered as normal flora when their cultures are obtained from persons who upon ophthalmic examination reveal no evidence of infectious process in their eyes (Cason and Winkler, 1954).

A wide range of organisms was found in the normal conjunctival sac which vary in their number, their nature and their pathogenicity. This variation is probably due to the locality where the investigations are carried out, the method of culturing and the type of the culture medium used (Lucic, 1927).

According to El-Gammal (1963) the normal conjunctival bacterial flora are divided into two groups:-

(1) The basic or constant flora: composed of *C. xerosis* and *Staph. albus*. Their number varies greatly with the general and personal hygiene of the subject and they can almost always be easily detected.

(2) The accidental or variable flora: composed of a very large variety of organisms. Their quantity and variety depend also upon the personal and general hygiene of the subject and on his surroundings.

In addition to the bacterial flora present in the conjunctival sac also normal fungal flora were present (Fazakas, 1953). These are airborne and their occurrence in conjunctival sac depends to a large extent on the occupation. Since many of these fungi live on plants and vegetable material, so they are preponderant in rural areas than towns. He isolated fungi from conjunctival sacs, lids and lacrimal passages in 83% of harvesters and thrashers in Japan. He found no difference between healthy and diseased eyes in isolation of fungi but Spinha and Das (1968) reported that the percentage of isolation of fungi from diseased eyes was higher than that of healthy ones and the percentage of positive cultures seems to depend greatly upon the type of disease involving the eye.

Mitsui and Hanabusa (1955) pointed out that the percentage of isolations of fungi increased after corticosteroid therapy.

Ando and Takatori (1982) found that, under ordinary conditions it may be difficult for a fungus to remain or proliferate in the conjunctival sac. The incidence of positive cultures was significantly higher in diseased eyes. Most positive cultures yielded only one ^{type of} colony and the same fungus was seldom cultured more than once from the same eye. They could isolate fungus from 6.6% of healthy conjunctivae while diseased conjunctivae yielded fungi in 17.4% of cases. These fungal flora vary considerably and although they are non-pathogenic, they are all potential pathogens, the most common are Blastomycetes (particularly yeasts and *Candida albicans*) and Hyphomycetes (particularly penicillium).

There is no evidence that viruses can be isolated from the normal conjunctival sac (Duke, 1965) .

Mc Natt et al (1978), worked on anaerobic flora of the normal conjunctiva. Specimens from the conjunctival sacs of 92 healthy eyes were cultured on two separate occasions to determine the presence or absence of a persistent anaerobic flora. Aerobic bacteria and fungi were also studied for comparison. Obligate anaerobes were recovered from 51.6% of the

cultures. *Propionibacterium acnes*, the predominant anaerobe encountered was present in 49.5% of the eyes. Some of the anaerobic cultures (60.9%) contained at least one micro-organism. Aerobic and facultatively anaerobic bacteria were present in 32.6% of the total eye cultures, being less common than obligate anaerobes; *Staph. epidermidis* was the most common. Fungi were rarely found. These findings suggest that the conjunctival sac is either sterile or normally contains small numbers of anaerobic, aerobic or facultatively anaerobic bacteria. As other workers (Gowen, 1935 and Khorazo, 1972) have suggested, the origin of the bacteria in the eye may be the skin of the eye lids.

Source of the conjunctival flora:

Axenfeld (1908) stated that the skin appears to be the commonest source of organisms which may be found on the conjunctiva.

It has been frequently noted that staphylococci are common inhabitants of the normal human conjunctiva (Pa, 1921; Pillat, 1922; McKee, 1924; Lucic, 1927; Kailty, 1930; Khorazo, 1935; Rodin, 1945; Duke, 1965; Nakhla et al, 1970; Fahmy et al, 1975; McNatt et al, 1978; Hovding, 1981, 1982). The predominating organism

is *Staph. albus*, the *citreus* and *aureus* strains occurring less frequently. The percentage of staphylococci as compared with the total normal flora recovered is reported to be 93-97% (Pillat, 1922 and Keilty, 1930), 60-67% (McKee, 1924 and Lucic, 1927), 94% (Duke, 1965), 72.5% (Nakhla et al, 1970) and 95.4% (Fahmy et al, 1975).

Keilty (1930) reported ^{that} the staphylococci isolated by him from the normal conjunctiva ~~was~~ a *Staphylococcus aureus*

and concluded that because the staphylococci from the nose also exhibit haemolysis, contamination of the conjunctiva most probably occurred ^T mechanically from the nose or through the naso-lacrimal duct.

The lower lashes are continually moist and there is a border of skin along the edge of the lower lid which is also moist. In those subjects having *Staph. aureus* or *citreus* on the skin around the eye, these strains can be recovered from the conjunctiva, those having only *Staph. albus* on the skin will also show the *albus* type in the conjunctiva. There is a relationship between conjunctival bacterial distribution and degree of activity of nictitation and this suggested a means of explaining the constant occurrence of staphylococci in the normal conjunctival sac. (Gowen, 1935). The fact that