

A COMPARATIVE STUDY OF THE CONJUCTIVAL BACTERIAL NORMAL FLORA IN PAEDIATRIC AND GERIATRIC SUBJECTS

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ABSTRACT

The conjunctival bacterial normal flora of twenty healthy paediatric and twenty healthy geriatric subjects were studied. Conjunctival swabs were collected from paediatric subjects aged 2months to 6years, and geriatric subjects aged 60years and above. The specimens were inoculated unto blood agar and incubated for 24-48 hour as the case may be. They were subsequently subjected to physical examinations using +20.00D magnifying lens; and biochemical tests using gram staining and coagulase test. Thirteen (32.5%) of the 40 samples yielded growth (3 paediatric and 10 geriatric samples). The total number of colonies was 37 in paediatric and 217 in geriatric samples. Staphylococcus epidermidis was the most predominant bacterial organism. The X^2 test showed significant ($P<0.05$) difference in the bacterial normal flora of paediatric and geriatric samples, both in presence of isolates and the number of colonies. The absence of growth in majority of the samples is because of the sterile nature of the normal conjunctiva. The effect of age on the conjunctival bacterial normal flora is further highlighted.

KEYWORDS: Bacterial normal flora, Conjunctiva, Paediatric subjects, Geriatric subjects, Staphylococcus.

INTRODUCTION

The internal organs of the normal human body like brain among others with exception of the gastrointestinal tract are normally free of microorganism. However, the surfaces of the body which are in contact with the environment like the skin and mucous membranes rapidly become colonized by organisms present in the environment¹.

The conjunctiva as a mucus membrane sustains permanent flora of indigenous bacteria. A variety of organisms may be cultivated from the normal conjunctiva, but the number of organisms is usually small. The conjunctiva is kept moist and healthy by the continuous secretions from the lacrimal glands. Blinking wipes the conjunctiva every few seconds, mechanically washing away foreign matters including bacteria. Tears also contain bactericidal substances including lysozyme. The primary microbial organisms retrieved from normal uninfected conjunctiva are staphylococcus epidermidis, and certain corynebacterium species, staphylococcus aureus, some streptococci; Haemophilus species and Neisseria species are occasionally found^{2,3}. The range of these microorganisms, however, varies in different individuals due to variations in genetic

make-up, age, nutrition, race and sex^{2,4}.

This highlights the objective of this study, which is the effect of age on the conjunctival normal flora. It is important to note here that these indigenous bacteria may become opportunistic, that is, become pathogenic, if suitable opportunity arise. The establishment, therefore, of the indigenous bacteria in these major age groups would guide the eye care practitioner in appropriate drug prescription.

MATERIALS AND METHODS

The study populations were 20 healthy paediatric subjects aged 2month to 6 years, and 20 healthy geriatric subjects aged 60years and above. These subjects were adjudged healthy (free of systemic and ocular disorders and drug intake two weeks prior to study) after carrying out some preliminary test.

Conjunctival swabs were collected from the lower palpebral conjunctiva of the right eye of the subjects. The samples were taken to the laboratory for culturing and identification. The culture medium used was blood agar. The specimens from the swab sticks were used to make a smear on the culture plates (primary inoculum) and incubated aerobically at 37°C for 24 hours. A secondary

inoculum of cultures that had no growth within 24hours was made and re-incubated for another 24hours.

The growths on the culture plates were identified after 24-48 hours using physical examinations (morphological characteristics and colony count with the help of a +20.00D magnifying lens), and biochemical tests (Gram staining and coagulase test) according to Baker et al⁵.

The chi-square (X^2) test at the 0.05 level of significance was used to test for statistical independence of the 2 group of enumerative data (counts and frequencies).

RESULTS

The presence of isolates and the quantity (number of colonies) of isolates are shown in tables 1 and 2 respectively.

Out of the 40 samples, 13 cultures yielded growth (3 paediatric samples and 10 geriatric samples) as shown in table 1. The total number was of colonies 37 in the paediatric samples and 217 in the geriatric samples (table 2).

The data when subjected to statistical analysis using X^2 test at the 0.05 level of significance showed significant difference in the conjunctival bacterial normal flora of the paediatric and geriatric samples both in the presence of isolates and number of colonies ($X^2_{cal9.27} > X^2_{tab7.82}$ and $X^2_{cal149.45} > X^2_{tab7.82}$ respectively).

DISCUSSION

Thirteen (32.5%) of the 40 samples cultured yielded growth, 3(7.50%) were paediatric and 10(25.00%) were geriatric. The absence of growth in majority of the cultured samples (67.5%) has also been documented by other authors^{2,3,6,7,8,9,10}. This is because the conjunctival sac is either sterile or normally contains small numbers of aerobic,

anaerobic, or facultative bacteria; which also explains the small quantities of isolates found even where growth was recorded.

The bacterial organisms isolated in order of dominance were staphylococcus epidermidis, staphylococcus aureus, Bacillus spp, and actinomycetes spp. Each sample yielded one type of microorganisms, in other words no two types of microorganisms were found on one sample. A similar study carried out by McNatt et al¹⁰, also isolated one type of microorganism from each of the samples that yielded growth. This is explained by the fact that the local defense of the eye continues to be intact thereby preventing the fixation of invading microorganism.

Staphylococcus epidermidis has the highest frequency of occurrence, which is in consonance with studies by other researchers.

A significant difference was observed in the number of species and the number of colonies of each specie of the conjunctival bacterial normal flora in paediatric and geriatric samples. This agrees with what was reported by Singer et al¹³, that adults showed a greater number and quantity (population) of species per eye than did younger subjects.

Actinomycetes spp, was isolated in the paediatric sample, though in very small quantity this suggests that actinomycetes, which is normally present in the pharynx and mouth, could also be part of the conjunctival normal flora, probably because of children's poor habit of moving their hands from the mouth to the eye.

The geriatrics would be more prone to opportunistic infections of the conjunctiva since they showed more types and quantity of microorganisms in their conjunctiva samples. It is therefore reiterated that geriatric subjects should visit the eye care practitioners more routinely.

TABLE 1: NUMBER (PRESENCE) OF ISOLATES

Sample	<i>Staph. aureus</i>	<i>Staph. epidermidis</i>	Bacillus spp.	Actinomycetes spp	Total
Paediatric Sample	0	0	2	1	3(7.50%)
Geriatric Samples	4	5	1	0	10(25.00%)
Total	4	5	3	1	13(32.50%)

TABLE 2: QUANTITY (NUMBER OF COLONIES) OF ISOLATES

Samples	<i>Staph aureus</i>	<i>Staph epidermidis</i>	Bacillus spp.	Actinomycetes spp	Total
Paediatric Samples	0	0	27	10	37
Geriatrics Samples	96	96	25	0	217
Total	96	96	52	10	254

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