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BACTERIAL CONJUNCTIVITIS IN ZAHEDAN

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ABSTRACT

The objective of this study was to determine the most common type of pathogen causing conjunctivitis. Out of 495 patients who referred to the Zahedan Eye Clinic from May 22, 1991 to October 22, 1992, 296 cases were diagnosed as nonbacterial conjunctivitis. From the remaining number of cases, two patients had chlamydia and six patients had *Candida albicans*, while the frequency of bacterial infection was as follows: *N. gonorrhoeae* 7 patients, *Hemophilus aegyptius* in 11 patients, *Moraxella lacunata* in 6 patients, *Streptococcus pneumoniae* in 57 patients, *E. coli* in 5 patients, *Staphylococcus aureus* in 5 patients, *Proteus mirabilis* in 5 patients, *Pseudomonas aeruginosa* in 8 patients, *Gardnerella vaginalis* in 4 patients, and providencia species in one patient. Bacterial agents were isolated by Gram staining and culturing. In conclusion our results show that the most common cause of conjunctivitis is nonbacterial, but the most common cause of bacterial conjunctivitis is *S. pneumoniae*. Furthermore, our incidence of chlamydia and *N. gonorrhoeae* was also more than that in the literature.

Keywords: Bacterial conjunctivitis, conjunctivitis, ophthalmia neonatorum.

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INTRODUCTION

Conjunctivitis is an inflammation of the conjunctiva characterized by cellular infiltration and exudation. Classification is not satisfactory but is often based on the cause, the age of occurrence, the type of exudate, or clinical course.[1] The conjunctiva and its adnexa are usually sterile at birth but are rapidly colonized by saprophytic bacteria. Once established, the normal flora develops a lifelong relationship with the host in a stable balance between bacterial proliferation and inhibition by indigenous antibacterial factors.

Unless this steady state is disrupted, the result is a quiet, healthy mucous membrane surface in which both bacteria and host co-exist with certain mutual advantages. For the host, the normal flora provides protection against colonization by organisms of greater virulence and pathogenic potential, thereby becoming part of the eye's defense against infection.[2] *Staphylococcus epidermidis* and diphtheroids predominate among the flora isolated from healthy eyes, although species of greater virulence such as *S. aureus, Streptococcus pneumoniae, Pseudomonas aeruginosa*, and even meningococci have been reported.[3,4]

It has been suggested that these more virulent species of bacteria are primarily present transiently, and their presence does not represent true colonization of the eye. Even transient presence however represents a source of serious infection, which is especially important in children.[5,6]

Bacterial conjunctivitis is a common form of ocular infection which involves all ages and is worldwide in occurrence. It is caused by the introduction of a wide spectrum of exogenous microorganisms, each possessing certain pathogenic features that in turn influence the clinical findings and course of the infection.[7]

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MATERIALS AND METHODS

495 patients referred to Zahedan Eye Clinic from May 1991 to October 1992. Microbiology studies of the eyes in patients with conjunctivitis are of limited utility in establishing the etiological diagnosis in many cases. However in contrast to conjunctivitis, prompt laboratory investigation is mandatory in the management of bacterial corneal ulcer. In our study, specimens were collected from the patients by the consultant ophthalmologists or residents with surgical instruments or Dacron-tipped swabs before starting antibiotic therapy.[8]

Direct examination: Gram staining (Hucker's modification) shows pus cells, intra- and extracellular bean-shaped diplococci and other sources of bacteria.[9] Wright Giemsa staining gives good information to the ophthalmologist, e.g. intracytoplasmic inclusion bodies and allergy (with eosinophils).

Swabs, glass microscopic slides, an alcoholic lamp or gas burner, staining material and different culture media including blood agar, chocolate agar, Thayer-Martin modified (gonococcus), thioglycolate medium (anerobic and facultative anaerobic bacteria), Sabouraud dextrose agar (fungi), and Lowenstein-Gensen (*M. tuberculosis*) were used.

Samples obtained were inoculated on the above-mentioned media. After identification of etiological agents, testing was done by disk diffusion method of Kirby-Bauer.[10]

RESULTS

In this study, we had 495 patients. Fifty-one percent were male and forty-nine percent female. The incidence of nonbacterial conjunctivitis (vernal, viral, allergic cases) was 59.8%, bacterial conjunctivitis 22%, inclusion conjunctivitis 17.9%, and fungal conjunctivitis 1.2%. 199 patients had bacterial conjunctivitis. Our findings show that the microbial pathogen causing bacterial infection was *N. gonorrhoeae* in seven patients (6.4%), *H. aegyptius* in 11 patients (10%), *Moraxella lacunata* in six patients (5.5%), *S. pneumoniae* in 57 patients (52.2%), *E. coli* in five patients (4.5%), *Staphylococcus aureus* in five patients (4.5%), *Proteus mirabilis* in five patients (4.5%), *Pseudomonas aeruginosa* in eight patients (7.3%), *Gardnerella vaginalis* in four patients (3.6%) and providencia in one patient (0.9%) (Table I).

56 patients were under one year old (51%), 22 patients between 1-9 years (20%), seven between 10-19 years (6%), four between 20-29 years (4%), four between 30-39 years (4%), two between 40-49 years (2%), two between 50-59 years (2%) and 12 patients were over 60 years old (11%) (Table II).

Table I. Etiological agents in bacterial conjunctivitis.

Etiological Agent	Cases	%
S. pneumoniae	57	52.2
H. aegyptius	11	10
P. aeruginosa	8	7.3
N.gonorrhoeae	7	6.4
M. lacunata	6	5.5
E. coli	5	4.5
S. aureus	5	4.5
Prot. mirabilis	5	4.5
G. vaginalis	4	3.6
Providencia sp.	1	0.9

Table II. Age distribution of patients.

Cases	Age grouping (in year)	%
56	<1	51
22	1-9	20
7	10-19	6
4	20-29	4
4	30-39	4
2	40-49	2
2	50-59	2
12	>60	11

All of the patients with *Neisseria gonorrhoeae* were neonates and had mild conjunctivitis with purulent discharge without corneal involvement and their first eye examination had been 3 weeks after birth. In the 57 patients with *S. pneumoniae* infection, 24 patients (42.1%) were under 1 year, 12 patients (21%) were between 1-9 years, seven (12.2%) between 10-29 years, three (5.2%) between 30-49 years, and 11 patients (19.2%) were above 50 years old.

In patients with inclusion conjunctivitis, 54 patients (64.3%) were male and 30 patients (35.7%) female. 20 patients (23.8%) were below 9 years old, 30 (35.7%) between 10-19 years, 19 (22.6%) between 20-29 years, 12 (14.2%) between 30-39 years, and three patients (3.5%) were between 40-49 years old.

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Table III. Incidence of etiological agents in conjunctivitis.

Causative Agent	Patients	%
S. pneumoniae	23	37.1
N. gonorrhoeae	7	11.1
Candida albicans	6	9.7
P. aeruginosa	5	8.1
E. coli	5	8.1
Gard. vaginalis	5	8.1
Mor. lacunata	3	4.8
H. aegyptius	2	3.2
S. aureus	2	3.2
P. mirabilis	2	3.2
chlamydia	2	3.2
providencia	1	1.6

All six of the patients with fungal conjunctivitis were neonates. Three patients were male and three were female. The total number of patients with bacterial, fungal, and inclusion conjunctivitis was 199 patients. We had 62 patients (31%) in the newborn period (first 28 days of life) in this group. In order of incidence, the most common etiology was *Streptococcus pneumoniae,* 37.1% (23 patients), *N. gonorrhoeae* with 11.3% (7 patients), fungal conjunctivitis (*C. albicans*) (9.7%) (6patients), *Pseudomonas aeruginosa, E. coli* and *Gardnerella vaginalis,* 8.1% (5 patients), *Moraxella lacunata,* 4.8% (3 patients), *H. aegyptius, S. aureus, P. mirabilis* and chlamydia 3.2% (2 patients), and providencia in one patient.

DISCUSSION

Acute bacterial conjunctivitis is usually caused by *Staphylococcus aureus, Streptococcus pneumoniae, Haemophilus influenzae,* or a combination of these organisms.[11,12] Acute bacterial conjunctivitis tends to occur more frequently in children and young adults.[13]

Bacteria from the maternal genital tract or from the environment can be inoculated onto the conjunctiva during or after birth. Bacterial conjunctivitis is caused by *Neisseria gonorrhoeae, Staphylococcus aureus, Haemophilus spp., Streptococcus pneumoniae,* enterococci, *Pseudomonas aeruginosa* and *Chlamydia trachomatis.* The incubation period for gonococcal conjunctivitis is several days. Symptoms usually begin on day 3 to 5 of life and may progress rapidly. In the classic case, the conjunctiva is edematous, hyperemic and covered with pus. Care should be taken in examining the eyes as the exudate is full of bacteria and may spurt forth from the lids. Infants with gonococcal conjunctivitis are at risk for corneal ulceration and perforation and subsequent visual impairment.[14,15] The current incidence of neonatal infection is 0.6%.[16,17]

Inclusion conjunctivitis is an acute ocular inflammation caused by *Chlamydia trachomatis.* Newborn infants are infected in the birth canal and develop an acute mucopurulent conjunctivitis after an incubation period of 4 to 14 days. Adult inclusion conjunctivitis is transmitted venerally and by contaminated eye cosmetics. About 90% of adult women who have chlamydial eye infection have an associated chlamydial genital infection.

In this study the most common cause of bacterial infection was *Streptococcus pneumoniae.* The incidence of neonatal conjunctivitis with *N. gonorrhoeae* and *C. albicans* was also very high.

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