



## MICROBIAL STUDY OF CONJUNCTIVITIS IN IRAQI PATIENTS

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### Abstract

This study included 237 patients with purulent conjunctivitis who were referred to the out - patient clinical of Ibn- Al- Haitham eye Teaching Hospital and Medical City teaching hospital (Baghdad). During the period of 1<sup>st</sup> September 2009 to 31<sup>st</sup> August 2011, their ages ranged from 3 months to 82 years. The result showed that 204 (86.07%) patients had positive results using direct examination by Gram's stain and 184 (77.54%) patients had positive results by using culture method technique. No fungal infections were recorded in this study. Gram positive coccid were the most common causative agents of purulent conjunctivitis, (36.4%) *Staphylococcus epidermidis* followed by *Staphylococcus aureus* (28.8%), *Pseudomonas aeruginosa* (9.5%), *Haemophilus influenza* (6.75%), *Corynebacterium diphtheria* (6%), *Streptococcus pneumonia* and Alpha hemolytic streptococcus (5.4% for each), *Moraxella lacunata*. (4%), *Moraxella catarrhalis* is (3.4%), *E. coli* (2%) and *Shigella* (0.7%). The results generally showed that the most effective drug was Ciprofloxacin, followed by Cefotaxime, Vancomycine, and Rifampin. The least effective drugs were Ampicillin, Tetracycline and Erythromycin, this being related to the laboratory results of culture and sensitivity.

**Keyword:** Microbial study, Bacterial conjunctivitis, Iraqi patients.

### Introduction

Conjunctivitis is a nonspecific term used to describe an inflammation of the conjunctiva (ophthalmic), caused by a wide range of conditions. It is commonly referred as one of the causes of "red eye" or "pink eye". It is the most common eye disease worldwide, in distribution affecting all ages, races, social strata, and both genders (Christopher and Quinn, 2008). It varies in severity from a mild hyperemia with tearing, to a severe conjunctivitis with copious purulent discharge (Schwab *et al.*, 1995). Most cases of infectious conjunctivitis are sporadic or related to epidemic outbreak. No specific risk factors for its development are ill defined and related to underlying etiology. Conjunctivitis has been reported as the initial manifestation, which will ultimately lead to fatal systemic infection (Felman *et al.*, 2002). Patients who have undergone glaucoma-filtering surgery with formation of a conjunctiva bleb have increased risk of developing endophthalmitis as a result of bacterial conjunctivitis. Inadequately treated, gonococci conjunctivitis may progress, resulting in keratitis, endophthalmitis, and blindness. Most common bacterial pathogens can cause conjunctivitis are:- *Staphylococcus* species, hemophilic species, *Streptococcus pneumonia*, and *Moraxella* species. *Streptococcal* and Hemophilic infections occur more frequently in children (Duke-Elder, 2005).

This work was carried out to investigate the role and etiological agents which cause acute purulent conjunctivitis in Iraqi patients with evaluation the susceptibility of the isolated bacteria to antibiotics.

### Materials and Methods

Total 237 patients were included in this study, they were suffering from purulent conjunctivitis. The above patients attended the out patients clinical of Ibn- Al-Haitham teaching eye hospital, and medical city teaching hospital, during September 1999, until August 2001.

The clinical diagnosis was done by senior call in that day and the possible etiologies of infections of the conjunctiva were determined.

All cases were thoroughly studied from bacteriological and mycological aspects. Each case was carefully assessed regarding isolation and identification of the causative agents whether they are bacterial or fungal.

### Specimen's collections

Conjunctiva swab taken from patients with purulent conjunctivitis. All the samples were subjected to laboratory investigation. All samples were inoculated on blood, macconkey and chocolate agar at 37C for 48-96 hrs. Incubation. While on Sabouraud's glucose agar plates, incubation at room temp, for 7-14 day. (Finegold and baron, 1986; Jawetz *et al* 1987) Lacto phenol cotton blue stain was performed to exclude any fungal filaments.

### Bacterial identification:

Identification of bacteria was done according to the method described by Jawetz *et al* (1987). Fungi were identified according to the method described by Emnos *et al* (1974).

### Antimicrobial susceptibility test:

Antimicrobial susceptibility test of the isolated microorganisms were performed by using the Baur- Kirby disc diffusion method (Baur *et al*, 1966).

### Results

A total of 237 patients with acute purulent conjunctivitis were included in this study. Higher incidence was recorded among male 141 (59.49%) than female 96 (40.50%). (Table 1). The distribution of the occupations was as follows: 51 employees, 35 housewives, 25 students, 12 breadwinner, 12 teachers, 7 retired and 5 workers.

### Laboratory findings:

In this study, microorganisms species were demonstrated from 204 (86.07%) patients eyes by using Gram's stain technique, while 184 (77.64%) species were isolated by using culture methods. Both Gram's stain and culture methods detected microorganisms from 174 (73.41%) patients sample (Table 2).

In the child age group, microorganisms species were isolated from 64 children, 18 (28.1%) were infected by *Staphylococcus epidermidis*, 15(23.4%) *Staphylococcus aureus*. 9(15.62%) *Hemophilic influenza*, 9(14.0%) *Streptococcus* spp. 6 (9.4%) *Streptococcus pneumonia*, 3 (4.68%) Alpha hemolytic *Streptococcus*, 5 (7.81%) *Moraxella lacunata*, *Moraxella catarrhalis* and *Pseudomonas aeruginosa* were isolated in the same

percentage 4 (6.25%) table (3).

Table (4) showed the microorganism, which isolated from adult age group. *Staphylococcus epidermidis* showed higher percentage 49 (40.8%), followed by *Staphylococcus aureus* 38 (31.67%) patients, *Pseudomonas aeruginosa* 10 (8.33%) patients, *Corynebacterium diphtheria* 9 (7.5%) patients, Alpha hemolytic *Streptococcus* 5(4.17%) patients, *E. coli* 2 (2.5%) patients, *Streptococcus pneumonia* 2(2.5%) patients, and each of *Moraxella lacunata*, *Moraxella catarrhalis*, *Shigella* was isolated from only single patients.

Bacterial isolate showed them sensitivity to antibiotic used in this study the most effective drug was ciprofloxacin followed by Cefotaxime followed by Vancomycine and Rifampin.

**Table 1 :** Percentage of microorganisms species demonstrated in 237 patients with acute purulent conjunctivitis in relation to sex

R	LAB.	Female		Male	
	Result	Direct	Culture	Direct	Culture
1.	Positive	83 (86%)	78 (81.3%)	121 (86%)	106 (75%)
2.	Negative	13 (14%)	18 (18.2%)	20 (14%)	35 (25%)
Total		96	96	141	141

**Table 2 :** Microorganisms species detected by direct examination and culture method in 237 patients

	Causative agents	Direct Exam*.	Culture**
1.	Alpha hemolytic streptococcus	8	8 (5.4%)
2.	<i>Corynebacterium diphtheriae</i>	9	9 (6%)
3.	<i>E. coli</i>	2	3 (2%)
4.	<i>Haemophilus influenzae</i>	7	10 (6.8%)
5.	<i>Moraxella lacunata</i>	3	6 (4%)
6.	<i>Moraxella catarrhalis</i>	5	5 (3.4%)
7.	<i>Pseudomonas aeruginosa</i>	11	14 (9.5%)
8.	<i>Staphylococcus (Spp.)***</i>	146	120 (65.2%)
9.			
10.	<i>Shigella</i>	1	1 (0.7%)
11.	<i>Streptococcus pneumoniae</i>	8	8 (5.4%)
12.	No growth	4	53 (22.4%)
total		204 = 86.07%	237 184 +ve

\* Results obtained by direct examination by Gram's stain.

\*\* Results obtained by culture method examination.

\*\*\* (Spp.) includes (*Staphylococcus aureus* + *Staphylococcus epidermidis*)

**Table 3 :** Microorganisms species were isolated from 90 children with acute purulent conjunctivitis (culture method)

a	Causative agents	NO	... % '
1.	<i>Alpha hemolytic streptococcus</i>	3	4.68
2.	<i>Corynebacterium diphtheria</i>	0	0
3.	<i>E. coli</i>	0	0
4.	<i>Haemophilus influenza</i>	9	15.62
5.	<i>Moraxella lacunata</i>	5	7.81
6.	<i>Moraxella catarrhalis</i>	4	6.25
7.	<i>Pseudomonas aeruginosa</i>	4	6.25
8.	<i>Staphylococcus aureus</i>	15	23.4
9.	<i>Staphylococcus epidermidis</i>	18	28.1
10.	<i>Shigella</i>	0	0
11.	<i>Streptococcus pneumonia</i>	6	9.4
total		64	100%

**Table 4 :** Microorganisms species were isolated from 120 adult patients with acute purulent conjunctivitis (culture method).

N	causative agents	NO	%
1.	<i>Alpha hemolytic streptococcus</i>	5	4.17
2.	<i>Corynebacterium diphtheriae</i>	9	7.5
3.	<i>E. coli</i>	3	2.5
4.	<i>Haemophilus influenza</i>	1	0.83
5.	<i>Moraxella lacunata</i>	1	0.83
6.	<i>Moraxella catarrhalis</i>	1	0.83
7.	<i>Pseudomonas aeruginosa</i>	10	8.33
8.	<i>Staphylococcus aureus</i>	38	31.67
9.	<i>Staphylococcus epidermidis</i>	49	40.8
10.	<i>Shigella</i>	1	0.83
11.	<i>Streptococcus pneumonia</i>	2	1.67
total		12	(100%)

## Discussion

Microbial conjunctivitis is a common ocular infection , it is an inflammatory reaction of the conjunctiva after exposure to certain pathogenic bacteria, more frequently treated by the primary care physician (or general practitioner), and is therefore a condition not often seen by ophthalmologist (Mark, 1995). In this study the range of age was three months to eighty two years old, mean age (38.8 year) this is comparable with results of Mahajan, (1983). The main complaints of the patients were red eye, foreign body sensation pain in addition to discharge. These finding are comparable to presentation of patients included in the study of Abelson *et al.* (2008), but the severity and duration were different because of variable health awareness and the socio-economic state among different communities. The laboratory result showed, that (86.07%) patient's samples were positive by using direct examination Gram's stain and (77.54%) were positive result obtained by culture method. These results are compatible to that reported by Stenson *et al.* (1982), who found (80%). Other studies Dewan *et al.* (1992) and Cevenkel and Globocnik, (1997), were obtained (100%) positive result by both (direct and culture) methods. This study showed that 10 (4.5%) of the patients sample were positive by using culture method and negative by Gram's stain technique. This might be due to presence of normal microbial flora, or few microorganisms taken in the sample for direct examination. While Stenson, *et al.* (1982), found (15%). In this study, (22.36%) of the samples were negative by using culture method, it might be due to a non-bacterial infection of the conjunctiva especially when we know that the various forms of conjunctivitis are often not associated with pathognomonic features. Papa *et al.*, (2002), who consider these results as viral infections. While Chisari *et al.* (2003) and Rietveld *et al.* (2005), they consider the negative result as a noninfectious conjunctivitis.

In this study different microorganisms species were isolated from (81.6%) the adult group. This result is comparable to the result obtained by Papa *et al.* (2002), but higher percentages (47%) was reported by Mahajan, (1983). This variation in the results of microorganisms isolated in different studies is probably due to seasonal variation. For examples, homophiles species is more often found in warmer climates in young children. Mark *et al.* (1995), reported that the isolation rate of conjunctiva infections due to *Staphylococcus* spp. is not affected by any seasonal variation or climates.

The common microorganisms isolated from adult group in this study were 49 (40.8%) *Staphylococcus epidermidis*, followed by 38 (31.67%) *Staphylococcus aureus*, 10(8.33%) *Pseudomonas aeruginosa*, 9 (7.5%) *Corynebacterium diphtheriae*, 5 (4.17%) *Alpha hemolytic streptococcus*, 3 (2.5%) *E. coli*, 2 (1.67%) *Streptococcus pneumonia*, 1(0.83% for each) *Moraxella lacunata*, *Moraxella catarrhalis* and *Shigella*. These results are compatible to the result obtained by Rose, (2007), whom found that the percent of *Staphylococcus epidermidis* isolated was higher than *Staphylococcus aureus* and others microorganisms. While Papa *et al.*, (2002), whom they reviewed that the percentage of *Staphylococcus aureus* (57%) and *Staphylococcus epidermidis* (37%), and Mahajan, (1983), *Staphylococcus aureus* (36%), and (16%) for *Staphylococcus epidermidis*,

In this study *Moraxella catarrhalis* was isolated from 5(3.4%) patients. This microorganisms was isolated for the first time in Iraqi patients, for this reason this part need more study and investigation to found the relationship or role of this microorganisms in eye infections.

## Conclusions

From our work we conclude that:

1. In this study, for the first time in Iraq, *Moraxella catarrhalis* was isolated from patients with acute purulent conjunctivitis.
2. Presence of *Staphylococcus epidermidis*, and *Staphylococcus aureus* which are considered as a normal microbial flora suggest that bacterial conjunctivitis was due to one or more of the defense mechanisms being broken down.
3. Laboratory studies especially direct examination by Gram's stain is important and effective method for diagnosis of acute conjunctivitis, being rapid and inexpensive.
4. Although conjunctivitis is not a major cause of ocular morbidity or visual loss, it may cause serious and permanent damage to the eye. And because it is a common multifaceted disease process that has a variety of etiologies, clinical features and treatments. Professional care is needed and microbiological studies are essential for confirmation of clinical diagnosis and to institute an appropriate and effective treatment.
5. In this study no fungal species were isolated from any patients sample.

6. The optimum treatment for bacterial conjunctivitis is still being studied.

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