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Original Research Article

Acute Bacterial Conjunctivitis in Pediatric Clinic: Causes and Management

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Abstract

Bacterial conjunctivitis is one of the most common eye infections, accounting for 70%–80% of all cases of infectious conjunctivitis in children. The objective of this study was to determine the bacteriological causative agents of acute bacterial conjunctivitis and its management in the pediatric clinic. A cross-sectional descriptive hospital-based study was conducted in pediatric clinic at Ain Al-Khaleej Hospital, in Al-Ain City, Abu-Dhabi, UAE. It included 96 children who were diagnosed as acute conjunctivitis between December 2015 and July 2016 out of 2560 patients seen in the clinic same period. The age of the patients ranged from 0 day to 15 years. All patients had conjunctival swab obtained for culture and sensitivity. 2560 patients were seen during the study period; 96 (3.75%) had acute conjunctivitis. 56 were found to have positive bacterial cultures (58.33%) and 40 patients were found to have negative cultures (41.6%). The most common organism isolated was H*aemophilus influenzae* 27 patients (48.2%). Other organisms included; *staphylococcus Epidermidis* 15 patients (26.7%), *staphylococcus aureus* 6 patients (10.7%), *streptococcus pneumoniae* 5 patients (8.9%) and others 3 patients (5.3%). Most patients treated with combination of fucidin ophthalmic drops and Gentamycin eye ointment or ciprofloxacin eye drops and gentamycin eye ointment with excellent results. This publication shows that there are no standardized guidelines when it comes to this disease and that there are newer treatment options that may help make this condition of shorter duration, reducing the infectivity and lessen the burden for the patient and family.

Keywords: Bacterial conjunctivitis, Conjunctivitis, Eye-infections, Pediatric

INTRODUCTION

Bacterial conjunctivitis is a microbial infection of the mucous membrane of the conjunctiva of the eye and can occur in both adults and children. It is produced by an array of microorganisms, with the most common bacterial pathogenic organism worldwide being *Staphylococcus aureus. Haemophilus influenzae* is the most common isolate in children less than seven years of age. In most instances, the infection begins unilaterally, with the fellow eye becoming involved within a few days. Although, it is typically considered a minor infection, bacterial conjunctivitis can have a considerable impact on school attendance, lost work time and very occasionally, can result in permanent or sight-threatening sequelae such as bacterial keratitis and endophthalmitis in extreme cases (Smith AF, Waycaster C, 2009).

Bacterial conjunctivitis is one of the most common eye infections, accounting for 70%–80% of all cases of infectious conjunctivitis in children (Bremond-Gignac D et al, 2015).

In accordance with this, the majority of cases are

caused by infections, followed by allergic conditions. Some seasonal variations have been described; bacterial conjunctivitis shows a peak occurrence during December–April (Gunnar Høvding, 2008). Acute bacterial conjunctivitis is a significant healthcare concern in the United States. In 2005, it was estimated there were 1,356,693 outpatient visits for conjunctivitis in children less than 15 years old (Golde, Kimberly T. 2011).

In preschool- and school-age children, *Haemophilus influenzae* and *Streptococcus pneumoniae* are the most common pathogens, and thus quite different from the bacteriological profile in adults in whom *Staphylococcus epidermidis*, coagulase-negative *staphylococcus,* and *S. aureus* pathogens are predominantly found (Bremond-Gignac D et al, 2015).

The most prevalent bacteria were Haemophilus influenzae (44.8%) and Streptococcus pneumoniae (30.6%) followed by Staphylococcus aureus (7.5%), S. viridans (7.2%), *Moraxella catarrhalis* (6.8%) and *Enterobacteriaceae* (4.2 %) (B. OrdenMartínez, 2004). Conjunctivitis caused by *S. aureus* is most frequently seen in neonates and in older children, as well as in adults and the elderly (Gunnar Høvding, 2008). Gonococcal ophthalmia-neonatorum can occur in up to 10% of infants exposed to gonorrheal exudate during delivery, despite prophylaxis, and can be associated with bacteremia and meningitis (John Epling, 2010).

Acute bacterial conjunctivitis typically presents with burning, irritation, tearing and, usually, a muco-purulent or purulent discharge. Patients with condition often report that their eye lids are matted together on awakening. Conjunctival swelling and mild lid edema may be noted (Gary I. Morrow, Richard I. Abbot, 1998). Complications can range from mild corneal irritation to severe visual loss, which develops in cases caused by extremely pathogenic bacteria, such as *Chlamydia trachomatis* or *Neisseria gonorrhoeae (*Smith AF, Waycaster C, 2009). Otitis media can occur in 25% of children with H. influenzae conjunctivitis, and meningitis can develop in 18% of persons with meningococcal conjunctivitis. Conjunctivitis resolves spontaneously without treatment within 2 – 5 days in more than one half of persons, but infectious complications rarely occur (John Epling, 2010).

Although acute bacterial conjunctivitis is usually self-limited and does not cause any serious harm, there are several justifications for treatment. These include decreasing patient morbidity by shortening the course of the disease, reducing person-to-person spread, lowering the risk of sight-threatening complications such as corneal ulceration and eliminating the risk of more widespread extra-ocular disease. Culture should be obtained in certain patients, including young children and debilitated persons. However, empiric treatment with a topical medication is a safe and cost-effective approach in most patients with clinically mild acute bacterial conjunctivitis (Gary I. Morrow, Richard I. Abbot, 1998).

Studies comparing the effectiveness of different ophthalmic antibiotics did not show one to be superior. The choice of antibiotic should be based on cost-effectiveness and local bacterial resistance pattern. If the infection does not improve within one week of treatment, the patient should be referred to ophthalmologist (Holy Cronau, 2010).Until now, topical antibacterial therapy has generally been preferred by both physicians and patients because this will usually shorten the course of the disease slightly and allow the early re-admittance of children to their kindergarten or school. (Gunnar Høvding, 2008).

METHODOLOGY AND RESULTS

A cross-sectional descriptive hospital-based study conducted at Ain Al-Khaleej Hospital, Al-Ain city, Abu-Dhabi, UAE from December 2015 to July 2016 (8 months). It included 96 children with acute conjunctivitis attended the pediatric clinic. This represented 3.75% of all patients attended the clinic during the same period (2560 patients). The age of the patients ranged from 1 day to 15 years. All patients had conjunctival swab collected for culture and sensitivity.

Males were 51 and females were 45; the ratio was 1.1:1. There was 3 infants aged less than 2 months (3.1%), 28 between 2 months to one year (29.1%), 47 between 1 year to 5 years (48.9%) and 18 more than 5 years (18.75%) (Figure1). Out of 96 patients 56 were found to have positive culture (58.33%) and 40 patients had negative culture (41.6%). The most common organism isolated was *haemophilus influenzae* 27 patients (48.2%). Other organisms included; *staphylococcus Epidermidis* 15 patients (26.7%), *staphylococcus aureus 6* patients (10.7%), *streptococcus pneumoniae* 5 patients (8.9%) and others 3 patients (5.3%) (Figure 2) and (Figure 3). There were 3 young infants from 1 day to 2 months, 2 of them had streptococcal conjunctivitis while the third had negative culture.

Most patients presented with symptoms related to conjunctivitis and upper respiratory tract infections 40 children presented with eye discharge (71.4%), 38 children with runny nose (67.8%), 32 children with cough (57.1%), 19 children with fever (33.9%), 6 with acute otitis media (10.7%), 5 children with lid swelling (8.9%) (Table1). Most patients treated with combination of fucidin ophthalmic drops and Gentamycin eye ointment or ciprofloxacin eye drops and gentamycin eye ointment with excellent results.

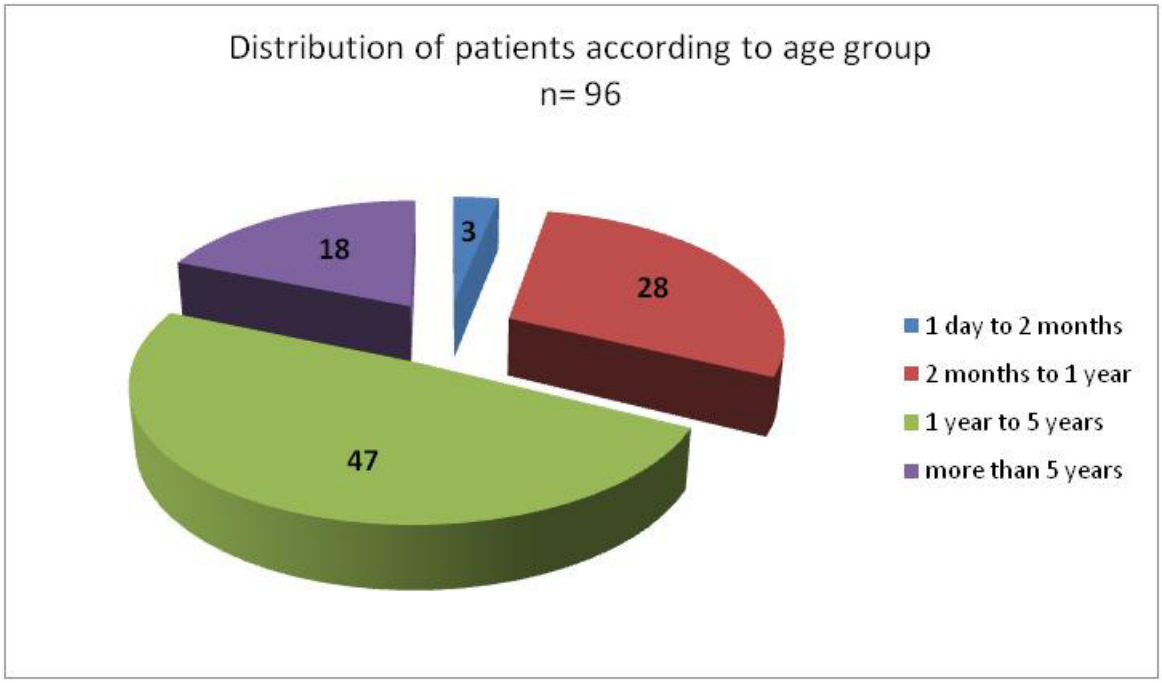

Figure 1. Distribution of patients according to age group

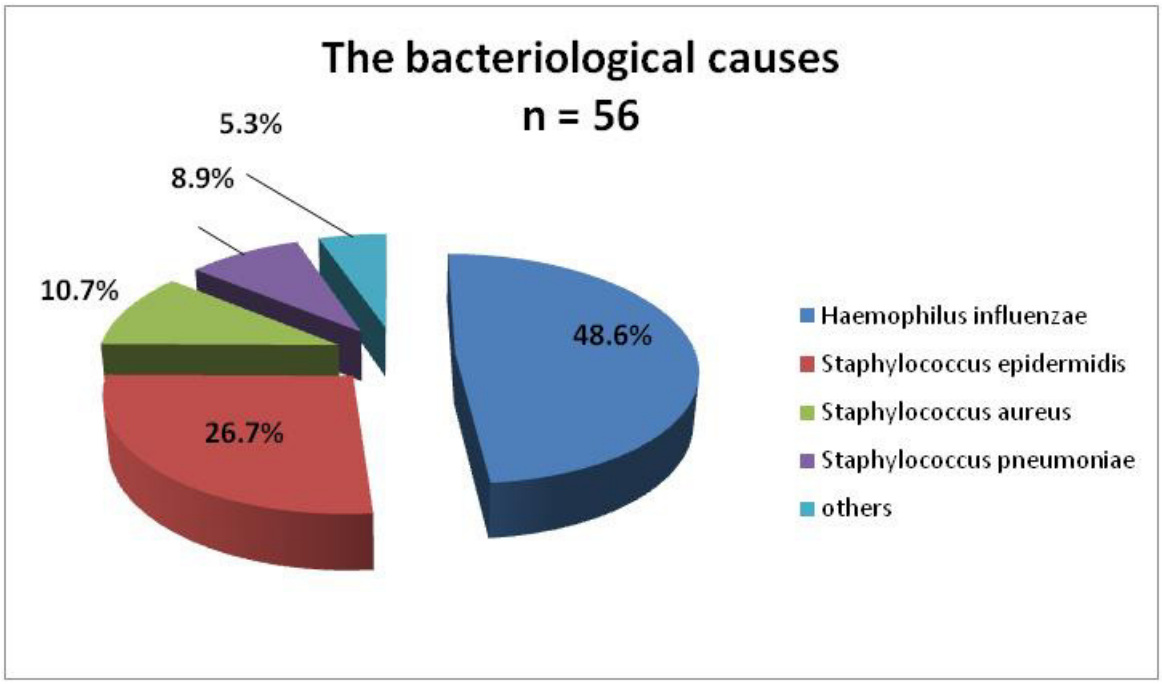

Figure 2. Distribution of bacteriological causes

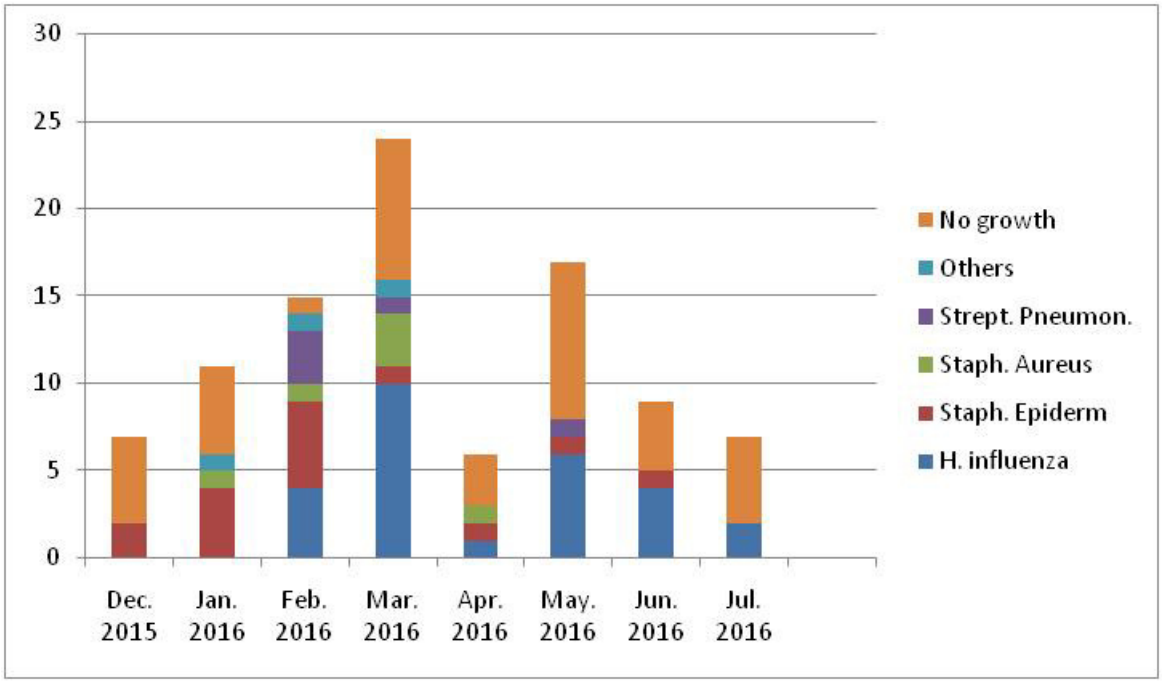

Figure 3. Distribution of causative agents according to time of presentation

Table 1. Showed the associated presenting symptoms

Symptoms	Frequency	Percentage %
Eye discharge	40	71.4%
Runny nose	38	67.8%
Cough	32	57.1%
Fever	19	33.9%
Acute otitis media	6	10.7%
Lid swelling	5	8.9%

DISCUSSION

Our study included 96 children diagnosed with acute conjunctivitis which constituted 3.75% of all children (2560 patients) seen in the clinic in the same period. 56 out of 96 (58.33%) were found to have acute bacterial conjunctivitis. This is similar to that reported by Aziz Sheikh and Brian Hurwitz in Saudi Arabia where they found that the syndrome of 'acute red eye' accounts for between 1% and 4% of consultations with primary care physicians and bacterial conjunctivitis was the commonest condition diagnosed (Aziz Sheikh and Brian Hurwitz, 2001). Yet, (Dominique Bremond-Gignacet al, 2015) reported that bacterial conjunctivitis is one of the most common eye infections, accounting for 70%–80% of all cases of infectious conjunctivitis in children. Dominique Bremond-Gignacet al, 2015 and Golde, Kimberly T et al, 2011 reported almost similar result (65 - 75%).There was no significant gender variation as the male to female ratio was 1.1:1.

The most common organism isolated was haemophilus influenzae 27 patients (48.2%). Other organisms included; staphylococcus Epidermidis 15 patients (26.7%), staphylococcus aureus 6 patients (10.7%), streptococcus pneumoniae 5 patients (8.9%) and others 3 patients (5.3%) (Figure2) (Figure3). There were 3 young infants from 1 day to 2 months, 2 of them had streptococcal conjunctivitis while the third had negative culture. (Gunnar Høvding, 2008)reported Acute bacterial conjunctivitis is most frequently caused by *S. aureus, Staphylococcus epidermidis, H. influenzae, Streptococcus pneumoniae, Streptococcus viridans, Moraxella catarrhalis* and Gram-negative intestinal bacteriaand (Hazel A Everitt et al 2006) reported the main organisms were *Haemophilus influenzae*, *Streptococcus pneumoniae* and *Staphylococcus aureus.*

It was reported only a low or moderate risk of transmission in infectious conjunctivitis and found no general recommendation for exclusion from preschool or school. However, the conclusions drawn were poorly evidence-based; infectivity and need for exclusion, etc. will obviously be different in adenoviral and bacterio-

logical infections. There are also numerous reports on outbreaks of acute bacterial conjunctivitis in day-care centers, boarding schools, military camps, nursing homes, intensive care units, etc., but exact and evidence-based knowledge about the infectivity and community spread of acute bacterial conjunctivitis is generally lacking (Gunnar Høvding, 2008).

Delayed prescribing of antibiotics is probably the most appropriate strategy for managing acute conjunctivitis in primary care. It reduces antibiotic use, shows no evidence of medicalization, provides similar duration and severity of symptoms to immediate prescribing and reduces re-attendance for eye infections (Hazel A Everitt et al 2006).

CONCLUSION AND RECOMMENDATIONS

Our study and the study by (Steven J. Lichtenstein, 2009) Came to the same conclusions: it does show that there are no standardized guidelines when it comes to this disease and that there are newer treatment options that may help make this condition of shorter duration, while reducing the infectivity and decreasing impact on the child and family.

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Disclosure of Conflict of Interest: Nil to disclose.

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