NEONATAL CONJUNCTIVITIS: A PROFILE

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ABSTRACT

Neonatal conjunctivitis is one of the commonest infections encountered in the newborn. A prospective study was conducted on all babies born over a period of one year. No prophylactic ocular medication was instilled routinely in newborns. Babies developing purulent eye discharge were diagnosed to have conjunctivitis. Eye Swab from the neonates and maternal vaginal/cervical swabs were sent for culture. Chloromycetin eye drops were used for treatment and in case of no response, changed as per sensitivity report or to gentamicin eye drops. Oral erthromycin was given for dacryocystitis or when there was no response to topical therapy.

The incidence of conjunctivitis was 7.2%. Two seasonal peaks, namely, February and then May and June, were noted. In 91.6% of the babies, conjunctivitis developed within the first week. A prolonged rupture of membranes was associated with a significantly higher incidence of conjunctivitis ($p < 0.01$). The most common organism grown from conjunctival swab was Staph aureus (35.2%) followed by Enterococcus (4.3%), Klebsiella (3.5%) and E. coli (2.8%). From vaginal/cervical swabs, E. coli was the most common organism isolated. No concurrence of organisms was noted between eye swabs and vaginal/cervical swabs. A uniformly good response to chloromycetin eye drops was noted with only 3.5% requiring a change of therapy.

It is concluded that neonatal conjunctivitis is commonly acquired postnatally and responds well to topical chloromycetin therapy. Oral erythromycin may' be used in resistant cases which will cover the chlamydial infection also.

Key words: *Conjunctivitis, Neonate.*

From the time of Crede' when gonococcal ophthalmia was common, to the present day, neonatal conjunctivitis remains one of the commonest infections encountered in the newborns. Although the silver nitrate prophylaxis advised by Crede'(l) more than a hundred years ago has gone a long way in reducing the gonococcal infection of neonatal eyes, but other organisms continue to cause morbidity. The range of offending agents is diverse, from bacteria to viruses and chlamydiae. Silver nitrate itself has also been implicated for causing chemical conjunctivitis as well as other problems(2). As a result many places have discontinued the silver nitrate prophylaxis or are using other agents(3). In our hospital, no prophylactic agent has been used for many years. Conjunctivitis being a common infection, the present study was planned to see the incidence, causative agents and treatment response. As the facilities for chlamydial cultures or antibody estimation do not exist, this organism was not studied.

Material and Methods

All babies born in the Obstetrics Department over one year period were studied prospectively. The duration of ruptured membranes, unsterile pelvic examinations done by Dais and (lie route of delivery were also noted.

As a routine hospital practice, eyes were wiped clean with sterile swabs and no prophylactic medication was instilled in the eyes. The babies who developed purulent

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eye discharge were diagnosed to have conjunctivitis. In all these babies, eye swabs were sent for culture before starting on any treatment. Whenever possible, maternal vaginal/cervical swabs were also sent. Babies were started on chloromycetin eye drops which were continued for 1-2 weeks. In case of no response, the treatment was changed as per sensitivity report or to gentamicin eye drops. Oral erythromycin was given when dacryocystitis was suspected or when there was no response to topical therapy. Statistical analysis was done using Chi square test.

Results

Of 1972 live births, 142 babies developed conjunctivitis, incidence being 7.2%. The incidence was significantly ($p < 0.01$) higher (8.7%) among male neonates as compared to females (5.3%).

Two peaks of conjunctivitis, the first in late winter, *i.e.,* February and the second in height of summer during the months of May and June were observed.

The onset of conjunctivitis was within the first week in 91.6% of the babies and only 8.4% developed eye discharge after 7 days *(Table I).* Rupture of membranes of more than 12 hours was found to increase the incidence of conjunctivitis significantly ($p < 0.01$). Unsterile pelvic examinations did not increase the likelihood of developing conjunctivitis. The incidence of conjunctivitis was almost the same among babies delivered vaginally or by Cesarean section *(Table II).*

TABLE I -*Age of Onset*

Age (days)	No.	%
<1	4	2.8
1-3	65	45.8
4-7	61	43.0
>7	12	8.4
Total	142	100.0

TABLE II–*Some Ante/Intranatal Factors*

Factors	Present		Not present	
	Total	Conjunctivitis	Total	Conjunctivitis
Rupture of membranes >12 hrs	176	22 (12.5)	1796	120* (6.7)
Unsterile per vaginal examination	149	12 (8.1)	1823	130 (7.1)
Vaginal delivery	1444	95 (6.5)	520	47 (8.9)

* $p < 0.01$ (s).

P/V–Per vaginal examination.

Figures in parentheses are percentages.

Of 142 eye swabs cultured, 61 (43%) showed no growth and 5 (3.5%) were lost. The most common organism grown was *Staph. aureus* (35.2%), followed by *Entero--coccus* (4.3%), *Klebsiella* (3.5%), *E. coli* (2.8%) and *Pseudomonas* (3.7%), *(Table III)*. Vaginal/cervical swabs could be sent in 113 mothers (79.5%). No growth was seen in 60.3% and the commonest organism grown was *E. coli* (17.7%) *{Table IV)*. The organisms grown from the eye swab were matched with the ones isolated from maternal vaginal/cervical swab and no concurrence was noted.

A good response to chloromycetin eye drops was seen in 96.5% of the babies and only 3.5% required a change to gentamicin eye drops. Two cases (1.4%) developed dacryocystitis which responded well to oral erythromycin and massaging of lacrimal sac. Parenteral antibiotics were given to 11.9% of babies for other reasons.

Discussion

Conjunctivitis or purulent discharge from one or both eyes is the commonest infection during the neonatal period(4,5). The neonate's conjunctiva is more prone to infection as it has lower levels of lysozyme and IgA in the tears and also the flow of tears and the tear film are not developed yet(6). The incidence of conjunctivitis among newborns in the present study was 7.2% which is comparable to 8.4% reported by Prentice *et al.* (7). Rao *et al.* observed that 57.2% of the infants studied by them had developed conjunctivitis by 48-72 h of age(8). A much lower incidence of 0.87% has been reported by Armstrong *et al.(9)*. Marked seasonal variation was noted in the present study with two peaks of occurence first in February and second in summer. Armstrong *et al.* found that attack rates for all types of conjunctivitis were more during the third quarter of the year, *i.e.,* July to October while staphylococcal conjunctivitis was seen more often from April to October(9).

The incubation period of conjunctivitis may be of help in knowing the causative agent to a certain extent. While chemical conjunctivitis due to silver nitrate application occurs within 48 h of birth, chlamydial

TABLE III- *Organisms Cultured from Neonatal Conjunctivae*

Organism	n	%
Staph aureus	50	35.2
Enterococcus	6	4.3
Klebsiella	5	3.5
E. coli	4	2.8
Pseudomonas	1	0.7
Staph albus	10	7.0
Lost	5	3.5
No growth	61	43.0
Total	142	100.0

TABLE IV– *Organisms Cultured from Maternal Passages*

Organism	n	%
E. coli	20	17.7
Klebsiella	10	8.8
Staph aureus	6	5.3
Proteus	6	5.3
Acinetobacter	3	2.6
No growth	68	60.3
Total	113	100.0

more. Gonococcal infection has an early onset, *i.e.,* within 1-4 days after birth. The onset with infection due to other organisms has been reported to be variable(l0). A majority of the babies in the current study had developed conjunctivitis within the 1st week. Armstrong *et al.* in a chart review found the mean incubation period for gonococcal infection as 6.5 days while a significantly longer period of 8.1 days was noted for chlamydial infections(9). Rowe *et al.* also noted that more of chlamydial culture positive babies reported eye discharge after 6 days as compared to non-chlamydial infections(ll). In contrast, Sandstroms *et al.* did not find any correlation of age of onset with the cause(12).

The possibility that neonatal conjunctivitis is often contracted while passing through infected maternal passages has been well exemplified by studies on gonococcal and chlamydial infections(9). The prolonged rupture of membrane also increases the likelihood of acquiring infection. In this study, the prolonged rupture of membranes increased the occurence of conjunctivitis significantly. No difference was noted among babies born vaginally or by Cesarean section. Unsterile pelvic examinations in the mother also did not influence the development of conjunctivitis. Similarly, no correlation between conjunctivitis and various factors like prolonged labor, mechanical intervention, vaginal examination has been noted by others(7,8,13). Further, evidence that source of infection may be other than maternal passages was found on correlating the cultures from conjunctiva and maternal vagina. No concurrent growth of organisms was noted. In addition, the most common organism in the present study was *Staph. aureus* which is known to be acquired after birth. In contrast, *E. coli* was more commonly isolated from maternal cultures. Some studies have reported a high degree of correlation between the organisms grown from maternal cervix and neonatal conjunctivae soon after birth(8,14). As in the current study, *Staphylococci* have been found to be a common infecting agent by others also(8,9,15). An increase in incidence of staphylococcal conjunctivitis has been anticipated by Armstrong *et al.* as the use of hexachlorophene is decreasing(9).

In the present study, 42.9% of the conjunctival cultures did not reveal any growth which may be explained by other organisms like anaerobes or viruses. Similarly, Armstrong observed that 44.4% of the conjunctivitis was of uncertain etiology while Prentice *et al.* could not isolate any microorganism in 53.5% of cases(9,7).

We found a uniformly good response to chloromycetin eye drops and according to sensitivity reports also 73.7% of the organisms were covered by this. Prentice *et al.* observed an excellent response to neomycin(7). Pierce *et al.* have reported, after antibiotic sensitivity tests, that chloromycetin was effective against all bacterial cases but not inclusion conjunctivitis(13). For mild to moderate conjunctivitis, Sandstroms has recommended only lid hygiene.

To summarize, neonatal conjunctivitis nowadays is more likely to be acquired postnatally. It occurs during the first week and responds well to local chloromycetin application which covers the common causative bacteria. In resistant cases, oral erythromycin could be useful as it would also help in treating ocular as well as systemic chlamydial infection(15).

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