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Original Article

A Randomized Control Trial for conservative management of parotid abscess in children

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Abstract

Background: The optimal conservative treatment protocol of parotid abscess in children is evaluated.

Material and Methods: This is a randomized, prospective, cross-sectional study conducted between 1st February 2016 to 31st January 2018 in Nobel Medical College and Teaching Hospital. Thirty children (below 14 years age) suffering from parotid abscess diagnosed by ultrasonography were included in this study. Recurrent parotid abscess cases were excluded. The children were divided into 2 groups by computer assisted randomization into 15 patients each. Group A were treated with intravenous Clindamycin while group B were given intravenous Ampicillin + Cloxacillin combination.

Results: Five patients of group B did not respond to treatment and were then put on intravenous Clindamycin. Three of these patients responded to treatment but 2 developed multi-lobulated fluctuation and required incision + drainage. Remaining 10 patients in group B and all patients in Group A responded to medical treatment without recurrence. Five patients in group B developed severe diarrhea during antibiotic treatment but none of the patients in group A had this complaint. No patient developed any complications like parapharyngeal abscess or septicemia.

Conclusion: Parotid abscess in children can be managed conservatively with intravenous Clindamycin without the need for incision and drainage.

Key Words

Parotid abscess, children, conservative management

Introduction

Acute suppurative parotitis is rare in children but may occur frequently in premature newborn. Acute suppurative parotitis in adults is related to poor hygiene, long term debility and reduction in salivary flow [1]. In children however, a parotid abscess can occur even with no history of oral pathology². Untreated or delayed presentation usually complicates as parapharyngeal abscess or even septicemia. This study has been conducted to evaluate the etiopathology and optimal treatment protocol of parotid abscess in children.

Material and Methods

This is a randomized, prospective, cross-sectional study conducted between 1st February 2016 to 31st January 2018 at Nobel Medical College and Teaching Hospital, Biratnagar Nepal, involving 30 children below 14 years age. All patients had presented with painful parotid swelling and erythema of overlying skin. Pus was collected by milking the Stenson's parotid duct and sent for culture + sensitivity test. A combination of parotid swelling, purulent exudation from the parotid duct and growth of pathogenic bacteria in culture of the pus was taken as the diagnostic criteria for suppurative

parotitis. However, only 19 patients had pus exuding from parotid duct so the diagnosis of parotid abscess was confirmed by ultrasonography in all cases. Recurrent parotid abscess cases were excluded from this study.

Parotid abscess in children being an emergency condition, prevented the prescription of antibiotics according to the culture and sensitivity report. The children were thus divided into 2 groups of 15 patients each by computerized assisted randomization. Group A were treated with intravenous Clindamycin (10mg/kg TID) while group B with Ampicillin + Cloxacillin combination (100 mg/kg/day were given by intravenous route for about 7 days). The two groups were then evaluated for treatment outcome, development of complications of parotid abscess and side-effects of treatment like diarrhea.

Informed consent was taken from the patient's guardian. Ethical clearance was taken from the ethical review board of the hospital.

Results

The age incidence ranged from 2 months to 11 years with a mean age was 7 years. Out of the 30 patients only 5 were infants. Twenty patients were male and 10 were female. The right parotid gland (19 cases) was affected more than the left side (11 cases). The presenting clinical features are summarized in Table 1.

Table 1: presenting features

Presenting feature	Number of patients	Percentage (%)
Fever	30	100
Painful parotid swelling	30	100
Erythema over parotid area	30	100
Pain on chewing	22	73
Pus from Stenson's duct	19	63
Referred pain to ear	17	57
Dehydration	13	43
Halitosis	7	23
Trismus	0	0

No congenital anomalies of parotid gland were seen in ultrasonography. No systemic illness were also found in the patients that could lead to parotid abscess. Ten patients in group B and all patients in Group A responded to medical treatment without recurrence. Five patients in group B did not respond to medical treatment as confirmed by:

1. Pain and erythema not decreasing even after 48 hours of intravenous antibiotics.
2. Fluctuation appeared in parotid area even after 48 hours of antibiotics.

Wide bore needle aspiration of pus was done in these 5 patients and they were then started on intravenous Clindamycin. Pus collected from these patients were also sent for culture and sensitivity test. Three of these patients responded to treatment but 2 developed multi-lobulated fluctuation and required incision + drainage by modified Blair's incision. They were also given intravenous Gentamycin (5 mg/kg/day) for 7 days. These patients also responded to treatment without any recurrence.

In group B, 5 patients who only received Ampicillin + Cloxacillin, developed severe diarrhea during antibiotic treatment but none of the patients in group A had this complaint. No patient developed any other complications. These results are summarized in Table 2.

Table 2: response to treatment + complications

Presenting feature	Group A (Clindamycin)		Group B (Ampicillin + Cloxacillin)	
	No.	%	No.	%
Complete resolution of symptoms	15	100	10	66.7
Requirement for needle aspiration	0	0	3	20
Requirement for incision + drainage	0	0	2	13.3
Severe diarrhea	0	0	5	33.3
Parapharyngeal abscess	0	0	0	0
Septicemia	0	0	0	0

The culture and sensitivity reports in 24 patients (19 from pus collected via parotid duct and 5 from failure cases by needle aspiration) were analyzed. *Staphylococcus aureus* (12 cases) was the commonest pathogen isolated, followed by *Streptococcus pneumoniae* (6 cases). All organisms were found to be sensitive to Clindamycin and most of them resistant to Penicillin. The sensitivity results are summarized in Table 3.

Table 3: sensitivity results

Causative organism	Sensitive to	Resistant to
<i>Staphylococcus aureus</i>	Erythromycin, Gentamicin, Ciprofloxacin, Clindamycin	Penicillin, Cefixime
<i>Streptococcus pneumoniae</i>	Erythromycin, Gentamicin, Ceftazidime, Clindamycin	Penicillin, Cefixime, Ceftriaxone
<i>Haemophilus influenza</i>	Amoxicillin, Ceftazidime, Clindamycin	Ciprofloxacin, Vancomycin
<i>Escherichia coli</i>	Gentamicin, Ciprofloxacin, Clindamycin, Metronidazole	Amoxicillin, Coamoxyclav, Cefipime

Discussion

Juvenile recurrent parotitis is characterized by recurrent episodes of swelling and pain in parotid gland. This condition is usually misdiagnosed as mumps but in contrast, the swelling is recurrent and affects the parotid gland unilaterally and when bilateral, one gland is affected less than the other [3]. The onset of disease is early in life with a peak during 3-5 years of age. It is usually accompanied by pain, fever and malaise and the frequency of exacerbations can be quite variable, though the disease disappears completely in adult life [4]. The disease is more common in males as seen in this study and also reported by Chitre et al [5].

Pus culture of parotid duct discharge is usually positive for *Staphylococcus aureus* [2,4,6, 7] and also seen in this study. Other bacteria have also been reported to

be involved like anaerobic bacteria [8], *Streptococcus pneumoniae* and *Haemophilus influenza* [9]. The right side was affected more often. No patient had bilateral symptoms nor any oral pathology in this study. Similar findings were reported by Spiegel et al [10].

Five patients in group B of this study did not respond to medical treatment. Wide bore needle aspiration of pus was done under the ultrasonography guidance and pus sent for culture sensitivity. Since the culture was sensitive to Clindamycin, these patients were then started on intravenous Clindamycin. 3 of these patients responded to this treatment but 2 patients developed multi-lobulated fluctuation and required incision + drainage by modified Blair’s incision. Only 32 cases of neonatal suppurative parotitis have been described in the English literature in the last 35 years. Recovery was achieved in 78% of these patients with antibiotic therapy while 22% cases required surgical drainage [10].

The most serious complication of parotitis and parotid abscess include facial nerve palsy, severe neck swelling with airway obstruction [11]. None of the patients in this study developed any of these complications. In group B of this study, 5 patients who only received Ampicillin + Cloxacillin, developed severe diarrhea during antibiotic treatment but none of the patients in group A had this complaint. Historically, the principal reason for the restricted use of clindamycin in dentistry has been a concern regarding potential adverse events, in particular, the development of *Clostridium difficile* diarrhea or pseudomembranous colitis. Incidence of *Clostridium difficile* infection with clindamycin is no greater than that with amoxicillin or amoxicillin/clavulanate [12].

Clindamycin works by inhibiting protein synthesis at the bacterial 50S ribosomal subunit, thus interfering with the process

of peptide-chain formation in bacteria. Clindamycin has a high level of in vitro activity against a variety of gram-positive organisms and strictly anaerobic bacteria. Of specific interest is the extremely low incidence of resistance to clindamycin, even in countries such as Germany and Japan, where this agent is used frequently to treat acute dental infections¹³.

Clindamycin reaches high concentrations in saliva, gingival crevicular fluid, and bone. Studies have shown that the concentration of clindamycin in these tissues is approximately 40% to 50% of the concentration in serum [14]. The high intracellular concentration of clindamycin and extended activity inside the bacterium yield a post-antibiotic effect by which the antimicrobial remains active although serum concentration levels are subinhibitory [15].

Conclusions

Parotid abscess is an emergency condition in children. It can be managed conservatively with intravenous Clindamycin without the need for incision and drainage. On this basis, Clindamycin should be considered as a first-line antimicrobial for all parotid infections.

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