

Effectiveness of Single Dose Oral Corticosteroids in Relief of Pain due to Acute Tonsillitis and/or Acute Pharyngitis

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ABSTRACT

Introduction

Throat pain due to acute tonsillitis and acute pharyngitis hamper with oral intake, speech and swallowing leading to feeling of general weakness and inability to work. The objective of this study was to evaluate the efficacy of single dose of oral corticosteroids for improving or resolving of pain in adults with acute tonsillitis/acute pharyngitis.

Methods

This study was quasi-experimental study conducted on patients aged 16 years and above with acute tonsillitis/acute pharyngitis were included in the study. A total of 88 patients were included out of which, 46 patients received steroids as a single dose of oral prednisolone (Group A) and in 42 patients, steroids were not used (Group B). Pain score, assessed at 24 hour and 48 hours on Visual Analogue Scale (VAS); and pain duration were compared between two groups.

Results

There was a male preponderance with male to female ratio of 3:1. Age ranges from 17 to 32 year. The most common symptom was odynophagia presenting in 86 patients out of 88. Pain score at 24 hours was 4.59 ± 0.98 hour in group A and 6.28 ± 1.21 hour in group B ($p < 0.001$). Pain score at 48 hours was 0.41 ± 0.68 hour in group A and 2.98 ± 0.90 hour in group B ($p < 0.001$). Time until onset of pain relief was 3.56 ± 0.98 hour in group A and 5.90 ± 1.08 hour in group B ($p < 0.001$). Time until complete pain relief was 42.61 ± 6.44 hour in group A and 58.71 ± 17.19 hour in group B ($p < 0.001$).

Conclusion

In adult patients with acute sore throat due to acute tonsillitis and/or acute pharyngitis, single dose of oral prednisolone was effective in reducing pain as well as shortening the duration of pain when compared to the group where it was not used.

Keywords

Acute pharyngitis; acute tonsillitis; corticosteroids; pain.

INTRODUCTION

Throat pain is one of the common symptom in patients presenting in outpatient department or emergency department. This accounts for about 1 in 50 of all mobile patient visits and resulting in considerable costs.^{1,2} This can be symptom of diseases like acute tonsillitis, acute pharyngitis, acute peritonsillitis, peritonsillar abscess, aphthous ulcer etc. Among various symptoms, pain is significant as it can hamper with feeding, speech and swallowing leading to feeling of general illness. Throat pain is a common complaint in emergency departments, accounting for 1-2% of outpatient visits and leading to significant days lost from work or school³.

Acute tonsillitis/acute pharyngitis is most frequently caused by viruses like rhinoviruses, coronaviruses, influenza A and B and the parainfluenza viruses and less frequently by bacteria like Group A streptococci.⁴ It presents with throat pain, odynophagia, swollen, congested and enlarged tonsils with tender cervical lymph nodes.⁵ The treatment plan includes symptoms alleviation by using analgesics and antipyretics and antibiotics if bacterial infection is suspected. Antibiotic treatment shortens the duration of symptoms in a bacterial throat infection (from 3.3 to 2.7 days).⁶ Commonly used antibiotics are penicillin, cephalosporins, macrolides

Acute tonsillitis and/or pharyngitis cause release of pro-inflammatory mediators which leads to pharyngeal inflammation and symptoms of throat pain.⁷ Corticosteroids offer symptomatic relief from throat pain because of inhibiting release of pro-inflammatory mediators.⁸ Short courses of even high-dose oral steroids are considered to be safe if there is no specific contraindication.⁹

Although there is benefit shown by studies in use of steroid for acute sore throat, very few studies are done in our setup. So, we planned to use single dose of corticosteroids for patients with acute tonsillitis/ acute pharyngitis. The aim of our study was to evaluate the efficacy of single dose of oral corticosteroids for pain relief in adults with acute tonsillitis and/or pharyngitis.

METHODS

It was a quasi-experimental study conducted in the Department of ENT-HNS, National Medical College and Teaching Hospital, Birgunj-18, Parsa, Nepal for duration of one year between November 2016 to October 2017. The research was approved by the Institutional review committee (IRC) of the National Medical College. Inclusion criteria were age range of 16-60 years with acute tonsillitis and/or acute pharyngitis and symptom duration of less than 7 days. Exclusion criteria were pregnant and lactating female, Patient with immune deficiency,

active chemotherapy or malignancy, sore throat following tonsillectomy, intubation or peritonsillar abscess, and unwilling patients. Total 88 patients were enrolled in study. These patients were divided into two groups. Group A who came first in OPD (Corticosteroids used) and Group B who came later (Corticosteroids not used). Informed consent has been obtained from every patient to participate in the research.

Patients with throat pain due to acute tonsillitis and/or acute pharyngitis visiting the department of ENT-HNS at National Medical College and Teaching Hospital were included for study. Patients under study groups were taken detailed history and clinical examination was performed. Examination of oral cavity and oropharynx was done to note the grade of tonsil (according to Brodsky Grading Scale)¹⁰, exudation, congestion of tonsil and pharyngeal congestion. Cervical lymph node examination was done to note the level of lymph node involvement and tenderness.

Both groups received Amoxicillin plus clavulanic acid (625 mg per orally three times a day for 7 days) and combination of Paracetamol 500mg and Ibuprofen 400mg (1 tablet per orally three times a day for 2 days). In addition, group A received single dose of prednisolone at 1 mg per kg (maximum 60mg).

Patients were provided with VAS (Visual Analogue Scale) chart during consultation Outpatient Department (OPD) and evaluated on basis of pain score in VAS (10 level, 0 for no pain and 10 for severe pain). Pain score in VAS was recorded at the time of onset of treatment, at 24 hours and 48 hours. Time until onset of pain relief and time to complete pain relief was recorded in the same chart and was collected on the follow up basis on 7th day. Fortunately, all patients came for follow up at 7th day. The data were collected according to proforma and were entered in using Microsoft Excel 2010. Percentage, proportion and contingency tables were used for description of the data. The results were tabulated and comparisons of outcomes between two groups were performed. Chi-square test was used to compare mean of the groups. Comparisons of outcomes between two groups were performed by student's t test. IBM SPSS version 20.0 used to analyze results. We regarded p-values less than 0.05 as significant.

RESULTS

Out of the total 88 patients included in the study, 46 were in group A where corticosteroids (prednisolone) were used and 42 were in group B where corticosteroids was not used. Other medication used were same on both groups. In the present study overall sex distribution showed a male preponderance with male to female ratio of 3:1. In group A, there were 40 males and 6

Table 1. Symptoms frequency of patients included in the study (n=88)

Symptoms	Study group		Total (n=88)	p value
	Steroid Used (Group A) (n=46)	Steroid not Used (Group B) (n=42)		
Odynophagia (%)	46	40	86	0.23
Fever (%)	15	17	32	0.51
Past History (%)	8	13	21	0.21

Table 2. Oral cavity and neck examination findings

Symptoms	Study group		p value
	Steroid Used (Group A) (n=46)	Steroid not Used (Group B) (n=42)	
Grading of size of Tonsils			
Grade 1	1	1	0.66
Grade 2	17	21	
Grade 3	23	16	
Grade 4	5	4	
Tonsillar Congestion			
Yes	46	39	0.11
No	0	3	
Tonsillar Exudation			
Yes	45	33	0.02
No	1	9	
Pharyngeal Congestion			
Yes	12	23	0.01
No	34	19	
Enlarged/Tender Lymph Node			
Yes	45	34	0.02
No	1	8	

females and in group B there were 26 males and 16 females. Different between two groups were statically significant ($p < 0.005$). The mean age was 23.89 ± 2.71 years in Group A whereas 24.93 ± 3.55 years in Group B and age ranged from 17 to 32 years. The age in two groups was similar ($p = 0.13$).

The common presenting complaints found in our study was odynophagia in 86 cases. It was present in 46 patients in group A and 40 patients in group B. The difference was statistically not significant ($p = 0.23$). Fever was present in 15 Group A and 17 in Group B and the difference was statistically not significant ($p = 0.51$). Past history of acute sore throat was present in 8 patients in Group A and 13 patients in Group B. The difference was statistically not significant ($p = 0.21$) (Table 1).

In both groups, most tonsils were of grade 2 and 3 (Table 2). The difference of tonsillar size in two groups was not statistically significant ($p = 0.66$).

Tonsillar congestion was seen in 85 patients out of which 46 were in Group A and 39 in Group B with no difference in two groups ($p = 0.11$). Tonsillar Exudation was present in 78 patients out of which 45 patients were in Group A and 33 in Group B. The difference was statistically significant ($p = 0.02$). Pharyngeal Congestion was seen in 35 Patients, 12 in Group A and 23 in Group B. The difference was statistically significant ($p = 0.01$). Enlarged and tender cervical Lymph nodes were present in 79 patients out of which 45 patients were in Group A and 34 were in Group B ($p = 0.02$).

In our study pain score measured on VAS at the onset of treatment was 7.76 ± 0.95 hours in Group A and 7.64 ± 0.93 hours in Group B ($p = 0.56$). Pain score at 24 hours was 4.59 ± 0.98 in Group A and 6.28 ± 1.21 in Group B ($p < 0.001$). Pain score at 48 hours was 0.41 ± 0.68 and 2.98 ± 0.90 in Group A and Group B respectively ($p < 0.001$). Time until complete

Table 4. Comparison of pain characteristics before and after treatment in two groups

Variables	Steroid Used (Group A) (n=46)	Steroid not Used (Group B) (n=42)	p value
Pain score at presentation (before treatment)	7.76±0.95	7.64±0.93	0.56
Pain score at 24 hours of treatment	4.59±0.98	6.28±1.21	<0.001
Pain score at 48 hours of treatment	0.41±0.68	2.98±0.90	<0.001
Time until onset of pain relief (in hours)	3.56±0.98	5.90±1.08	<0.001
Time until complete pain relief (in hours)	42.61±6.44	58.71±17.19	<0.001

pain relief was 42.61±6.44 hours in Group A and 58.71±17.19 hours in Group B (p<0.001).

DISCUSSION

Patients with acute tonsillitis/acute pharyngitis often present with a chief complaint of pain and difficulty in swallowing. Most of the cases are viral and hence symptomatic treatment is sufficient. Among the different symptoms, pain relief is of primary concern for the patients. Antibiotics are effective in the treatment of acute exudative tonsillitis/pharyngitis caused by Group A Beta Hemolytic Streptococcus (GABHS). The purpose of this study was to show whether oral prednisolone work in the treatment of pain of due to acute tonsillitis/acute pharyngitis in adults. Glucocorticoids decrease inflammation by different mechanisms like stabilization of leucocyte lysosomal membranes, inhibition of macrophage accumulation and reduction of capillary permeability.¹¹ Glucocorticoids, such as prednisolone, reduce inflammation by decreasing the number of white blood cells. After treatment, these cells decline within 4 to 6 hours, with lower levels persisting for 24 hours or longer.¹²

In our study the age of patients was ranged from 17 to 32 years. In our study overall sex distribution showed male preponderance of 75%. The difference of sex between the two groups was statistically significant (p<0.05). As acute sore throats are usually a viral origin, they resolve of its own and they take symptomatic treatment from over-the-counter drugs at local pharmacy. So, numbers of female visiting hospital were less.

Odynophagia was found most common symptom followed by fever in patients with acute tonsillitis/pharyngitis. The study conducted by Bulloch B et al. odynophagia leading to difficulty in swallowing solid and liquid foods was prominent symptom.¹³ Inflammation of the pharynx and surrounding tissues leads to increased throat pain, especially during swallowing, as the inflamed tissues stretch and slide over one another, resulting in odynophagia.¹⁴

In present study fever was seen in 32.6% cases (15/46) in Group A and 40.47% (17/42) in Group B. Bulloch B et al.,¹³ in their study found fever in 35 %

and 45% respectively dexamethasone and placebo group. The immune response to tonsillar infection activates the production of various cytokines, which are responsible for infection symptoms like fever and body pain.¹⁵ In our study pain score at the onset of treatment was 7.76± 0.95 in Group A and 7.64±0.93 in Group B and they were comparable (p=0.56). The pain scores in two groups used for study by another researcher was also comparable.¹³

Patients in both groups showed improvement in pain score at 24 hours but Group A patients displayed a greater degree of pain relief than Group B. Pain score at 24 hours was 4.59±0.98 in Group A and 6.28±1.21 in Group B. In present study pain score at 24 hours in steroid used group had significant reduction in pain compared with base line. Pain reduction at 24 hours between two groups were statistically significant. Various studies done comparing pain relief with or without corticosteroids had shown significant pain relief at 24 hours of treatment with corticosteroids use.^{8,16,15}

In the present study, VAS pain score at 48 hours was reduced in both groups but Group A showed significant improvement in pain compared to Group B (p<0.001). Fall in pain score at 48 hours in VAS was 7.35±1.09 in Group A and 4.76±0.79 in Group B and was statistically significant (P<0.001). Similar significant improvement in pain at 48 hours of treatment with use of corticosteroids was obtained in various studies.^{10,17} It shows that strong anti-inflammatory action of corticosteroids is effective in reducing pharyngeal oedema and ultimately significant pain reduction at 48 hours.

Time until pain relief in Group A were faster and showed marked reduction of pain compared to Group B (p<0.001). Various studies done with use of steroid has significantly faster pain relief as compared to placebo group.^{10,12,18,19} According to similar study, patients receiving corticosteroids experienced pain relief significantly earlier, with a mean onset of relief at 6.3 hours sooner than those not receiving corticosteroids (p>0.001).¹⁰ Due to potent anti-inflammatory action of prednisolone there is fast resolution of pain.¹² Time until complete pain relief was 42.6±6.44 hours in Group A and 58.71±17.19

hours in Group B ($p < 0.001$). In the study done by Hayward G et al., time to complete resolution ranges from 15 to 45 hours in the corticosteroids used group and 35 to 50 hours in placebo groups.⁸ According to O'Brien et al., patients treated with steroids experienced pain relief significantly sooner than those receiving a placebo, with an average time to pain relief of 15 ± 11 hours compared to 35.4 ± 17.9 hours for the placebo group ($p < 0.002$)¹⁶ which matched our study. A meta-analysis of eight RCT showed significant faster reduction of pain or complete pain relief from steroid use compared with placebo²⁰ and this support our study. According to a study corticosteroid, when combined with antibiotics, provide symptomatic relief and faster recovery for both adults and children with severe or exudative sore throat caused by GABHS. In children showing severe symptoms and confirmed bacterial pathogens via rapid streptococcal tests, a single dose of oral dexamethasone is considered a safe and effective adjunctive treatment alongside antibiotics²¹. No adverse side effect from steroid administration was observed in this current study. Wei et al. reported a case of hiccups linked to short-term oral steroid use¹⁹, which is generally considered safe. However, there are reports of associated risks such as vascular necrosis and rare fatal varicella zoster in immunocompetent patients²². Additionally, severe mood changes and psychotic reactions can unpredictably occur²², though these risks are more pronounced with long-term, high-dose steroid therapy.

CONCLUSION

In adult patients with acute sore throat due to acute tonsillitis and/or acute pharyngitis, single dose of oral prednisolone was effective in reducing pain as well as shortening the duration of pain. So, in addition to the use of regular medicines, single dose of corticosteroids use can enhance earlier recovery from pain and relief discomfort.

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CONFLICT OF INTEREST

The author(s) declare that they do not have any conflicts of interest with respect to the research, authorship, and/or publication of this article.

AUTHOR CONTRIBUTIONS

NR: Concept of research, Writing the article, Analysis of data and interpretation; SKS: Collection of data; Tracing the patient. PT: Manuscript draft and finalization. All authors read and approved the final manuscript.

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