

# Comparison of Effectiveness of Topical Steroid Versus Systemic Steroid in Nasal Polypi

Muhammad Umar, Muhammad Arshad, Sadia Chaudhry, Zafar Ahmed

Department of ENT, Fauji Foundation Hospital, Rawalpindi

## Abstract

**Background :** To compare the effectiveness of topical steroid and oral steroid in reducing size of polyps and improving patency of nasal air way.

**Methods:** In this randomized controlled trial a total of 140 patients were taken with bilateral nasal polypi. They were divided in 2 groups. Group A (70) were given topical steroids and Group B (70) were given oral steroids. Patients aged above 15 years of both genders with bilateral nasal polypi of stage 2 and 3 were included. Anterior rhinoscopy was done with the help of head-light. Patency was noted of both nostrils using nasal speculum. Endoscopic staging was done at the same time. Size was assessed with rigid endoscope as it can diagnose small polyps in the middle meatus. Both groups were examined again in follow up by anterior rhinoscopy and then by endoscope to see the stage of polyps. Chi square test were applied for comparison of efficacy. p value  $\leq 0.05$  was considered significant.

**Results:** Mean $\pm$ SD of age (yrs) of patient in Group A and Group B were  $43.71\pm 10.756$  and  $42.77\pm 12.238$  respectively. Chi-square test was applied to compare the efficacy (right nostril and left nostril) in both the groups which was statistically significant (p-value 0.009 and 0.005) which showed that topical steroid was more effective than systemic steroid in treating nasal polyps.

**Conclusion:** Topical steroid is significantly effective than systemic steroid in treating nasal polyps.

**Key Words:** Nasal polyposis, chronic rhinosinusitis  
**Introduction**

The nasal polyp (NP) presents as grape like appearance, having a 'body' and a 'stalk'. The surface is smooth and the colour is more yellow than the pink mucous membrane.<sup>1</sup> NP usually start in the osteomeatal region and block the normal sinus ventilation causing facial and sinus pain. NP affect more men than women and appear in adults aged  $\geq 30-40$  years of age. Endoscopic sinus surgery is frequently used when medical therapy is failed.<sup>2</sup> The

estimated prevalence of this condition is between 1% and 4%.<sup>3</sup> Chronic rhinosinusitis with NP is a common health problem, affecting 2% to 5% of the general population.<sup>4</sup> European guidelines recommend intranasal corticosteroids as first line treatment for chronic rhinosinusitis with nasal polyps, oral steroid therapy for patients with severe or uncontrolled symptoms and endoscopic sinus surgery for patients with inadequate improvement despite oral steroid therapy.<sup>5</sup> Oral steroids 25mg prednisolone are given daily for 10-14 days.<sup>1</sup> Intranasal steroids will not eliminate polyps, as only a small fraction of the spray reaches the middle meatus.<sup>1</sup> Benitez and colleagues used prednisolone, 30 mg/d, tapered over 2 weeks; Hissaria and colleagues used prednisolone, 50 mg /d for 2 week without tapering.<sup>5</sup> Vaidyanathan and colleagues reported a randomized, double blind, placebo-controlled trial. Sixty patients with nasal polyps received oral prednisolone, 25mg/d for 2 weeks, or placebo followed by treatment in both groups with fluticasone propionate nasal spray(200 $\mu$ g twice daily) for 8 weeks and fluticasone propionate nasal spray (200 $\mu$ g twice daily) for 18 additional weeks.<sup>5</sup> Topical corticosteroid administration generally causes fewer adverse effects than systemic corticosteroid use because the topical corticosteroids has limited bioavailability.<sup>6</sup> Topical and oral steroids are considered the first line treatment of chronic rhinosinusitis with and without NP.<sup>7</sup> The rate of success of NP treatment with a topical corticosteroid ranges from 60.9 to 80%.<sup>8</sup> A retrospective study evaluating a short course oral prednisolone followed by daily intranasal steroid showed this treatment to be effective in 85% of patients with only 15% of patients requiring endoscopic sinus surgery.<sup>9</sup>

NP are benign lesions arising from the mucosa of the nasal sinuses (commonly at the outflow tract of one or more of the sinuses) or from the mucosa of the nasal cavity. Having an uncertain etiology and a tendency to recur, they represent a challenging diagnosis for the physician to treat. Management of NP forms a large part of the workload for the otolaryngologist, especially for those with an interest in rhinology.<sup>10</sup>

## Patients and Methods

This randomized controlled trial study was conducted in ENT department Fauji Foundation Hospital Rawalpindi from Jan,2012 to June,2013. A total of 140 patients were taken with bilateral nasal polypi. They were divided in 2 groups. Group A (70) were given topical steroids and Group B (70) were given oral steroids. Sample size was calculated by using WHO sample size calculator and level of significance was 5%. Consecutive non-probability sampling technique was used. Patients aged above 15 years of both genders with bilateral nasal polypi of stage 2 and 3 (mentioned below) were included in the study. Patients with unilateral polypi and having comorbidities like diabetes and hypertension were excluded from the study. An informed consent was obtained from all patients prior to using their data in research. Anterior rhinoscopy was done with the help of head light. Patency was noted of both nostrils using nasal speculum. Endoscopic staging was done at the same time. Size was assessed with rigid endoscope as it can diagnose small polyps in the middle meatus. It is not only useful for the diagnosis but also for follow up examination and for staging the disease(Table 1).<sup>1</sup>

**Table 1: Nasal polyps- Endoscopic staging**

Endoscopic Findings	Stage
No polyp	0
Restricted to middle meatus	1
Below middle turbinate	2
Massive polyposis	3

Fluticasone propionate (flimonase) nasal spray two puffs per nostril twice daily for four weeks were given to group A. 30mg of prednisolone for four weeks (three tablets BD) were given to group B. Group A and B were followed up after four weeks. Both groups were examined again in follow up by anterior rhinoscopy and then by endoscope to see the stage of polyps. Patients were examined and findings were confirmed by senior or/and supervisor. Nasal patency was checked by nasal speculum. Chi square test was applied for comparison of efficacy. p value  $\leq 0.05$  was considered significant.

## Results

Total 140 patients were examined having bilateral nasal polypi during the time period under study. The age of the patients ranged from 16 to 63 years (Mean :43.71+10.756 years) in Group A and 17 to 65 years (Mean :42.77+ 12.238 years) in Group B. Both the

groups had males (22.9%) and females(77.1%) respectively. Endoscopic staging (post treatment) showed stage 3 for right nostril in group A was 34.3% and in Group B it was 14.3%. Similarly in left nostril stage 3 nasal polyp in Group A was 32.9% and in Group B it was 14.3%. Nasal polypi stage 2 observed in Group A on right side was 22.9% and 14.3% in Group B and on left side it was 21.4% in Group A and 14.3% in Group B. Chi Square test was applied to compare the efficacy of the treatment. Comparison of post treatment improvement in patency showed 61.4% & 81.4% respectively (Table 2&3).Chi square test was applied to compare the efficacy which was statistically significant (p-value 0.009) which showed topical steroid were more effective than systemic steroids for right nostril. Similarly for left nostril Chi square test was statistically significant (p-value 0.005) giving the same results (Table 1-3).

**Table 2 : Comparison of Post Treatment Endoscopic Staging (right nostril)**

Post-treatment endoscopic staging (right nostril)	Groups	
	Flixonase	Oral prednisolone
No polyp	0(0.0%)	16(22.9%)
Restricted to middle meatus	30(42.9%)	34(48.6%)
Below middle turbinate (right nostril)	16(22.9%)	10(14.3%)
Massive polyposis	24(34.3%)	10(14.3%)
Total	70(100.0%)	70(100.0%)

**Table3:Comparison of post treatment endoscopic staging (left nostril)**

Post-treatment endoscopic staging (left nostril)	Groups	
	Flixonase	Oral prednisolone
No polyp	0(0.0%)	16(22.9%)
Restricted to middle meatus	32(45.7%)	34(48.6%)
Below middle turbinate	15(21.4%)	10(14.3%)
Massive polyposis	23(32.9%)	10(14.3%)
Total	70(100.0%)	70(100.0%)

## **Discussion**

Chronic rhinosinusitis is an inflammatory disease of the nasal and paranasal sinuses that is present for more than three months, and is associated with inflammatory changes ranging from polypoid mucosa to gross nasal polyp.<sup>11</sup> The reported prevalence of NP varies between 0.2% and 4.3% of the population, and Larsen and Tos estimated an incidence of 0.627 per thousand per year in Denmark in symptomatic patients.<sup>12</sup> The word polyp is derived from Greek, meaning many footed (poly, many; pous, footed) but a polyp has only one foot(stalk).<sup>13</sup> Nasal polypi should probably be considered as one form of chronic inflammation in the nose and sinuses, i.e. part of chronic rhinosinusitis.<sup>14</sup> They are frequently observed in chronic rhinosinusitis, including allergic rhinosinusitis, and other chronic sinonasal inflammatory states.<sup>15</sup>

NPs are the common end-point of a number of conditions characterized by inflammation and are rarely 'curable' in its true sense. After consideration of the underlying etiology and confirmation of the diagnosis, they are normally managed by a combination of medical and surgical interventions. Surgical options include polypectomy and functional endoscopic sinus surgery (FESS). While in medical treatment topical corticosteroids have proved to be the treatment of choice. The efficacy of topical corticosteroids such as betamethasone sodium phosphate nasal drops, beclomethasone dipropionate, fluticasone propionate and budesonide nasal sprays in reducing polyp size and rhinitis symptoms has been demonstrated in several randomized, placebo-controlled trials.

Topical corticosteroid spray is usually administered by nasal inhalation using a metered-dose nasal spray pump.<sup>16</sup> If used once daily, it is administered preferably in the morning<sup>17</sup>. Generally, therapy is initiated with once-daily dosing; some patients may obtain greater relief with twice-daily divided dosing.<sup>16</sup> However these nasal sprays have their own side effects. Mild, transient nasal burning and stinging, after-taste, epistaxis, headache, nausea, vomiting, abdominal bloating, pharyngitis, cough and asthma are most common.<sup>16-19</sup>

NPs usually start in the osteomeatal region and block the normal sinus ventilation causing facial and sinus pain, infection and increasing nasal obstruction as they grow and protrude down and forward into the nasal passages. Because the pathway that leads to the formation of sinonasal polyps has not been completely

elucidated, effective long-term treatments remain difficult to pinpoint.

Management of these polyps, therefore, is a difficult challenge for the contemporary otolaryngologist. As per classical teaching ethmoidal polyps are more commonly seen in adults and elderly people and they are usually bilateral. They affect more men than women and typically appear in adults. Endoscopic sinus surgery is frequently used when medical therapy is insufficient.

In our study the age of patient in Group A (flixonase) with ranges from 16 years to 63 years, whereas in group B (oral prednisolone) with ranges from 17 years to 65 years. Distribution of gender (male & female) were also calculated in both the groups in which frequency and percentages of male patients in both the groups were 16 (22.9%) and 16 (22.9%) respectively, whereas female patients in both the groups were 54 (77.1%) and 54 (77.1%) respectively.

Endoscopic staging (post-treatment) to see the polyps was also calculated in both the groups in right nostril. There were 04 stages of endoscopic stages which were seen in which frequency and percentages of restricted to middle meatus in both the groups were 30 (42.9%) and 34 (48.6%) respectively. Similarly massive polyposis in both the groups were 24 (34.3%) and 10 (14.3%) respectively, where no patient was appear with 'no polyp' in group A and 16 (22.9%) with 'no polyp in group B.

Endoscopic staging (post-treatment) to see the polyps was also calculated in both the groups in the left nostril in which frequency and percentages of restricted to middle meatus in both the groups were 32 (45.7%) and 34 (48.6%) respectively. Similarly massive polyposis in both the groups were 23 (32.9%) and 10 (14.3%) respectively, where no patient was appear with 'no polyp' in group A and 16 (22.9%) with 'no polyp in group B. Patency was restored in 42 (60%) patients in group A and 57 (81.4%) patients in group B. In our study, the female patients were more in number as compared to male patients because of the fact that female patients are entitled in our study place at Fauji Foundation Hospital Rawalpindi while male patients have entitlement in Military Hospital Rawalpindi except for non pensioners patients and Foundation employees. In topical group no patient had reduced to stage 0 while in oral steroid group 16 patients were reduced to stage 0. This is most probably because topical steroid cannot reach the middle meatus properly. Total 23 patients did not respond to topical steroid in stage 4 while total of 10 patients did not

respond to treatment in stage 4, so topical steroid is less effective in massive polyposis.

Although topical steroids are usually applied via nasal spray, one paper has demonstrated efficacy of manual application directly into the frontal sinus; many other rhinologists have begun to advocate the off-label use of stronger steroids such as Pulmicort for use in nasal washes or applied directly as nasal drops<sup>20</sup>. In one study systemic steroids were shown to be more potent and more effective in decreasing polyp eosinophilia when compared with steroid sprays.<sup>21</sup>

## Conclusions

1. Topical steroids are significantly effective than systemic steroids in treating nasal polyps.
2. Intransal steroids will not eliminate polyps, but the treatment clearly reduces their size. On the other hand, an effect on polyps in the middle meatus cannot be expected as only a small fraction of the spray reaches the middle meatus.

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