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A study on the use of perioperative steroid therapy to treat Sinonasal polyposis in surgical patients

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Abstract
Background: The main cause of chronic rhinosinusitis is inflammation, which can be managed with a number of medications, including topical corticosteroids, systemic steroids, antibiotics, and saline irrigations.
Methods: This study was conducted at the ENT Department of GSL Medical College in Rajamahendravaram, Andhra Pradesh, India, between April 2015 and March 2016. Forty individuals with chronic rhinosinusitis and sinonasal polyposis are examined in this study. During surgery, 25 patients received systemic steroids, while the remaining 25 patients received placebos. Critical data analysis was performed on both clinical and operational data.
Results: For patients getting ESS for the treatment of CRSwP, this study assesses the effect of systemic steroids both before and after surgery on surgical results. The trial is double-blind and placebo-controlled. We employed both subjective and objective success metrics. The primary objective of the study was to determine the effects of steroid use on these subjective and objective well-being indicators.
Conclusion: Additionally, postoperative problems like scarring, the formation of synechiae, postoperative crusting, and recurrence can be avoided with the use of adjuvant steroids administered during surgery.

Keywords: Sinonasal, polyposis, adjuvant steroid, scarring, synechiae formation

Introduction
Sinonasal polyposis causes chronic rhinosinusitis, which leads to missed work days and a significant rise in direct medical care costs. Inflammation plays a major role in the pathogenesis of Chronic RhinoSinusitis (CRS), a condition that has several medical treatment options [1–5]. Systemic steroids, antibiotics, and saline irrigations are all included in this category. Even with the strongest medication, it is impossible to treat every patient or control every symptom. This is an unfortunate reality of life. When drug therapy fails to control symptoms, endoscopic sinus surgery (ESS) has been demonstrated to improve quality of life and alleviate symptoms [6, 7].
Although there is some debate regarding whether or not this is the best or most appropriate surgical procedure, the majority of surgeons will advise polypectomy, complete ethmoidectomy, and middle meatal antrostomy for patients with Chronic Rhinosinusitis with Sinonasal Polyposis (CRSwP) [8–10]. This can be done with or without a frontal sinusotomy or sphenoidotomy. However, there is a noticeable lack of uniformity and rules regarding the drug regimen administered to patients undergoing ESS for CRSwP both before and after surgery, as well as the care of these patients.
For instance, due to the benefits they offer following surgery, several surgeons recommend preoperative systemic steroids. These benefits include reduced edema, polyp burden, and blood loss. Steroids used during surgery are usually thought to offer a number of possible benefits that enhance outcomes and rehabilitation. These benefits include a reduction in intrinsic inflammatory disease and scarring and postoperative edema. Systemic steroids have been shown to have a wide variety of possible adverse effects, from mild ones like gastrointestinal distress to severe ones like femoral head osteonecrosis [11]. These ramifications are all relevant to the current debate. One of the most common adverse effects of systemic steroids is gastrointestinal distress [12–15].

The primary objective of this study is to investigate the subjective and objective effects of endoscopic sinus surgery (ESS) in treating sinusitis with pneumonia (CRSwP) and chronic rhinosinusitis in patients who have received peri-operative systemic corticosteroids. The Lund-Sinus McKay Symptom Questionnaire (SSQ) is one tool used to evaluate feedback from patients. The Lund-Kennedy Endoscopy Scale (LKES) is used to give a numerical depiction of the level of progress. This enables us to deconstruct the main purpose of the study into its three subgoals, each of which is explained below.

Materials and Methods

This study was conducted in the ENT department of GSL Medical College in Rajamahendravaram, Andhra Pradesh, India, between April 2015 and March 2016. Forty individuals with chronic rhinosinusitis and sinonasal polyposis are examined in this study. During surgery, 25 patients received systemic steroids, while the remaining 25 patients received placebos. Critical data analysis was performed on both clinical and operational data.

Patients having a diagnosis of CRSwP participated in the trial. Patients with Chronic Rhinosinusitis in this section of the population are notoriously difficult to treat; after surgery, both objective and subjective symptoms frequently return. Before, during, or after surgery, certain surgeons may also administer systemic steroids to this subgroup of patients.

Inclusion Criteria

1. The chance to participate in the study was extended to adult patients (over the age of 18) who were scheduled to receive ESS for the treatment of their ailment.
2. The maximum age was 60.

Exclusion Criteria

1. Age 18 years
2. Age of at least 60
3. People with Type 3 Diabetes
4. Hypertensive patients
5. Individuals with mucociliary problems and immunocompromised state were excluded.
6. The study excluded patients with allergic fungal rhinosinusitis (AFRS).

To evaluate the impact of systemic steroids given during surgery on the recovery of CRSwP patients, a randomized, placebo-controlled research was created. A patient was randomly assigned to receive systemic steroids or a placebo for seven days prior to surgery and for fourteen days following surgery, after which the steroids were gradually tapered down. This was done once the patient's eligibility for the trial was determined. The dosage was thirty milligrams, given once daily with breakfast. Any potential short-term adverse effects were deemed tolerable, and the modest dosage used in this study was expected to offer adequate therapeutic activity. On the outside, the multivitamin pills that were used as the placebo and the real drug looked exactly alike. After surgery, patients continued taking the medicine for two weeks. Topical steroids were administered to the patients and the placebo group after surgery. Post-operative observation lasted six months.

First, information was obtained on the intricacy of the procedure and the condition of the sinonasal mucosa. Subjective evaluation of the disease's impact on the patient and objective data from nasal endoscopy were shown to be two additional relevant outcomes in terms of postoperative information.

The amount of time it took and the expected blood loss were documented. The condition of the nasal mucosa and turbinate was also taken into account before surgery. This evaluation was made using a three-point rating methodology. The surgeon next makes an estimate of how many sinuses will be opened and how much illness will be eliminated.

Results

For patients getting ESS for the treatment of CRSwP, this study assesses the effect of systemic steroids both before and after surgery on surgical results. The trial is double-blind and placebo-controlled. We employed both subjective and objective success metrics. The primary objective of the study was to determine the effects of steroid use on these subjective and objective well-being indicators.

Because they will make surgery easier, preoperative systemic steroids are commonly administered by patients undergoing ESS for the treatment of CRSwP. Benefits include decreased blood loss, better vision, and less tissue stress. In an area where "best practices" are sometimes arbitrary and unequal, this study aimed to provide more data. The study's conclusions show that there are differences in surgical technical difficulty and that these differences have therapeutic implications.

Table 1: Duration of Surgery

Test	minimum	42
	maximum	122
	median	62
Control	minimum	57
	maximum	132
	median	57

Steroids used before, during, and after surgery have considerably decreased surgical blood loss. The active group experienced an average blood loss of 128 milliliters, while the placebo group saw an average blood loss of 164 milliliters. Table 1 suggests that the bloodless field may have had a substantial effect on the overall effectiveness of the surgical process. According to the table below, just 28% of the surgical test group experienced considerable blood loss, compared to 64% of the placebo group.

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Table 2: Data on the Blood loss

Test/control			**Frequency**	**Valid %**	**Cumulative %**
Test	Valid	100	18	72.0	72.0
		200	7	28.0	28.0
		Total	25	100.0	
Control	Valid	100	8	32.0	32.0
		200	17	68.0	68.0
		Total	25	100.0	

Because these differences were considered clinically significant, they may have increased the operational efficiency of the test group. Steroids' anti-inflammatory qualities are demonstrated by the significant improvement in sinonasal polyposis in these patients. It should be noted that only in situations where steroids were given perioperatively

was the highest level of disease clearance possible. Every patient in the test group had healthy maxillary, ethmoid, frontal, and sphenoid sinuses.

Table 3: Number of Sinuses opened

Test/control			Frequency	%	Valid Percent	Cumulative %
test	Valid	10	20	100.0	100.0	100.0
control	Valid	4	14	56.0	56.0	56.0
		6	8	32.0	32.0	32.0
		8	3	12.0	12.0	12.0
		Total	25	100.0	100.0	100.0

Regarding the disease clearance seen in the remaining patients in the placebo group, the surgeon was not happy. Due to extensive bleeding and poor lighting, doctors could only access the maxillary and ethmoid sinuses. It's also important to highlight the connections between factors like surgical time, blood loss, mucosal health, and disease clearance. The test group's median score for facial discomfort was much lower than that of the placebo group. Additionally, the nasal drainage median score might vary. The experimental group consists of four people, while the control group consists of eight people. The headache median score is the only symptom score in which there is no appreciable difference between the test group and the placebo group. The active group consists of four people, while the placebo group consists of five. This can be the result of several factors that cause headaches coming together. Additionally, there is a statistically significant difference between the groups in the total symptom score.

Table 4: Data on Recurrent polyps

Test/control			Frequency	Percent	Valid %	Cumulative Percent
test	Valid	absent	20	80.0	80.0	80.0
		mild	05	20.0	20.0	20.0
		Total	25	100.0	100.0	
control	Valid	absent	18	72.0	72.0	72.0
		mild	7	28.0	28.0	28.0
		Total	25	100.0	100.0	

At six months, the risk of recurrence was evaluated. A follow-up endoscopic check after two years might make it more valuable. Due to the disease's partial elimination, the placebo group saw a greater recurrence rate, as seen in Table 4.

Discussion

Endoscopic polypectomy is used to treat patients with chronic rhinosinusitis and sinonasal polyposis. This has been demonstrated time and time again over a long period of time. The proper use and dosage of corticosteroids, however, have long been a topic of discussion. This controversy is the main focus of this investigation. In this trial, oral prednisolone pills were used to deliver systemic steroids. A depot injection contains approximately 100 mg of the glucocorticoid prednisolone. For three weeks, take 30 mg of prednisolone orally daily. Unfortunately, there aren't any controlled dose-effect studies available at the moment [15, 12-14].

Regarding Lildhol, pharmaceutical polypectomy can be equally as effective as snare-based polypectomy provided systemic steroids are administered for a brief duration. The earlier claim is likewise supported by this investigation. Steroid use prior to endoscopic surgery can greatly improve surgical results for patients with serious diseases. This is what the study has shown. In patients with advanced illness, the potential benefits of the treatment may outweigh the low risk of serious side effects [17–19].

Intranasal steroids seem to be the most successful treatment for sinonasal polyposis, according to the material currently in publication. Thus far, at least sixteen randomized controlled trials (RCTs) have demonstrated a significant benefit over placebo. Topical steroid treatment does not work for every patient. This could happen because a badly blocked nose prevents the spray from circulating evenly throughout the nasal passages. In terms of endoscopic polypectomy, this is the true gold mine [18].

Although intranasal and systemic steroid therapy may not completely remove polyps, it will undoubtedly lessen their size and mucosal inflammatory activity, making surgery easier. However, just a small amount of spray reaches the middle meatus, so we shouldn't expect any effect on polyps there. To ensure that the sinuses get enough air, these crucial locations must be opened during surgery. In this trial, the placebo group had fewer surgically opened sinuses than anticipated, whereas the prednisolone group did not have this impact. The surgeon pointed out that rather than the absence of disease in the sealed sinuses, the discrepancy was due to technical limitations, namely in relation to sight and bleeding. The surgical evaluation of the sinonasal mucosa revealed a statistically significant difference between the two groups; the test group experienced significantly fewer incidences of friable and irritated mucosa than the placebo group [19, 20].

Topical steroids reduce the risk of polyp recurrence following polyp ectomy surgery, according to controlled research. However, in cases of severe inflammation, the results are only temporary. Many inferences relevant to the research goals can be drawn from the data collected and analyzed in this study. First off, preparation with systemic steroids appears to be able to facilitate surgery by reducing bleeding during the procedure, enhancing the health of the sinonasal mucosa, and curing the illness. As a result, there is enough data in the context of evidence-based care to recommend that all patients having ESS for CRSwP get systemic steroids before surgery.

Second, for postoperative symptoms like headache, facial pain, nasal discharge, loss of smell, nasal blockage, and general discomfort, systemic steroids are an excellent option. Third, early post-operative systemic steroid administration results in shorter-term benefits in sinus health if the ultimate goal of sinus surgery for these individuals is to create an endoscopically healthy sinonasal cavity. Therefore, there is evidence to support the use of systemic steroids in the postoperative period to optimize the initial endoscopic appearance of the cavities in the practice of surgeons who provide intensive postoperative care for patients after ESS, including debridement and medical therapy based on the endoscopic findings [21, 22].

Conclusion

Finally, postoperative problems include crusting, the formation of synechiae, and scarring can be less common if adjuvant steroids are used prior to surgery. Additionally, this reduces the likelihood of a recurrence.

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