



## ROLE OF CRYOCAUTERIZATION IN VASOMOTOR RHINITIS

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**ABSTRACT****Objective** To assess the efficacy and morbidity of cryocauterization of the turbinates in patients with nasal obstruction caused by turbinate hypertrophy.**Methods** Sixty patients (age range, 23–67 y; median age, 42 y) enrolled in the study. All the patients had nasal blockage. 30 were given medical treatment. In other 30, Cryocauterization of the turbinates done. The preoperative and postoperative nasal functions were investigated by immediate and long-term visual analogue scale (VAS) scores of symptom parameters, saccharine transit time and acoustic rhinometry. The follow-up was conducted at 1 week and 3 months.**Results** The VAS scores of subjective complaints (nasal discharge, itching, sneezing, crusting) decreased, and the VAS scores of evaluation of the effectiveness (frequency of nasal obstruction, and patient satisfaction) increased statistically significantly in the 3-month follow-up without relapses. There were no adverse effects on olfactory functions. In acoustic rhinometry the change in the sum of both nasal cavity volumes from nostril to 5 cm was statistically significant 3 months after the treatment.**Conclusion** The cryocauterization of turbinates is a promising alternative, which should be considered when planning turbinate interventions. The cryocauterization of turbinates is a promising alternative, which should be considered when planning turbinate interventions. Newer trends also recommend diathermy ablation of turbinates as a promising alternative.**KEYWORDS** : cryocauterization , turbinates , acoustic rhinometry , saccharine transit time**INTRODUCTION**

Nasal allergy is a common problem difficult to treat. Most of the chronic patients feel frustration even after completing all conventional modalities of treatment. Rhinitis is a significant cause of widespread morbidity, medical treatment costs, reduced work productivity and lost school days. Although sometimes mistakenly viewed as a trivial disease, symptoms of allergic and non-allergic rhinitis may significantly impact a patient's quality of life, by causing fatigue, headache, cognitive impairment and other systemic symptoms. In addition, many antihistamines commonly used for treatment can themselves cause performance impairment that may contribute to fatal automobile accidents, work place accidents, decreased work productivity and in children, impaired school performance.

Appropriate management of rhinitis may be an important component in effective management of coexisting or complicating respiratory conditions, such as asthma, sinusitis, or chronic otitis media. Rhinitis may be caused by allergic, non-allergic, infectious, hormonal, occupational, and other factors. Defining the causes of rhinitis in an individual is important because different rhinitis syndromes may require different therapeutic approaches for optimal management, an important consideration as more treatment options become available.

We have used cryosurgery as an alternative mode of treatment for providing the permanent relief with regards to this disease. Cryosurgery basically freezes and debulks the hypertrophied turbinates as well as the destroys the autonomic innervation, by a cryoprobe.

**METHODOLOGY**

The study was conducted in the Department of ENT at LN Medical College Bhopal from October 2017 to February 2018. The study subject were selected from patients in the opd and admitted in wards.

**Study population** The study population consisted of all the adult patients with clinical and laboratory diagnosis of nasal obstruction.

**Study Design** Prospective, nonrandomized study and outpatient treatment.

**Inclusion Criteria** The study population consisted of all the adult patients with clinical and radiological diagnosis of nasal obstruction. ASA 1 & 2 without any systemic illness.

**Exclusion criteria** were as follows: Patients with history of cardiovascular disease, respiratory disease, liver or renal dysfunction, psychiatric illness etc.

Through pre-anesthetic checkup of all the patients were carried out, routine and special investigations were carried out, routine and special investigations were advised as required. Details of the procedure were explained to the attendants of the patients and informed consents were obtained. All the patients kept nil orally as required as per the age.

The patients were randomly divided into two groups

Group I : 30 patients were given medical treatment, nasal spray etc.

Group II: 30 patients Cryocauterization of the turbinates done

**Method:** All of the patients who participated in the trials had a diagnosis of VMR, symptoms for at least 1 year, negative skin tests for a mixed panel of seasonal and perennial allergens, and a nasal cytology examination negative for eosinophils.

Patients of group 2 were taken on operation table and then pulse rate, blood pressure, respiratory rate, SPO<sub>2</sub>, degree of sedation were recorded. A 22 gauge intravenous cannula was established and connected to the infusion of a crystalloid solution. Premedication was done uniformly to all the patients. Reactions of patients on surgical stimulation were noted. Then surgeon was asked to start the procedure. The vital parameters like pulse rate, blood pressure, respiratory rate, SPO<sub>2</sub> were recorded.

**OBSERVATION TABLES****TABLE NO.-1 AGEWISE DISTRIBUTION CASES**

S. No.	Age (years )	Group I		Group II	
		No.	%	No.	%
1	25-35	13	43.0	13	43.0
2	36-45	9	30.0	10	33.0
3	45 and above	8	27.0	7	24.0

The above table shows that the maximum number of patients were in the age groups of 25 -35years and found to be 13 (43.0%) and also 13 (43.0%) in group I and II.

**TABLE NO. 2 GRADATION OF RESPONSE ON OLFACTORY FUNCTIONS[AT 6 WEEKS]**

Response	GROUP 1		GROUP 2	
	No.	%	No.	%
Excellent	4	45	17	30
Good	4	30	11	36.7
Fair	9	10	2	20
Poor	13	15	0	13.33

Gradation of response was done based on subjective relief, after therapy. Most of the patients showed excellent response to the therapy.

**TABLE NO.3 AVERAGE SACCHARINETRANSITTIME IN MINUTES**

No. of patients	Before any therapy	After medical management	Follow up After medical management	After cryoablation	Follow up After cryoablation
GROUP 1 N=30	38min	39min	38.5min		
GROUP 2 N=30	38.5min			42min	42.5min

**TABLE NO.4 PERCENTAGE INCREASE IN ACOUSTIC RHINOMETRY [SUM OF BOTH NASAL CAVITY VOLUMES]**

No. of patients	After medical management	Follow up After medical management	After cryoablation	Follow up After cryoablation
GROUP 1 N=30	8%	8%		
GROUP 2 N=30			25%	30%

**TABLE NO.5 RESULT AT FOLLOW-UP[AT 3 MONTHS]**

Result	GROUP 1		GROUP 2		
	No.	%	No.	%	
Cured	08	26.7%	18	60%	Significant
Relieved	12	40%	10	33.33%	Significant
Unrelieved	10	33.33%	02	6.67%	Not significant

**RESULTS**

The VAS scores of subjective complaints (nasal discharge, itching, sneezing, crusting) decreased, and the VAS scores of evaluation of the effectiveness (frequency of nasal obstruction, and patient satisfaction) increased statistically significantly in the 3-month follow-up without relapses. There were no adverse effects on olfactory functions. In acoustic rhinometry the change in the sum of both nasal cavity volumes from nostril to 5 cm was statistically significant 3 months after the treatment.

Significant improvement was observed within the first week and improvement in all symptoms favored treatment with azelastine nasal spray. No serious or unexpected adverse events were reported in either study. Bitter taste (19% vs 2%) was the only adverse experience that occurred with a statistically significantly greater incidence in the azelastine group than in the placebo group. But symptomatic and clinical relief was much better in surgical group that is cryotherapy group.

**STATISTICAL ANALYSIS**

Data was analyzed using SPSS 20 statistical package. A descriptive analysis was done on all variables to obtain a frequency distribution. The mean + SD and ranges were calculated for quantitative variables. Continuous variables were compared by the Student t test. Proportions were analyzed with the chi-square test. A 'P value' of 0.05 or less was considered statistically significant

**DISCUSSION**

Nasal allergy is a common problem difficult to treat. Most of the chronic patients feel frustration even after completing all conventional modalities of treatment. Rhinitis is a significant cause of widespread morbidity, medical treatment costs, reduced work productivity and lost school days. Although sometimes mistakenly viewed as a trivial disease, symptoms of allergic and non-allergic rhinitis may significantly impact a patient's quality of life, by causing fatigue, headache, cognitive impairment and other systemic symptoms. In addition, many antihistamines commonly used for treatment can themselves cause performance impairment that may contribute to fatal automobile accidents, work place accidents, decreased work productivity and in children, impaired school performance. Appropriate management of rhinitis may be an important component in effective management of coexisting or complicating respiratory conditions, such as asthma, sinusitis, or chronic otitis media. We have used cryosurgery as an alternative mode of treatment for providing the permanent relief with regards to this disease. Cryosurgery basically freezes and debulks the hypertrophied turbinates as well as the destroys the autonomic innervation, by a cryoprobe at 90°C. This study comprises 104 patients of Allergic Rhinitis.

Similar study was done by Varshney S, Chandra K who studied the role of cryosurgery in allergic rhinitis. The patients were followed up for an average period of 3–6 months and the response was evaluated in term of relief in three basic clinical presentation namely Rhinorrhoea, Nasal-obstruction and Sneezing. Complete cure was obtained in 40.4% cases, Moderate improvement in two of the features) in 30.87% cases and satisfactory results in 19.27% cases were observed. Only 9.67% cases showed no sign of improvement. This results infer that cryosurgery may be prescribed as an effective method of treatment in patients of Chronic Allergic Rhinitis.[1]

Anand CS, Agarwal SR et al did a comparative study of cryosurgery and sub mucous diathermy in vasomotor rhinitis .40 patients of vasomotor rhinitis were taken for study, 20 were treated by Cryosurgery and 20 by sub mucous diathermy. Follow up of cases were done for 6–8 weeks. Cryosurgery was found to be more effective and easy procedure for treatment of vasomotor rhinitis Symptomatic relief was more & for longer period and complications like haemorrhage infection, adhesions, scarring were less in cases treated by Cryosurgery.[2]

Bäck Ij et al did submucosal bipolar radiofrequency thermal ablation of inferior turbinates and did a long-term follow-up with subjective and objective assessment. Their objective was To assess the efficacy and morbidity of bipolar radiofrequency thermal ablation of the inferior turbinates in patients with nasal obstruction caused by turbinate hypertrophy. It was a Prospective, nonrandomized study and outpatient treatment. The preoperative and postoperative nasal functions were investigated by immediate and long-term visual analogue scale (VAS) scores of symptom parameters, olfactory thresholds, saccharine transit time, rhinomanometry, and acoustic rhinometry. The follow-up was conducted at 1 week and 3, 6, and 12 months. The difference between the preoperative and postoperative vasoconstrictive effect was not statistically significant. The bipolar radiofrequency thermal ablation of inferior turbinates is a promising alternative, which should be considered when planning inferior turbinate interventions. This was very much similar to our study.[3]

Mullarkey MF et al did their work on allergic and nonallergic rhinitis and their characterization with attention to the meaning of nasal eosinophilia. They examined the differences between allergic and nonallergic rhinitis. One hundred forty-two patients were evaluated. Forty-eight patients were diagnosed as having allergic rhinitis (AR) on the basis of histories correlating with skin tests and markedly elevated total serum IgE levels. Forty-two percent of these

patients had nasal eosinophilia ( $\geq 25\%$ ) and 58% had histories or findings consistent with asthma. Fifty-two individuals had no evidence for immunologic nasal disease, incriminated physical agents as precipitants, and demonstrated no associated respiratory pathology. These patients were classified as having vasomotor rhinitis (VMR). Twenty-one patients had symptoms similar to those of patients with VMR but they demonstrated nasal eosinophilia and were classified as having eosinophilic nonallergic rhinitis (ENR). These patients had a high prevalence of nasal polyps and were significantly more responsive to medical therapy than any group studied. It is concluded that nasal eosinophilia is of little value in the evaluation of AR but provides significant information regarding the therapy and prognosis in nonallergic rhinitis.[4]

Dykwicz MS, Fineman S et al did summary of joint task force practice parameters on diagnosis and management of rhinitis. They inferred that Rhinitis may be caused by allergic, non-allergic, infectious, hormonal, occupational, and other factors. Defining the causes of rhinitis in an individual is important because different rhinitis syndromes may require different therapeutic approaches for optimal management, an important consideration as more treatment options become available. This Executive Summary reviews key points about diagnosis and management of rhinitis contained in the comprehensive document, Diagnosis and Management of Rhinitis: Complete Guidelines of Joint Task Force on Practice Parameters in Allergy, Asthma and Immunology, and Joint Task Force Algorithm and Annotations for Diagnosis and Management of Rhinitis. These documents represent a consensus opinion of the Joint Task Force on Practice Parameters in Allergy, Asthma and Immunology, a national panel co-sponsored by the American Academy of Allergy, Asthma and Immunology, the American College of Allergy, Asthma and Immunology, and the Joint Council on Allergy, Asthma and Immunology.[5]

Banov CH, Lieberman P et al in a very similar study like us studied the efficacy of azelastine nasal spray in the treatment of vasomotor (perennial nonallergic) rhinitis. Azelastine hydrochloride is an antihistamine with anti-inflammatory properties that is available in the United States in a nasal spray formulation for the treatment of seasonal allergic rhinitis. Vasomotor (perennial nonallergic) rhinitis (VMR) is a noninfectious, chronic rhinitis usually not associated with inflammatory cell infiltration. Two multicenter, randomized, double-blind, placebo-controlled, parallel-group clinical trials were conducted to determine whether patients with symptoms of VMR (rhinorrhea, sneezing, postnasal drip, and nasal congestion) could be effectively treated with azelastine nasal spray. All of the patients who participated in the trials had a diagnosis of VMR, symptoms for at least 1 year, negative skin tests for a mixed panel of seasonal and perennial allergens, and a nasal cytology examination negative for eosinophils. After a 1-week, single-blind, placebo lead-in period, patients who met the symptom severity qualification criteria were randomized to receive either azelastine nasal spray (two sprays per nostril twice daily, 1.1 mg/day) or placebo nasal spray for 21 days. Patients recorded the severity of their VMR symptoms on diary cards each morning and evening of the trial using a four-point symptom rating scale (0 = none to 3 = severe). The primary efficacy variable was the overall reduction from baseline in the total vasomotor rhinitis symptom score (TVRSS) over the 21-day, double-blind treatment period. In both studies, azelastine nasal spray significantly (study 1,  $P = .002$ ; study 2,  $P = .005$ ) reduced the TVRSS from baseline when compared with placebo. This is the first demonstration of the efficacy of an antihistamine in the therapy of VMR in two double-blind, placebo-controlled clinical trials.[6]

Bicknell PG. also did work on cryosurgery for allergic and vasomotor rhinitis. The conclusion was that cryo surgery is not the complete answer to the stuffy nose, rhinorrhoea or post nasal drip, but it does offer another simple and relatively inexpensive method as an out-patient treatment, to complement submucosal resection of the septum and submucosal

diathermy. There seems little point in using this procedure where a gross deviation of the septum exists, although it can usefully alleviate symptoms whilst the patient is awaiting in-patient admission for surgery.[7]

Golhar S et al studied the effect of cryodestruction of Vidian nasal branches on nasal mucus flow in vasomotor rhinitis. In their study, 30 patients of vasomotor rhinitis were treated by cryo-destruction of Vidian nasal branches and the success of the treatment was evaluated by an objective parameter i.e. saccharine test done prior and after the cryoapplication. The prolonged saccharine time before the treatment returns to normal after the treatment. In our study also the saccharine time is studied. Gulati M. et al in their study "Evaluation of various methods of treatment of an enlarged inferior turbinate in chronic vasomotor rhinitis" also concluded the same. [8,9]

Cryotherapy has been attempted in the treatment of otolaryngological diseases as in tonsillectomy on patients with blood dyscrasias, in hypophysectomy, nasal bleeding, Meniere's disease, oral ulcerations and hyperkeratoses, juvenile laryngeal papillomata, and chronic rhinitis; and in the curative, palliative and adjunctive treatment of benign and malignant tumours. Its clinical value and indications, however, are so far not fully established. The destruction of cells by freezing is cryotherapy.[10,11,]

## CONCLUSION

Significant improvement was observed within the first week and improvement in all symptoms is seen with treatment with azelastine nasal spray. Bitter taste (19% vs 2%) was the only adverse experience that occurred, but symptomatic and clinical relief was much better in surgical group that is cryotherapy group. The cryocauterization of turbinates is a promising alternative, which should be considered when planning turbinate interventions. Newer trends also recommend diathermy ablation of turbinates as a promising alternative.

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