STUDY OF THE EFFECTS OF SILVER NITRATE IN TREATMENT OF ALLERGIC RHINITISRamya Sablur Narayan¹¹Assistant Professor, Department of Otolaryngology, ESIC-MC-PGIMS, Bengaluru, Karnataka.**ABSTRACT****BACKGROUND**

Rhinitis is defined as the presence of at least one of the following: congestion, rhinorrhoea, sneezing, nasal itching and nasal obstruction. Other reported symptoms include throat clearing, headaches, facial pain, ear pain, itchy throat and palate, snoring and sleep disturbances. Risk factors include an atopic family history, IgE levels above 100 IU/mL before the age of six years, higher socioeconomic status and positive epicutaneous allergen testing.

The aim of this study is to evaluate the efficacy of application of topical 15% silver nitrate solution for treatment of allergic rhinitis.

MATERIALS AND METHODS

A descriptive study of total 100 patients clinically diagnosed with allergic rhinitis presenting with sneezing, rhinorrhoea and nasal obstruction were included in the study. 15% silver nitrate solution was used to cauterize the anterior part of both inferior turbinates and the corresponding parts of the nasal septum over an area of 1 sq. cm. This was repeated for five weeks at weekly interval.

Settings and Design- The study was conducted for a period of one year from Nov 2005 to Nov 2006 at Father Muller Medical College Hospital, Mangalore.

RESULTS

Out of 100 cases, 55% were females and 45% were males. Out of the 100 patients, 89 were male and 16 were female. Their age ranged from 18 - 59 years. We found 73 out of 93 cases improved after five applications of 15% silver nitrate, giving a successful rate of 78.49%.

CONCLUSION

Application of silver nitrate to inferior turbinates for nasal obstruction is effective in upto 78.49% cases. It is well tolerated, carried under local anaesthesia, is cheap and can be carried out at any outpatient clinic with minor side effects.

KEYWORDS

Allergic Rhinitis, Silver Nitrate.

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BACKGROUND

Rhinitis is defined as the presence of at least one of the following: congestion, rhinorrhoea, sneezing, nasal itching and nasal obstruction.^{1,2} Other reported symptoms include throat clearing, headaches, facial pain, ear pain, itchy throat and palate, snoring and sleep disturbances.^{3,4} Risk factors include an atopic family history, IgE levels above 100 IU/mL before the age of six years, higher socioeconomic status and positive epicutaneous allergen testing.¹ Since allergic rhinitis is induced by specific allergens, it makes sense that avoiding those triggers would be an effective treatment. However, this is not always possible as in the case of pollens and for those with mixed allergic and non-allergic rhinitis, avoidance will not completely alleviate their symptoms. All rhinitis symptoms, except for obstruction can be alleviated by H1-antihistamines. Topical H1 antihistamines (Azelastine, olopatadine) provided faster onset of action (less than 15 minutes) and similar to greater efficacy compared to oral

preparations in regard to rhinitis and conjunctivitis. In addition to oral H1-antihistamines, intranasal corticosteroids are the mainstay of treatment. They are the most effective medications for controlling all rhinitis symptoms. Systemic corticosteroids should be considered a last resort treatment option, but they may be necessary for severe or intractable symptoms. Intranasal formulations of cromolyn and nedocromil have been used to treat allergic rhinitis, but are less effective than topical corticosteroids. Subcutaneous immunotherapy (SCIT) has been shown to be effective in treating allergic rhinitis in patients with identifiable IgE mediated symptom triggers. It has some advantages over the above mentioned treatments.

This study was undertaken to evaluate the efficacy of application of topical 15% silver nitrate solution for treatment of allergic rhinitis. This study describes the technique, uses and results obtained following the application of 15% silver nitrate on the inferior turbinate in patients with allergic rhinitis.

MATERIALS AND METHODS

This descriptive study was conducted for a period of one year from Nov 2005 to Nov 2006 at Father Muller Hospital, Mangalore. A total of 100 patients clinically diagnosed with allergic rhinitis presenting with sneezing, rhinorrhoea and nasal obstruction were included in the study.

Before commencing the treatment, a detailed history was elicited from the patients, particularly in relation to the

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duration of disease, previous medication and extent of relief with previous methods of treatment. A meticulous general physical examination was done and this was followed by systemic examination. A thorough ear, nose, throat and head and neck examination was conducted and all the findings were recorded in the proforma. Absolute eosinophil count was done for all the patients included in the study. After the definitive diagnosis, the nose was sprayed with 10% xylocaine. No premedication was used. After five minutes, a swab stick dipped in 15% silver nitrate solution was used to cauterize the anterior part of both inferior turbinates and the corresponding parts of the nasal septum over an area of one sq. cm. This was repeated for five weeks at weekly interval. No other treatment was allowed during this period, except a single tablet of cetirizine on the day of application to alleviate the nasal irritation.

Statistical Analysis

The demographic data, frequency and percentages were calculated with bar diagrams and pie chart. Statistical software- Epi-Info 7.0 was used for computations.

RESULTS

All the patients presented with sneezing and nasal discharge. 90 out of 100 patients had nasal obstruction. Nasal irritation and headache were present in 83% and 23% respectively. Ocular symptoms were present in 10% of cases. The follow-up period varied from one to six months.

Out of 100 cases, 55% were females and 45% were males. The maximum subjects were in the age group of 18 - 29 years 46 (46%) followed by 40 - 59 years 30 (30%), (Figure 1). Sneezing was of the duration of 2 - 5 years in 53%, 6 - 10 yrs. in 34%, 6 months to 1 year in 7%, 11 - 15 years in 3% and less than 6 months in 3% of cases. Nasal discharge was of the duration of 2 - 5 years is 53%, 6 - 10 yrs. in 34%, 6 months - 1 year in 7%, 11 - 15 years in 3% and less than 6 months in 3% of cases. Nasal obstruction was of duration 2 - 5 years in 45% of cases, 6 months - 1 year in 25%, less than 6 months in 12%, 6 - 10 yrs. in 8% of cases, (Table 1). All patients presented with sneezing and nasal discharge. Patients who had 30 or more sneezes per day were selected. This was followed by nasal obstruction in 90% of cases. Nasal irritation was present in 83% of cases. Headache and ocular symptoms in 23% and 10% respectively. Other symptoms like cough, itching and blocking sensation of the ears and wheeze were present in 71% of cases, (Figure 2). The examination findings of these patients revealed pale and oedematous mucosa was seen in 34% of cases, watery discharge was seen in 90% of cases, deviated nasal septum was observed in 51% of cases. Both inferior turbinate were hypertrophied in 64% of cases while unilateral hypertrophy was observed in 28% of cases. In eight cases, no hypertrophy was seen (Figure 3).

The Results of Symptomatic Relief were graded as follows in Case of Sneezes-

- 0 - 5 sneezes per day ✎ good.
- 6 - 10 sneezes per day as ✎ fair.
- More than 10 sneezes per day as ✎ poor.

The best relief obtained was from sneezing with good relief in 80% and fair in 13% of cases. The treatment with 15% silver nitrate solution was effective in relieving rhinorrhoea with good relief in 55% and fair in 38% of cases. The nasal obstruction had good relief in 61% cases and fair in 39%. Headache was relieved in 65% of cases. Ocular symptoms were controlled in 70% of cases. The other symptoms like wheezing, cough, ear itching and blocking sensation of the ears were fairly relieved in 56% of cases, (Table 2). Out of 100 patients, 93 of them attended follow-up regularly and 7 of them discontinued (Figure 4). 73 out of 93 cases improved after five applications with 15% silver nitrate. This gives a successful results of 78.49%. These cases have been followed up for a period ranging from 1 to 6 months (Table 3).

Figure 1. Age and Sex Wise Distribution

Symptoms	1 Month - 6 Months	6 Months - 1 Year	2 Year - 5 Year	6-10 Years	11-15 Years
Sneezing	3	7	53	34	3
Nasal Discharge	3	7	53	34	3
Nasal Obstruction	12	25	45	8	-

Table 1. Distribution of Patients according to Duration of Main Symptoms

Figure 2. Symptom Wise Analysis of Patients

Figure 3. Examination Findings

Symptoms	No. of Cases	Good	Fair	Poor
Sneezing	100	80	13	7
Rhinorrhoea	100	55	38	7
Nasal Obstruction	90	55	35	0
Ocular Symptoms	10	-	7	3
Nasal Irritation	83	30	40	13
Throat Irritation	70	20	30	20
Headache	23	15	8	-
Others	71	20	40	11

Table 2. Shows the Results of Symptomatic Relief of the Patient

Figure 4. Follow-Up of Patients

No. of Cases	Improved	Not Improved
No. of Cases	73	20

Table 3. Results showing Improvement

DISCUSSION

Since allergic rhinitis is induced by specific allergens, it makes sense that avoiding those triggers would be an effective treatment. However, this is not always possible as in the case of pollens and for those with mixed allergic and non-allergic rhinitis, avoidance will not completely alleviate their symptoms.⁵

Application of silver nitrate solution of different concentrations has been used in the treatment of allergic rhinitis and vasomotor rhinitis in the past.⁶ A new, simple and

effective local treatment of allergic and vasomotor rhinitis is using 15 percent silver nitrate, bilateral chemical cautery of the anterior part of the nasal septum and inferior turbinates.⁷ This treatment has been given only to those persons who had sneezing as the presenting symptom. Not only is sneezing troublesome to the patient, but it also annoys his relations, friends and neighbours. The treatment consists of the bilateral application of 15 percent silver nitrate to the anterior part of the nasal septum and to the anterior portion of the inferior turbinates, once a week on one to five occasions. 15 percent silver nitrate is often applied in the pharynx to reduce its irritability. Silver nitrate produces a local astringent action by coagulating albumin. This action seems to reduce the sensitivity and excitability of the mucous membrane treated with silver nitrate. The anterior parts of the nasal septum and inferior turbinates appear to be the 'trigger zones' whose stimulation leads to sneezing and rhinorrhoea. Silver nitrate reduces the sensitivity and excitability of these 'trigger zones' and thus relief is obtained. Once the nasal allergy is controlled, spread to the lower respiratory tract is prevented.⁷

In the present study, an attempt has been made to prove that local application of 15% silver nitrate is a simple and effective treatment with negligible side effects. The old practice of reducing the irritability of the throat by painting it with dilute solutions of silver nitrate was the basis for this treatment.

In our study, 100 patients with allergic rhinitis were selected randomly. In our study, there is predominance of females (55%) over males (45%). Rates of prevalence of allergic rhinitis are similar for males and females and no racial or ethnic variations are reported.⁸ Symptoms of allergic rhinitis can begin at any age, but are most frequently first reported in adolescence or young adulthood. In our study, maximum patients were in the age group of 18 - 29 years.

In our study, all 100 patients presented with sneezing and nasal discharge. 90 out of 100 patients had nasal obstruction. Nasal irritation was present in 83% of cases. Headache and ocular symptoms were present in 23% and 10% respectively. Other symptoms like cough, itching and blocking of the ears were present in 71% of the cases. Similar predominance of sneezing and rhinorrhoea were observed in the other 2 studies.^{7,9} The treatment with 15% silver nitrate solution was effective in relieving rhinorrhoea with good relief in 55% and fair in 38% of cases. Good relief from nasal obstruction was seen in 61% cases and fair in 39%. Headache was relieved in 65% of cases. The best relief obtained was from sneezing with good relief in 80% and fair in 13% of cases.

Comparing our results with Bhargava's results shows that cases with complete or almost complete relief from sneezing were classified as having a 'good result.' Those with substantial reduction in sneezing were grouped under 'fair result.' A poor relief meant absence of relief or insignificant relief. The treatment was considered to be successful in 68.3% of cases with good relief recorded in 58.6% of cases and substantial relief was reported by 9.7%. The results obtained in our study was comparatively better (78.49%). We found 73 out of 93 cases improved after five applications giving a successful result of 78.49%. These cases have been followed up for a period ranging from one to six months. Silver nitrate poisoning can lead to a high percentage of Methaemoglobin in the blood and pigmentation of the gums.⁷

In our study, no such tests were done as there were no complaints from patients. Complications related to the procedure were minimal. Most patients tolerated it well with a few side effects like burning sensation in nose along with transient rhinorrhoea, which settled in few hours' time. Other studies also reported minimal and well tolerated side effects.^{7,10} Local application of 15% silver nitrate have been found to be simple and effective for patients who accept the treatment readily. It can be applied in children over the age of 8 years and it is useful even in those patients who have been treated with corticosteroids locally or systemically. The two kinds of treatment can be complementary to each other for those patients who do not experience relief with one or other mode of therapy. From the above discussion, it is evident that local application of 15% silver nitrate is effective in the treatment of Allergic Rhinitis with successful result of 78.49% in our study with negligible side effects. Long-term results are awaited, and it is suggested that further studies are necessary regarding the number of applications, the interval between applications, the strength of the silver nitrate solution and the possible use of other chemical or physical agents for this mode of treatment.

The treatment by local application of 15% silver nitrate is easy and effective in relieving symptoms. The effect of treatment lasts for a longer time and cost effective. Patients readily accept the treatment and it can be easily repeated if symptoms recur. Side effects are negligible, and no premedication is required. No sophisticated equipment or surgery is required. It has a wide application, as the disease is very prevalent.

CONCLUSION

The treatment by local application of 15% silver nitrate is easy and effective in relieving symptoms. The effect of treatment lasts for a longer time and cost effective. Patients readily accept the treatment and it can be easily repeated if symptoms recur. Side effects are negligible, and no premedication is required. No sophisticated equipment or surgery is required. It has a wide application, as the disease is very prevalent.

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