
Evaluation of Treatment of Sneezing and Rhinorrhoea by Local Application of Trichloroacetic Acid in Patients with non Infective Rhinitis

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Abstract:

Background: Rhinitis is characterized by inflammatory events that lead to chronic nasal symptoms of sneezing, rhinorrhoea and nasal obstruction. These symptoms may change the quality of life and have a great effect on the mood of the patients.

Objective: The aim of the study is to evaluate the effectiveness of application of 50 percent trichloroacetic acid on the trigger areas of the nose to control the symptoms of sneezing and rhinorrhoea.

Methods: 160 patients with non infective rhinitis were prospectively evaluated for 2 years after twice application of 50 percent of trichloroacetic acid on the trigger areas of the nose regarding control and recurrence of symptoms.

Results: significant control was obtained by this method of treatment, success rates ranged from 83.3% to 89.5%, while Failure rates ranged from 10.4 to 16.6 (P<0.001).

Conclusion: This method was found to be simple, effective and practically applicable.

Key words: rhinitis, sneezing, rhinorrhoea

Introduction:

Rhinitis is defined as inflammation of the lining of the nose, characterized by one or more of the following symptoms: nasal congestion, rhinorrhoea, sneezing, and itching¹. However, the ciliated respiratory mucosal lining of the nose and paranasal sinuses are contiguous and it would be rare for one to be affected without the other¹¹. The term rhino sinusitis encompasses this and to the above symptoms one can therefore add hyposmia, anosmia, facial pain and headache¹. Clinically rhinitis is defined by a combination two or more nasal symptoms: running, blocking, itching and sneezing².

No single classification of rhinitis is satisfactory for all¹¹, and chronic rhinitis has been described in the literature using many terms³. Historically "vasomotor rhinitis" has been favored, but distinct vascular or motor nerve dysfunction has been difficult to identify³. Nowadays rhinitis can usually be considered under the following headings: allergic, infectious and others or non allergic non infective rhinitis (Occupational, Emotional, Hormonal, Drug induced, irritantetc.)¹¹.

Non allergic rhinitis and Allergic rhinitis have similar presentation, manifestation, treatment and impact on school and work performance³, thus rhinitis causes a substantial loss of quality of life and carries a heavy economic burden⁴.

There are many reports in the literature about the treatment of Non allergic and allergic rhinitis, but none of the methods used is without side effects, and none of them is ideal for all patients⁵, among these are pharmacotherapy (oral antihistamine, systemic and intranasal steroid, sodium cromoglycate, topical decongestants, ipratropium bromide, and antileukotrienes), Immunotherapy (or

hyposensitization) and surgery (partial inferior turbinectomy, submucosal inferior turbinate diathermy, septoplasty, endoscopic sinus surgery, and vedian neurectomy). Other reported trials include intraturbinate injection of long acting steroid⁶, but this technique shown recently that it carries risk of loss of vision⁷, other trials are cryotherapy^{8, 9}, and application of silver nitrate on the inferior turbinate and nasal septum^{5, 10}, but the latter method carries theoretical risk of silver nitrate poisoning⁵ and silver nitrate may cause temporary discoloration¹¹, the procedure also carry risk severe mucocutaneous reaction¹².

We had been used Trichloroacetic acid for local application on the inferior turbinate and nasal septum to overcome the side effects of silver nitrate.

Patients & methods:

One hundred sixty patients with allergic rhinitis and non allergic non infective rhinitis were selected from the ENT out-patient clinic of Al-Yarmouk teaching hospital and the researchers private clinics, Baghdad IRAQ from May 2005 to May 2008. All patients were complaining from either rhinorrhoea or sneezing or both with or without nasal obstruction. No attempt was made to distinguish between allergic and non allergic rhinitis.

All patients were treated by the same method by local application of 50 percent trichloroacetic acid on the mid portion of the inferior turbinate and adjoining mid portion of the septum (the trigger areas) in area of about 1.5 cm² on each slides [Figure (1) , Figure(2)] by swab stick impregnated in 50% trichloroacetic acid solution. Local anesthesia of 2 percent Lidocaine spray is applied on both nostrils 5-10 minutes before application.

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| <ol style="list-style-type: none"> 1. perpendicular plate. 2. cribriform plate. 3. crista galli. 4. frontal bone. 5. nasal bone. 6. septal cartilage. 7. medial crus. 8. anterior nasal spine. 9. Incisive canal. 10. palatine process. 11. perpendicular plate. 12. | <ol style="list-style-type: none"> postnasal spine. 13. horizontal plate. 14. lateral pterygoid plate. 15 medial pterygoid plates. 16. sphenoid sinus. 17. crest. 18. body. 19. Trigger area on the septum |
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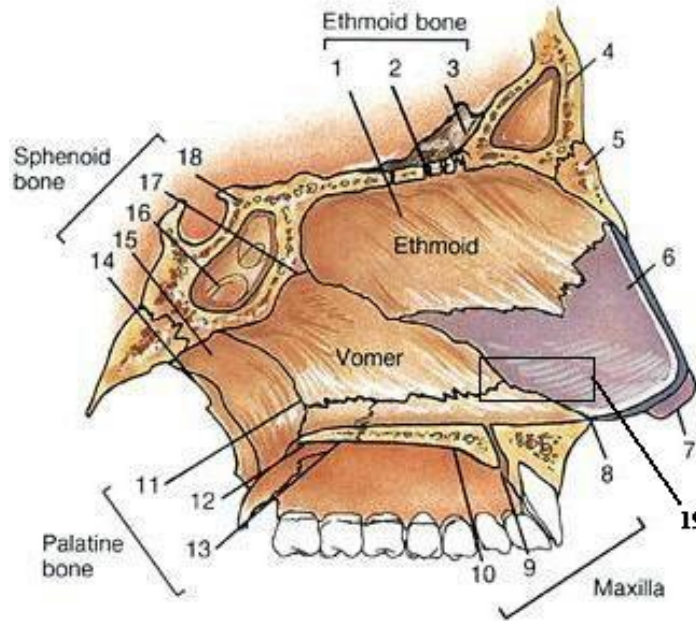


Figure (1): Nasal septum

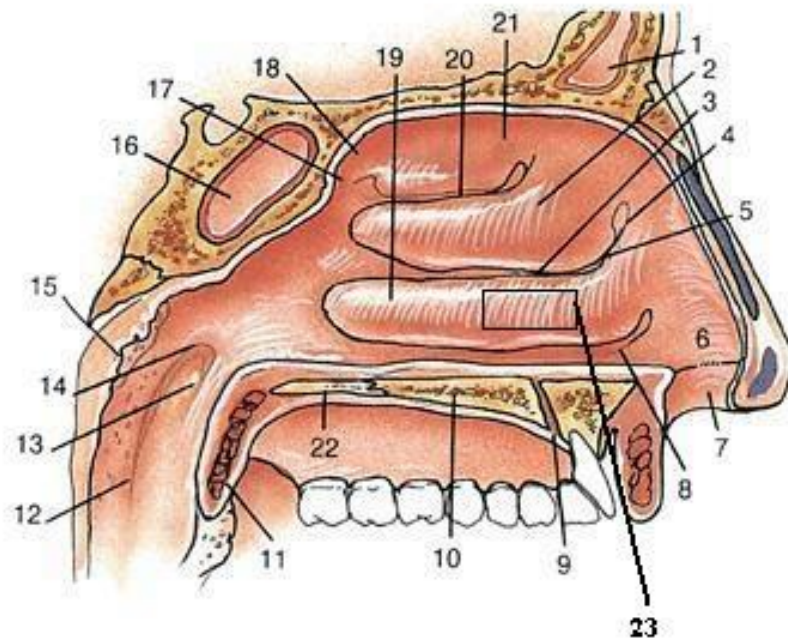


Figure (2): Lateral nasal wall

1. frontal sinus; 2. middle nasal concha. 3. middle nasal meatus. 4. agger nasi. 5. atrium of middle nasal concha. 6. limen. 7. vestibule. 8. inferior nasal meatus. 9. Incisive canal. 10. palatine process of maxilla. 11. soft palate. 12. pharyngeal recess. 13. eustachian tube orifice. 14. tons tubarulus. 15. adenoid. 16. sphenoid sinus opening. 17. sphenoid sinus opening. 18. sphenothmoidal recess. 19. inferior nasal concha. 20. superior nasal meatus. 21. superior nasal concha. 22. palatine bone. 23. Trigger area on the inferior turbinate

All patients had application of 50 percent trichloroacetic acid on both sides two times with one week interval in between, and all patients are followed up for a period of 20-24 months after application, if symptoms reoccur, another application was done. During the time of application and follow up, no other medications were given to the patients.

During the follow up period, results of the treatment are classified in to 3 groups, those patients that the symptoms were disappear or became negligible were regarded as having *effective* treatment, those patients were the symptoms decreases or diminished and the patients felt comfortable were regarded as having *acceptable* results and those patients were they had absence or insignificant relief were regarded as having *poor* results [Table (1)].

Patients that had effective and acceptable treatment results were regarded as *Successful group* while patients that had *poor* treatment results were regarded as *Unsuccessful group* [Table (2)].

Chi square test was used to study the significance of our results.

Table (1): Effects of Treatment and number of cases in relation to symptoms

Symptoms	Number of patients	Successful group		Unsuccessful group
		Effective results	Acceptable results	Poor results
Sneezing	96	64(66.6%)	22(22.9%)	10(10.4%)
Rhinorrhoea	28	12(42.8%)	12(42.8%)	4(14.2%)
Sneezing and rhinorrhoea	36	18(50%)	12(33.3%)	6(16.6%)

Statistical analysis concludes that symptoms of sneezing and rhinorrhoea are homogenous with respect to successful results of treatment with application of trichloroacetic acid ($P < 0.05$).

Table (2): Success and Failure Rates of treatment in relation to symptoms

Symptoms	Success rate	Failure rate	P value
Sneezing	89.583 %	10.416 %	0.000000
Rhinorrhoea	85.714 %	14.285 %	0.000157
Sneezing and rhinorrhoea	83.333 %	16.666 %	0.000063

The results also show that there are highly significant differences between successful and unsuccessful groups according to each symptom ($p < 0.001$) [Table (2)].

Results:

In our research there was slight male predominance, males 92 patients (57%) and female 68 patients (43%), M/F ratio is 1.35 and the patient's age ranged from 12 to 52 years.

Sneezing was the presenting symptoms in 60 percent of the patients (96 out of 160 patients); rhinorrhoea was the presenting symptom in 17.5 percent (28 out of 160 patients) and 22.5 percent of patients (36 out of 160 patients) were presented with sneezing and rhinorrhoea [Table (1)].

The greatest success rate obtained was in patients with sneezing with 89.5 percent (64 patients with effective and 22 with acceptable results out of 96 patients), success rate in patients with rhinorrhoea is 85.7 percent (12 patients with effective and 12 with acceptable results out of 28 patients) and success rate in patients with sneezing and rhinorrhoea is 83.3 percent (18 patients with effective and 12 with acceptable results out of 36 patients) [Table (1) & (2)].

In 8 out of 86 patients with sneezing with successful control, there was recurrence of sneezing after 5 to 6 months for which another 50% of trichloroacetic acid application was tried and the sneezing was controlled; in 7 out of 24 patients with rhinorrhoea with successful control, there was recurrence of rhinorrhoea after 6 to 8 months for which another 50% of trichloroacetic acid application was tried and the rhinorrhoea was controlled.

We also noted that some of the cases presented with nasal obstruction get relief of variable degree after disappearance of symptoms of sneezing and rhinorrhoea.

No obvious adverse effects of local application of 50% of trichloroacetic acid were seen on the patients.

Discussion:

Many methods of treatment of allergic and non allergic rhinitis have been used for management of this problem. Prophylaxis may be done by avoidance of allergic antigen and other stimuli, but is often difficult and may result in emotional problems which do not help the state of the nose¹³ (Emotional non allergic rhinitis).

There are many medications used for control of symptoms, oral antihistamines are rapidly relief sneezing but are less effective on rhinorrhoea and have little or no effect on blockage²; and first generation antihistamines such as chlorpheniramine and diphenhydramine should be avoided because of sedation, psychomotor retardation and learning impairment². Topical corticosteroid is effective on sneezing and rhinorrhoea but less effective on blockage², topical decongestants reduce nasal obstruction but increase rhinorrhoea² and regular use

for more than few days can result in rhinitis medicamentosa¹⁴. Ipratropium bromide is useful against watery rhinorrhoea but it has no effects on sneezing and carry side effects of worsening of glaucoma and prostatism and dry mouth and eyes¹⁵. Regular use of systemic corticosteroids is associated with significant systemic side effects²

Immunotherapy restricted to patients with limited spectrum of allergies² so it may be impracticable in our country, and there is no single surgical procedure that is useful for all patients with rhinitis.

All the above treatments are regarded as a corner stone for the treatment of rhinitis for most of the otolaryngologists but in our practice it seems that most of the above mentioned treatment had a brief benefit and most of our patients encounter adverse effects from either drugs or surgeries or both.

Silver nitrate and trichloroacetic acid produce a local astringent action by coagulating albumin, the sensitivity and excitability of the mucous membrane of the nose seems to be reduced after treatment with trichloroacetic acid. The middle part of the inferior turbinate and the adjacent area of the septum [Figure 1, 2] appear to be the 'trigger area' stimulation of which leads to rhinorrhoea and sneezing⁵. treatment of the trigger area with trichloroacetic acid appear to reduce the sensitivity and excitability of this area and thus relief from these symptoms is obtained, so we adopt this method of local application of trichloroacetic acid on the trigger areas that lead to relatively long lasting control of symptoms in spite of being simple and require no complicated instrument and can be done in any outpatient clinic and free of severe side effects these results coincide with Honda; et al. , 1994 that show "Allergic symptoms were reduced significantly, especially those involving nasal obstruction and watery rhinorrhoea. Nasal airflow resistance also improved after treatment (P < 0.001). Nasal provocation testing revealed a significant decrease in post-treatment responses (P < 0.001). No severe side effects were noted after treatment. Findings demonstrated that local application of trichloroacetic acid is a safe, effective and simple treatment for outpatients with symptomatic nasal allergies."¹⁶ .Research of Yao K K; Shitara T T; Takahashi H H et al. also support our results "It was assumed that TCA application successfully suppressed reagin-dependent allergic reaction in the tissues"¹⁷.

Previous studies also showed that "Inpatient with rhinitis there is a close relationship between severity of nasal symptoms and nasal airflow impairment"¹⁸ this support our result that sneezing and rhinorrhoea are homogenous with respect to successful results of treatment with application of trichloroacetic acid.

We also noted that the cases presented with nasal obstruction get relief of variable degree by our local application of trichloroacetic acid for control of coexistent sneezing and rhinorrhoea, the degree and duration of control of nasal obstruction and the significance and the amount of the nasal flow that can be obtained after application require further study and analysis in the future.

Previous studies use different concentrations of trichloroacetic acid^{16, 17}, the ideal concentration to be used for application on the nasal mucosa for patients with rhinitis require further study as well.

Conclusion:

Application of trichloroacetic acid was found to be effective to control the symptoms of allergic and non allergic rhinitis for relatively long duration and require no other treatment. The procedure requires no complex instrument to perform and is simple and applicable at any ENT clinic and has no serious side effects.

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