Chronic vasomotor rhinitis in the tropics

by A. Gnanapragasam

MBBS (Malaya), DLO (Melbourne)

Lecturer,
Department of Otorhinolaryngology,
Faculty of Medicine,
University of Malaya,
Kuala Lumpur.

CHRONIC VASOMOTOR RHINITIS poses a formidable problem to the rhinologist in the tropics. The patients complain of distressing nasal obstruction, especially at night, with episodes of sneezing and profuse watery rhinorrhoea. They are unduly sensitive to changes in the atmospheric temperature and humidity. Such changes affect the dynamics of nasal circulation. Because of its highly specialised function of purifying, humidifying and warming, the nasal mucosa is endowed with a rich vasculature, controlled by an equally rich autonomic nervous system and local axon reflex. (Ritter 1970 Cuana 1970). Such a specialised functional unit could over react to minor changes, in some patients, causing the above symptom complex commonly known as Vasomotor Rhinitis. In this condition, the nasal airway is totally or partially obstructed. Such obstruction is intermittent and alternates from one to the other side.

There are several methods to relieve this type of obstruction. Almost all of them are empirical since the exact aetiology is unknown. They include:—

(a) Local application of vaso-constrictor drugs. These give only temporary relief.
(b) Long acting antihistamines. They act on the capillaries and mucous secreting glands.
(c) Surface cautery of inferior turbinates with corrosive agents or hot point.
(d) Submucous resection of the inferior turbinate bone (Odeneal 1930) or partial resection of the turbinates. This provides a bigger nasal airway.
(e) Vidian nerve neurectomy
(f) Submucous injection of sclerosing agents such as sodium morrhuate with the hope that they contract the mucosa without injuring the cilia.
(g) Submucous diathermy of the inferior turbinates.

Here an attempt is made to evaluate this last form of treatment. A special effect is made to correlate the result with the clinical picture.

Material and Method

A total of 200 patients, subjected to submucous diathermy between October 1967 – September 1969, were included in this study. A detailed history and their main presenting symptoms were tabulated. (Table I). The complaint of nasal congestion and obstruction was of an alternating type especially present at night. It was aggravated in almost all cases by cold and rainy weather, and changes in atmospheric temperature as when entering an air-conditioned room. The nasal discharge was watery and profuse, associated with sneezing episodes, present mainly in the morning. The headaches varied in their location from frontal, bitemperal to parietal regions; intermittent and severe during attacks. The nasal pain was confined to the nasal cavity. The symptoms in the upper respiratory tract were confined to the post-nasal, oropharyngeal and hypopharyngeal region and varied from discomfort to pain, secondary to infection. The history of allergy was confined to dust and seafood. All these data are tabulated under the major ethnic groups. (Tables I and II).

TABLE I

Presenting Symptoms according to Ethnic Groups

Symptoms	Frequency according to ethnic groups				
	Chinese	Indian	Malay	Others	Total
Nasal congestion and intermittent obst.	122	37	6	3	168
Watery nasal discharge	99	24	7	3	133
Sneezing episodes	62	20	7	0	89
Headache	17	8	0	1	26
Ear complaints	11	–	1	0	12
Nasal pain	1	–	0	0	1
U.R.T. irritation	52	14	2	2	70
Allergy	13	5	2	0	20

TABLE II

Duration of Symptoms – Total 200 cases

Race	0 – 5 months	6 – 12 months	1 – 2 years	2 – 3 years	3 – 4 years	4 – 5 years	5 + years	Total
Chinese	7	6	23	23	11	24	54	148
Indians	2	1	8	6	5	6	12	40
Malays	0	0	2	2	0	1	4	9
Others	0	1	1	0	1	0	0	3

Birtcher Hyfregator was used for this form of treatment. This is a simple device creating, by use of a spark-gap condenser circuit, a very high frequency damped current of relative high voltage, but of a low amperage. Such a current produces electro dessication of tissue around the electrode, causing rupture of cell capsules with transformation into a dry mass. This electrode consists of a fine needle insulated except for one inch at the end. The naked end was inserted submucosally into the inferior turbinate. A current of sufficient intensity between 25 – 50 as shown on the dial of the Hyfrecator was activated for 15 – 20 seconds.

The process was commenced posteriorly and repeated from behind forward (Fig. 1). The nasal mucosa was previously anaesthetised by painting the surface with 5% cocaine in 1:1000 adrenaline. This not only gave an effective anaesthesia but also enabled determination of whether the mucosal swelling was due to oedematous enlargement, in which case it shrank considerably, or to hypertrophy. This confirmed the previous clinical finding by probing. After diathermy, each patient was given long acting antihistamines for varying periods of time. This helped to reduce post-diathermy reaction and edema.

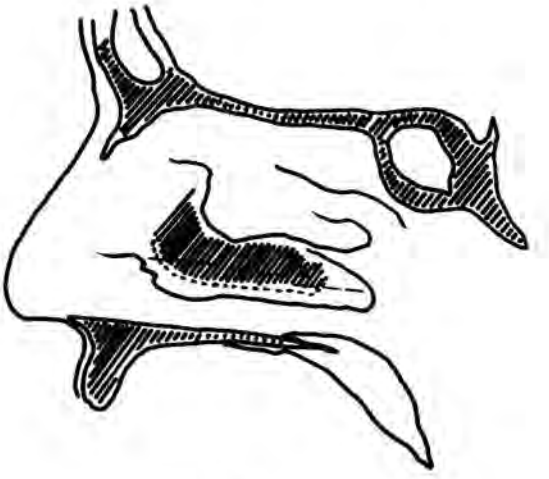

Fig. 1

Diagram showing sites of insertion of electrode along the inferior turbinates

TABLE III

Response to Diathermy according to Clinical and Radiological Finding

Clinical and X-ray Finding	Duration of Systematic Improvement			No
	Immediate 0 – 3 months	Improvement Temporary 3 – 6 months	Permanent 6 months and over	
1. Odematous Nasal Mucosa with Normal Sinus X-ray	15	45	70	2
2. Odematous Nasal Mucosa with +ve Sinuses X-ray Diathermy with Antral washout	2	16	11	–
3. Hypertrophic Nasal Mucosa with Normal Sinus X-ray	12	1	0	10
4. Hypertrophied Nasal Mucosa with +ve Sinus X-rays. Diathermy combined with Antral washout	3	1	0	12

Result

The patients were followed up at intervals of about three months and response to treatment recorded. They were asked whether this treatment gave them relief and if so, the extent and duration. The bulk of these patients were followed up for periods ranging from 12 – 18 months. The response to diathermy was tabulated against the clinical and radiological finding. (Table III). The patients were divided into two main groups:–

(i) Those with engorged and edematous mucosa that pitted easily.

(ii) Those with nasal mucosa that were more turgid and hypertrophied with minimal pitting.

The groups were subdivided according to the radiological findings of the para nasal sinus. Those with positive findings were given appropriate treatment with antral washout, antihistamines and prophylactic antibiotics. Most of them turned out to be mucosal swellings, but those few with frank infection were excluded from this series. The cases with favourable response were divided into three groups:–

Immediate, relief of up to three months

Temporary, relief from three to six months

Permanent, relief over six months.

The failure cases were advised alternative treatment, like partial resection of inferior turbinates with sub-mucous resection of septum if found deviated.

Discussion

The symptoms of nasal obstruction, sneezing and watery rhinorrhoea, in the absence of definite aetiological factors, are distressing to the patients. When the normal airway is obstructed, they experience great respiratory difficulty. The inspired air passing through the nasal cavity has to be humidified and warmed. The relative humidity of alveolar air is 90%, and 70% of this humidity is accounted for by the nasal cavity (Proetz 1963). Similarly, the temperature has to be raised from that of the atmosphere to 35° – 37°C. All this is done in one second – the average time the inspired air takes to pass through the nasal cavity (Ritter 1970). In order to accomplish this, the nasal mucosa not only has to have a rich vascular supply but also an elaborate naso-angio-architectural arrangement. Microscopically, there is a functional arrangement of these vessels in the nasal cavity, especially the turbinates. The minute vessels comprising arterioles, capillaries, sinusoids, venules, have well developed smooth muscles. They run in parallel rows in a posterior – anterior direction and are arranged in three distinct levels in relation to the surface epithelium.

(a) Superficial level lying under the mucosa supplying respiratory epithelium.

(b) Second deeper level in association with the mucous and serous glands, surrounded by loose connective tissue. Sinusoids

are prominent in this layer.

(c) Deeper level adjacent to the osseous supporting framework (Ritter 1970).

These vessels are controlled by:—

(i) autonomic nervous system – sympathetic and parasympathetic

(ii) local axon reflex

(iii) chemical substances carried to the mucosa via the bloodstream (Cuana 1970).

The aim in the above form of treatment is to destroy by dessication the middle vascular layer thereby promoting fibrosis and reduction of the vascular bed. The advantage of this method is that it preserves the respiratory epithelium. Although no histological study was made in this series, clinical observation, as evidenced by the absence of dryness and crusting of the mucosa, seemed to agree with the histo-pathological studies of Uede (1962). He found that low-grade high-frequency electrical current apparently caused vaso-constriction and to some extent occlusion of the vascular network with fibrosis of the submucosal tissue. On the other hand, due to the low-grade current, no injury was caused to the surface epithelium.

The area and depth of tissue dessicated and destroyed with one application in the electrode is directly proportional to:

(a) the current intensity

(b) the surface area of the electrode

(c) duration of current flowing through the electrode

(d) the density and moisture content of the tissue (Birtcher Corp: 1963).

Factor a – c, being constant, the only variable was (d), i.e., the individual variation in the cellular and fluid content. Patients with an edematous vascular mucosa (Table III column 1 and 2) showed a good response to this treatment while those with hypertrophic mucosa had a less favourable result. (Table III column 3 and 4).

Analysing the results of Table I, the majority of patients had one or more of the following symptoms of nasal obstruction, discharge and sneezing episodes. These symptoms were a constant feature. Upper respiratory tract symptoms were present in 70 patients. This is understandable since patients with nasal obstruction breathe through the mouth and this causes drying and irritation of the pharynx. Symptoms of allergy to dust and seafood were present in 20 cases (i.e. 10%), and was controlled with antihistamines. Table III shows the result of submucous diathermy of the inferior turbinates.

Of the 200 cases under review, 176 or 88% had symptomatic relief and 24 or 12% were failures with no relief.

Of the 24 failures, 22 belonged to the hypertrophic group.

Of these improved, 159 or 79.5% were in the odematous group and 17 or 8.5% were in the hypertrophic group.

Of the odematous group, 81 or 40.5% showed prolonged relief, 61 or 30.5% showed temporary relief of up to six months and 17 or 8.5% showed immediate relief up to three months.

Of the hypertrophic group, none showed prolonged relief of symptoms, 2 or 1% showed temporary relief of up to six months and 15 or 7.5% showed immediate relief of up to three months.

Summarising the successful cases, 176 or 88% had beneficial effect, of which 81 or 40.5% had prolonged relief, 63 or 31.5% had temporary relief and 32 or 16% had immediate relief.

Conclusion

Submucous diathermy, as a form of conservative treatment of vasomotor rhinitis, gives satisfactory result in persons who, otherwise, undergo great discomfort. Persons who benefit most from this type of treatment are those in whom symptoms and signs point to a vascular instability resulting in engorged and odematous mucosa. Allergy complicating this condition does not constitute a contra-indication provided it is treated as well. Presence of infection in the nasal or paranasal sinuses is a contra-indication. Long history seems to be the rule (Table II) in most cases under review but my impression is that the shorter the history the better the result of diathermy.

Acknowledgement

The author is grateful to Dr. R. Werner, head, and Dr. U. Prasad for their help and comments and to Miss Yap for assistance in preparing this paper.

References

Cuana, N. 1970, Nasal Vascular Bed – *Annal of Otology, Rhino: Laryngo,* 79: 3: 449.

Cuana, N. and Hinder, K.H. 1969, Fine Structure of Blood Vessels of the human nasal Respiratory mucosa – *Annal of Otol: Rhino: Laryngo,* 78: 4: 865.

Odeneal, T.H. 1930 – Submucous Turbinectomy – *Arch: of Otolaryngol,* 2: 215 – 16.

Proetz, A.W. 1963, 2nd Edition, Applied Physiology of the nose – Annals Publishing Co. St. Louise.

Ritter, F, 1970, Vasculature of the Nose – *Annals of Otology, Rhinology and Laryngology,* 79: 3: 468.

Symposium on Electro dessication and Bi-active Coagulation – Published by the Birtcher Corporation, 1963.

Tremble, G.E., 1960, Methods of shrinking the inferior turbinates to improve the airway – *Laryngoscope,* 70: 175 – 186.

Uede, T. 1962, Results of treatment of turbinates with weak electro coagulation in Chronic Rhinitis – *Otolaryngology (Tokyo) 34: 657 – 659.*