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Cutaneous Manifestations in Type-1 and Type-2 Diabetes Mellitus (A Study Profile of 200 Patients)

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SUMMARY

Diabetes mellitus affects every organ system in the body. Cutaneous manifestations in diabetes are varied, approaching to 100%. We conducted a study at our center to determine the prevalence of skin abnormalities in type 1 and type 2 diabetes mellitus. Two hundred patients of diabetes mellitus were observed for cutaneous manifestations. Twenty one (10.5%) patients were suffering from type 1 diabetes mellitus and 179 (89.5%) patients were suffering from type 2 diabetes mellitus. Mean duration of diabetes mellitus was 7.1±0.89 years and 6.8±0.84 years in type 1 and type 2 diabetes mellitus respectively. Two hundred patients (116 (58%) patients were found to have cutaneous abnormalities. Among these patients 57 (49%) were male and 59 patients (50.86%) were female. Thirteen patients (11.2%) were suffering from type 1 diabetes mellitus and 103 patients (88.7%) were suffering from type 2 diabetes mellitus. No significant effect of type of diabetes mellitus was observed on skin lesions (p=0.12). It is concluded that skin disease is quite common in diabetes mellitus and it is equally prevalent in type 1 and type 2 diabetes mellitus.

INTRODUCTION

Diabetes mellitus is the most common endocrine disorder occurring in about 4% of world population and it is estimated that this figure will raise upto 5.4% by the year 2025.[1]

Diabetes mellitus is classified on the basis of etiology and pathological mechanism. Type-1 diabetes mellitus results in autoimmune ß cell destruction which lead to insulin deficiency. It is characterized by insulin deficiency and tendency to develop ketosis. In type-2 diabetes mellitus, there is variable degree of insulin resistance, impaired insulin secretion and increased glucose production.[2] Exact pathogenic mechanism for cutaneous manifestations of diabetes mellitus is unknown, but important factors associated with pathogenesis of disease are infection,[3] microangiopathy[4], diabetic neuropathy, insulin resistance[5] and autoimmunity. Cutanous manifestations in diabetes are varied, approaching 100%.

Prevalence of cutaneous disorders does not seem to differ between type- 1 and type-2 diabetes mellitus. It has been noted however, that frequency of skin lesions associated with infections is more in type-2 diabetes mellitus while autoimmune disorders are commonly associated with type-1 diabetes mellitus.[5] We conducted a study to determine the prevalence of skin abnormalities in type-1 and type-2 diabetes mellitus at our center.

PATIENTS AND METHODS

Two hundred patients of diabetes mellitus. Visiting Diabetic Clinic or being admitted in Medical Ward of Shaikh Zayed Hospital were studied.

Detailed history and physical examination regarding diabetes mellitus and dermatological symptoms and sign was done. All patient were checked for complete blood count, blood urea, serum creatinine, serum electrolytes, random blood

sugar level, serum lipid profile and HbA_1c.

Chi-square test was used for statistical analysis.

RESULTS

Out of 200 patients, 21 (10.5%) patients were suffering from type-1 diabetes mellitus and 179 (89.5%) patients were suffering from type-2 diabetes mellitus. Eighty seven (48%) patients of type-2 diabetes mellitus were male and 92 (51.3%) patients were female. Mean age of patients with type-1 diabetes mellitus was 32.65±7.33 years and with type-2 diabetes mellitus it was 54.70±11.7 years. Mean duration of diabetes mellitus was 7.1±0.89 years and 6.8±0.84 years, in type-1 and type-2 diabetes mellitus respectively.

Cutaneous abnormalities were observed in 116 patients, a total of 58% patients. Among these patients 57 patients (49%) were male and 59 (50.86%) patients were female. Thirteen (11.2%) patients were suffering from type-1 diabetes mellitus and 103 patients (88.7%) were suffering from type-2 diabetes mellitus (Table 1 & Figs. 1, 2).

Most prevalent cutaneous abnormality was skin infections observed in 44 (23%) patients. Fungal infections were observed in 25 (13.5%) patients, onychomycosis was observed in 7 (3.5%) patients, 2 were suffering from type-1 diabetes mellitus and 5 from type-2 diabetes mellitus. Tinea pedis was observed in 10 patients (5%) all were suffering from type-2 diabetes mellitus. Vaginal condidiasis was observed in two (1%) type-2 diabetic females. Oral candidiasis was observed in one type-1 diabetic male patient.

Tinea cruris was observed in 3 patients (1.5%) one patient of type-1 diabetes and two patients of type-2 diabetes mellitus. Tinea capitis was observed in 3 patients (1.5%), one patient of type-1 diabetes mellitus and two patients of type-2 diabetes mellitus. Tinea capitis was observed in two patients of type-2 diabetes mellitus.

Bacterial infections were observed in 19 patients (9.5%). Impetigo was observed in 6 patients (3%) and all of them was suffering from type-2 diabetes mellitus. Cellulitis was observed in 4 patients two patients of type-1 diabetes mellitus and two of type-2 diabetes mellitus.

Paronychia was observed in 3 patients (1.5%) all were suffering from type-2 diabetes mellitus. Carbuncle was observed in 6 (3%) of patients, one of type-1 diabetes mellitus and 5 patients of type-2 diabetes mellitus. Xanthomas was observed in 5 patients (2.5%) all were suffering from type-2 diabetes mellitus.

Diabetic dermopathy was observed in 12 patients (6%), 2 patients of type-1 diabetes mellitus and 10 patients was suffering from type-2 diabetes mellitus.

Diabetic thick skin was noted in 7 patients (3.5%) all were suffering from type-2 diabetes mellitus. Scleredema of diabetes mellitus was observed in 7 patients (3.5%) all were suffering from type-2 diabetes mellitus. Finger pebbing over the knuckles was observed in 2 (1%) patients suffering from type-2 diabetes mellitus.

Granuloma annulare was observed in one type-2 diabetic patient (0.5%). Diabetic foot was observed in 4 patients (2%) all were suffering from type-2 diabetes mellitus. Diabetic rubiosis was observed in 3 patients (1.5%) all were suffering from type-2 diabetes mellitus. Lichen planus was observed in one patient (0.5%) suffering from type-2 diabetes mellitus. Seborrboeic dermatitis was observed in one type-2 diabetic patient (0.5%).

Necrobiosis lipoidica was observed in 2 (1%) patients, one patient was suffering from type-1 diabetes mellitus and one from type-2 diabetes mellitus.

Skin complications related to treatment of diabetes mellitus was observed in 9 patients (4.5%) in the form of allergic reactions to metformin (n=5) and insulin lipoatrophy (n=4). Eruptine xanthomas were observed in 2 (1%) patients both were having type-2 diabetes mellitus.

Acanthosis nigricans was observed in 3 patients (1-5%), one patient of type-1 diabetes mellitus and two patients of type-2 diabetes mellitus. Callus on the foot was observed in two patients (1%) both were suffering from type-2 diabetes mellitus. Other skin disorders related to diabetes mellitus were not observed in the study. No significant effect of type of diabetes mellitus was observed on skin lesions (P=0.12).

Table 1: Distribution of cutaneous conditions between type-I and type-2 diabetes (n=116)

Skin lesions	No. of patients	Type of diabetes mellitus		Total	Percent
		Type-1	Type-2		
Granuloma annulare	1		1	0.5	0.5
Vitiligo	4		4	2.0	2.0
Xanthelasma	5		5	2.5	2.5
Lichen planus	1		1	0.5	0.5
Diabetic thick skin	7		7	3.5	3.5
Scleroderma of diabetes mellitus	7		7	3.5	3.5
Seborrhic dermatitis	1		1	0.5	0.5
Diabetic foot	4		4	2.0	2.0
Paronychia	3		3	1.5	1.5
Carbuncle	6	1	5	3.0	3.0
Impetigo	6		6	3.0	3.0
Cellulitis	4	2	2	2.0	2.0
Tinea pedis	10		10	5.0	5.0
Tinea cruris	3	1	2	1.5	1.5
Tinea capitis	2		2	1.0	1.0
Oral candidiasis	1	1		0.5	0.5
Onychomycosis	7	2	5	3.5	3.5
Rubiosis fascie	3		3	1.5	1.5
Allergic reaction to metformin	5		5	2.5	2.5
Insulin lipoatrophy	4	1	3	2.0	2.0
Pruritis	6		6	3.0	3.0
Necrobiosis lipoidica	2	1	1	1.0	1.0
Eruptive xanthomas	2		2	1.0	1.0
Acanthosis nigricans	3	1	2	1.5	1.5
Callus on foot	2		2	1.0	1.0
Shoe dermatitis	1		1	0.5	0.5
Finger pebbles	2	1	1	1.0	1.0
Diabetic dermopathy	12	2	10	6.0	6.0
Vaginal candidiasis	2		2	1	1

DISCUSSION

Diabetes mellitus is an endocrine disorder with multi-system involvement. Prevalence of cutaneous manifestations in diabetes mellitus varies from 30-70%.[6] In our study prevalence rate of 58% is recorded.

In Pakistan two studies done on cutaneous manifestations of diabetes mellitus shows a prevalence rate of 68-96%.[7,8]

The prevalence of cutaneous disorders does not seem to differ between type 1 and type 2 diabetes mellitus.[8] Same observation was recorded in present study.

Common observation in our study was cutaneous infections observed in 23% patients. Diabetics are prone to cutaneous infections due to delayed chemotaxis, angiopathy, neuropathy and decreased serum bactericidal activity. An incidence of 20-50% is reported.[9]

Twenty percent diabetics are diagnosed as a result of septic skin infections.[10] Uncontrolled diabetes mellitus produces infections that are generally resistant to treatment.[11] Bacterial infections were more common than fungal infections.[7] In previous studies diabetic dermopathy is reported as most common cutaneous manifestation.[3] In our study fungal infections were observed (n=25), more than the bacterial infections. Twenty two patients were suffering from

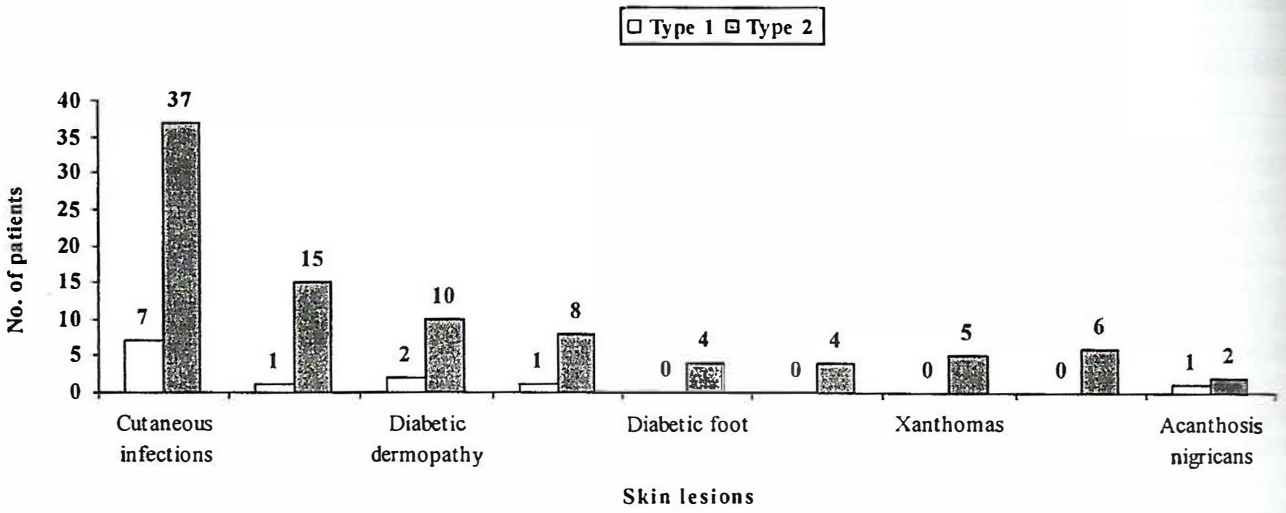

Fig. 1: Distribution of skin lesions in type 1 and type 2 diabetes mellitus.

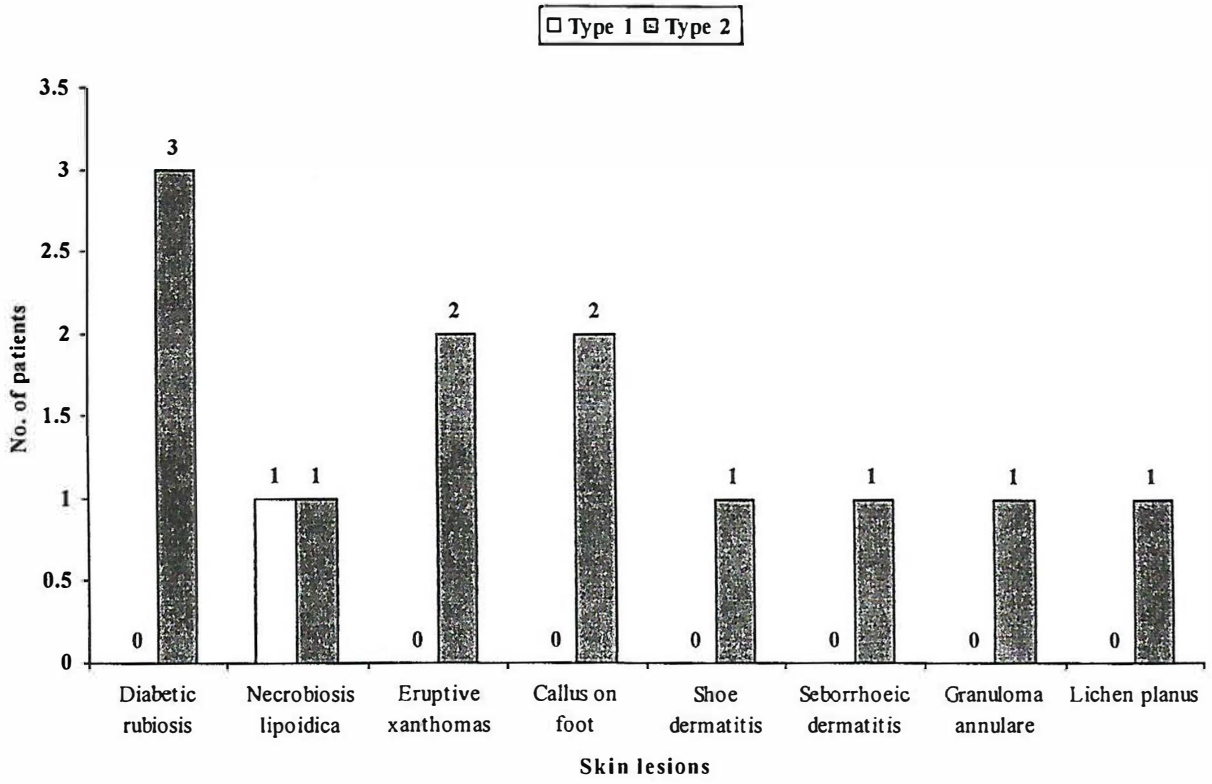

Fig. 2: Distribution of skin lesions in type 1 and type 2 diabetes mellitus

onychomycosis, tinea cruris, tinea pedis and tinea capitis. Yeast infections were noticed in three patients include oral and vaginal candidiasis. Bacterial infections were observed in 19 patients included cellulitis, impetigo, carbuncle and paronychia.

Diabetics have high incidence of skin thickness reported in a range from 8-50%.[12] Skin

thickness is commonly observed on the dorsum of fingers, palms, soles, posterior thorax and neck.[13] It manifests as localized skin thickness, scleredema diabeticorum or finger pebbles. In our study 8% patients manifested with these problems.

Xanthelasmas are generally associated with dyslipidemias, however these patients may have normal serum lipid levels.[8] In our study 5 patients (2.5%) were having xanthelasmas. All these patients were suffering from type 2 diabetes mellitus. High mean serum cholesterol value was observed in all type 2 diabetic patients in our study group.

Diabetic dermopathy is the most common cutaneous manifestation with a reported incidence of 12.5% to 70%.[3,14] Diabetic dermopathy manifesting as irregular, round usually bilaterally symmetrical lesions was observed in 12 patients (6%). These lesions were unnoticed by most of the patients.

A definite association between localized granuloma annulare and type 1 diabetes is described.[15] They may be single or multiple lesions, flesh colored rings or papules commonly noticed in the areas of trauma.[3] However, in our study granuloma annulare was observed in one type 2 diabetic patient in the form of single ring lesion on the leg.

Vitiligo is an autoimmune disorder appearing with increased frequency of about 9% in type 1 diabetics.[16] In type 2 diabetes mellitus 4-5% cases are reported.[17] However, in our study all cases of vitiligo were observed in type 2 diabetic patients (4%).

Diabetic foot lesion is the most dreadful complication of diabetes mellitus. It can cause diabetic foot ulcers and gangrene.[10] 20% of hospitalized patients are admitted because of diabetic foot. In our study diabetic foot ulcers were observed in 2 (1%) patients and two patients (1%) were having amputation of toes. Sensory symptoms were recorded in 40 patients.

Diabetics are prone to develop a reddish complexion secondary to engorgement's of superficial vessels of face. An incidence of 3-59% has been reported in patients with diabetes.[4] In our study it was observed in 3 (1.5%) patients of type 2 diabetes mellitus.

Lichen planus presenting as flat topped violaceous, papular eruption over the flexor aspects of forearms, wrists, lower legs and back occurs in 1.6-3.8% of diabetic population.[3,18] In our study it was observed in 1 patient (0.5%) involving flexor aspects of both legs.

Generalized pruritis is not reported as the manifestation of diabetes. However it was recorded in few patients.[11] In our study it was recorded in 6 patients (3%) in the absence of any other skin pathology.

Necrobiosis lipoidica is the best known cutaneous marker of diabetes mellitus producing sharply demarcated plaques of atrophic yellowish skin which may or may not ulcerate.[19] Non ulcerating lesions were recorded on both legs anteriorly in two type 2 diabetics.

Eruptive xanthomas are the common presentations of disorders of lipid metabolism[20] In our study they were recorded in two type 2 diabetic (1%) patients.

Acanthosis nigricans is associated with insulin resistance.[21] Congenital form is recorded in 60% cases.[22] In our study it was observed in two obese type 2 diabetics and in one type 1 diabetic patient (1.5%).

If I compare the results of my study with the two other studies available in Pakistan, it is found that cutaneous infections are more prevalent in our population.

If we compare the study with other international studies, it is observed that diabetic dermopathy is the most common cutaneous manifestation followed by cutaneous infections and diabetic thick skin.

In our study no patient was suffering form double skin pathology due to diabetes mellitus. It is therefore concluded that skin disease is quite prevalent in diabetes mellitus and same measures are required both in type-1 and type-2 diabetes mellitus to control skin disease.

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Treatment of Allergic Rhinitis By 25% Silver Nitrate Cauterization

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SUMMARY

A series of 50 patients were closely assessed prospectively to determine the effectiveness, untoward effects and patient acceptance of new method of treatment of allergic rhinitis by 25% silvernitrate application. Age range was 14-45 years except one who was 55 years old. This study describes the technique, uses and results obtained following the application of 25% silvernitrate on the inferior turbinate in patients with allergic rhinitis. Each patient was evaluated regularly which based on both subjective response and clinical examination. We selected only patients having complain of nasal obstruction (92%), rhinorrhoea (82%) and sneezing (88%). Silvernitrate 25% was used after topical anaesthesia 4% xylocaine with adrenaline and three applications were used after interval of one week. Successful relief was obtained with improvement in nasal obstruction (86%) sneezing (84%) and rhinorrhoea (68%). Regarding complications no major complication were noted except, mild to moderate pain, nasal congestion and increased rhinorrhoea and all were temporary for one or two days and relieved by taking analgesics. In this study we found in follow up 4 patients still had nasal obstruction (8%), 7 patients with rhinorrhoea (14%) and sneezing in 2 patients (4%). This new method was found to be simple, easy and effective. It is based on the astringent effect of local application of silvernitrate solution.

INTRODUCTION

Allergic rhinitis is an IgE mediated hypersensitivity disease of the mucous membrane of the nasal airways characterized by sneezing, itching, watery nasal discharge and sensation of nasal obstruction. Nasal allergy with or without the involvement of lower respiratory tract is an ever increasing global problem. Due to the enormity of the environmental pollution in developing countries, it needs to be seriously addressed. A conservative estimate suggest 15-20% prevalence and 0.5-1% incidence in general population.[1] Its diagnosis and management are still controversial. The hope for cure is frustrating improper communication among the physicians, difficulty in acclimatization to environmental conditions and the lack of cost effective drugs in various regions are the distacles in treating nasal allergy effectively. The reason for the origin of allergy is now linked to three factors operating concomitantly. The genetic factors, inhospitable environment, the pre and postnatal exposure to allergens. Atopic gene with changes chromosome (5A & II) has now been established. In Germany alone 40% of all atopic persons have shown this genetic change (Moseges 1997).[2] The ancillary risk factors include, smoking, atopic parents, early ablactation, pets, gas, heating and traffic pollution. Rhinitis for convenience is classified into infective, idiopathic, allergic and harmonal/drug induced group. Idiopathic group replaces the more ambiguous term, the vasomotor rhinitis. It is due to nasal hyper responsiveness to certain strong stimuli via a reflex mechanism than any medication via a true vasomotor pathogenesis.[3] The diagnosis of nasal allergy depends on comprehensive history, nasal cytology, skin tests for specific IgE and serum IgE estimate.[4] Nasal provocation testing as demonstrated by rhinomanometery and acoustic rhinometery gives a good deal of satisfaction to the sufferers when treated with different compounds on the spot. Serum IgE estimate incorrelation with the skin test has attained importance though it is non

specific.[5] The treatment of the nasal allergy rest in avoidance, pharmacotherapy and immunotherapy. Avoidance involves the use of face mask, and protectors against pollens and housedust. Immunotherapy have always been a very expensive option and is now gradually in a phase-out stage.[6] This is the era of topical antihistamines and negligible absorbed locally acting steroids. In pharmacotherapy, drugs may act to counter the mode of action on the tissue, e.g allergic sensitization (immune modulators) most cells/most cell stabilizers, or effectors cells (specific antagonists).

There are many reports in literature about treatment of allergic rhinitis but none of the method used is without side effects and none of them is ideal for all patients. These methods are hyposensitization, drugs, surgical measures.

The local application of silvernitrate (25%) to inferior turbinate was applied for hyposensitization. Silvernitrate produces a local astringent action by coagulating albumen.[7] The sensitivity and excitability of the mucous membrane of nose seems to be reduced after treatment with silvernitrate. The treatment is simple, effective and has no significant side effects.

MATERIAL AND METHODS

This was a prospective study carried out at ENT Department at Shaikh Zayed Hospital, Lahore from May 2000 to February 2002. Fifty patients, among 37 male and 13 females with age range 14-45 years included except one who was 55 years old. All selected patients were diagnosed and selected on history and clinical bases. No laboratory tests or specific tests were advised. All selected patients were disappointed by all medical treatments. In all patients detailed history and clinical ENT examination was done. Only those cases who had rhinorrhoea, sneezing and nasal obstruction were selected, regardless of previous therapy. Each case was treated on the same principle. No attempt was made to distinguish between the perennial and seasonal allergic rhinitis. We excluded the patients having DNS, nasal polyps and other benign and malignant lesion of nose. All patients who had acute infections of nose postponed till recovery.

All events of procedure were discussed with patient in detail regarding complication and outcomes. Local cautry was performed in local anaesthesia on the whole accessible part of inferior turbinate by using a swab stick dipped in 25% silvernitrate. The procedure then repeated on the other side. The area to be cauterized was first anaesthetized using xylocaine with adrenaline. All patients had an application of silvernitrate 25%. Once a week repeated for four weeks. No other type of treatment was given during the course of treatment and follow up except analgesics. All patients were advised to report again if they had repeated symptoms. The results were collected by filling proforma before the treatment and end of follow up after 3 months.

RESULTS

There were more male than female patients (37 male and 13 females) (Table 1). The patients age ranged between 14 and 45 years except one who was 35 years old. Nasal obstruction was presenting complaint in 46 of the 50 patients (92%) rhinorrhoea in 41 patients (82%) while sneezing in 44 patients (88%). The treatment was considered to be effective when symptoms completely disappeared or become negligible and such patients were classified as having a good result, while those patients who felt comfortable or were greatly relieved, were grouped under acceptable result.

Table 1: Sex distribution.

Sex	Number	Percent
Male	37	74.0
Female	13	26.0
Total	50	100.0

A poor result meant an absence of or insignificant relief. The two groups of results good and acceptable were considered to be successful results and were achieved in 43 patients having nasal obstruction (86%). Similarly rhinorrhoea disappeared in 34 patients (68%) and symptoms of sneezing improved in 42 (84%) regarding the complication no major or minor complication noted except 4 patient (8%) had still nasal obstruction, 7

patient (14%) with rhinorrhoea and sneezing in 2 patients (4%) remained as such (Table 2)

Table 2: Results of study (Relief of symptoms)

Results	Nasal obstruction	Rhinorrhoea	Sneezing
No. of cases	46	41	44
Good	32 (64%)	30 (60%)	40 (80%)
Acceptable	11 (22%)	4 (8%)	2 (4%)
Poor	4 (8%)	7 (14%)	2 (4%)
Overall success rate	83 (86%)	34 (68%)	42 (84%)

DISCUSSION

Many fashions in the treatment of allergic rhinitis have followed each other but none has so far been established itself as the treatment of choice one step in the prophylaxis of allergic rhinitis is the avoidance of allergenic exposure, but this is often difficult and may result in emotional problems which do not help the state of nose.[8] The second step is hyposenstization, but in perennial rhinitis the results are frequently disappointing. The detection of the responsible allergens in this common condition may be very difficult.[9] Moreover skin test has a risk of anaphylaxis and are no longer in common use.

Antihistamines are useful for symptomatic relief but most adults are unable to take due to unacceptable side effect drowsiness or dizziness, although non sedating antihistamines are available now, but side effects vary in different persons.

Vidian neurectomy has been advised for those with severe rhinorrhoea not responding to medical and simple surgical remedies.[10] But this operation is not without potential complications[11] recommended intraturbinal steroid injections and reported good and prolonged relief, but many patients are reluctant to have such injections.

Weir (1967)[12] used transnasal zinic ionization to control the symptoms, but there was improvement in nasal obstruction only other symptoms remained as such[13,14] used cryotherapy to control the symptoms of vasomotor rhinitis, only nasal obstruction was relieved while other symptoms not affected. Capel and Mckelvie[15] showed in their study that some patients were helped by disodium cromoglycate insufflation. The mode of action of disodium cromoglycate is preventive but duration of its effect is short. Systemic steroids are not suitable for long-term maintenance therapy but are very useful as a short course to bring the symptoms under control systemic steroids are now replaced by topical steroids, but the absorption of active steroids from the nasal mucosa can not be excluded and therefore long-term use of topical steroids is not advisable.[16]

Nasal drops containing ephedrine HCL or naphalzaline are commonly used but side effects such as congestion, tachyphylaxis and rhinitis medicamentosa are frequently observed.[17]

Thomson and Negus[18] had mentioned the uses of pure phenol and trichloracetic acid for surface application on inferior turbinate of allergic rhinitis, but they condemned their use because of their destructive action with loss of delicate epithelium and its replacement by scar tissue.

Bhargava et al.[19] found local application of 15% silvernitrate to be simple and effective and patients accepted the treatment readily. This study reports the successful results in 75.5% of cases. Best relief was obtained from most annoying symptoms of sneezing and rhinorrhoea.

Another study which was carried out by Sm-Al-Samarrae[20] in 52 patients by local application of 20% Ag No.3 on allergic patients. In this report successful relief was obtained in 88.5% patients. Our study on allergic patients showed successful relief of 86% in nasal obstruction, sneezing in 84% and rhinorrhoea disappeared in 68%. Mild temporary side effects were noted like congestion, pain and rhinorrhoea which relieved by analgesics.

We noted residual symptoms like 8% had still nasal obstruction, 14% with rhinorrhoea and sneezing in 4%. So for this widely prevalent disease this treatment was found to be simple, easy and useful with negligible side effects.

CONCLUSION

1. Treatment by local application of 25% silvernitrate is ease and get effective in

relieving symptoms.
2. Effect lasts for much longer time.
3. It can be easily repeated if symptoms recur.
4. Side effects are negligible.
5. No sophisticated equipment or surgery is required.
6. Patient readily accept the treatment as they do not mind the application of medicine in the nose.
7. It has wide application, as the disease is very prevalent.
8. Also suitable for cooperative children.

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