

A STUDY ON THE CUTANEOUS MANIFESTATIONS OF DIABETES MELLITUS BADANIA NAD SKÓRNYMI MANIFESTACJAMI CUKRZYCY

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Abstract

The cutaneous manifestations of diabetes mellitus are varied. We conducted a study of fifty patients having diabetes mellitus coming from the department of dermatology and medicine. The commonest cutaneous feature of diabetes were pyodermas seen in 40% patients, dermatophytosis seen in 36% patients, pruritis diabetic thick skin seen in 20 % patients, diabetic dermopathy seen in 16% patients, diabetic bulla and rubeosis seen in 8% patients each and meralgia paraesthetica and diabetic foot seen in 4% patients each. About the associations of diabetes mellitus, achrochordons were seen in 8% patients, vitiligo and perforating dermatoses were seen in 6% patients each, granuloma annulare, eruptive xanthomas, acanthosis nigricans, necrobiosis lipoidica and oral lichen planus were seen in 4 % patients each and xanthelasma was seen in 2% patients.

Streszczenie

Skórne manifestacje cukrzycy są zróżnicowane. Przeprowadziliśmy badania pięćdziesięciu pacjentów, chorych na cukrzycę z oddziału dermatologii i medycyny. Najczęstszą skórą cechą cukrzycy były piodrmie - 40% pacjentów, grzybice - 36% pacjentów, pruritis diabetic thick skin - 20% chorych, dermatopatia cukrzycowa - 16% chorych, cukrzycowe pęcherze i rumień - 8% pacjentów oraz meralgia paraesthetica i stopa cukrzycowa - 4% pacjentów. Towarzyszące cukrzycy achrochordons obserwowano u 8% pacjentów, bielactwo i dermatozy perforacyjne obserwowano u 6% pacjentów, ziarniniak obrączkowaty, wysiewne kępki żółte, acanthosis nigricans, necrobiosis lipoidica i oral lichen planus obserwowano u 4% pacjentów oraz xanthelasma obserwowano u 2% pacjentów.

Key words: diabetes mellitus; microvascular; insulin; metabolic; dermatosis

Słowa kluczowe: cukrzyca; mikrokrążenie; insulina; metabolizm; dermatozy

Introduction

Diabetes mellitus is a worldwide problem and the most common endocrine disorder [1]. Its prevalence is increasing in the present scenario of a sedentary lifestyle in the general population. Abnormalities of insulin and elevated blood glucose level lead to metabolic, vascular, neurological and immunological abnormalities. Affected organs include the cardiovascular, renal and nervous systems, eyes and the skin. The skin is affected by both the acute metabolic derangements and the chronic degenerative complications of diabetes [2]. Although the mechanism for many diabetes associated skin conditions remains unknown, the pathogenesis of others is linked to abnormal carbohydrate metabolism, other altered metabolic pathways, atherosclerosis, microangiopathy, neuron degeneration and impaired host mechanisms [3]. The association of certain skin diseases with diabetes mellitus has been fairly well recognized with an incidence rate ranging from 11.4 to 71% [4,5]. Skin manifestations in diabetes mellitus are common and expressed in numerous forms. If one considers metabolic effects on microcirculation and changes in skin collagen, prevalence approaches 100 percent

[6]. Findings range from the presenting manifestations of the disease to signs of long term involvement, from the mundane to indications of serious, even life threatening problems.

Materials and Methods

Fifty patients having diabetes mellitus coming from the department of dermatology and medicine were taken up for the study. A detailed history was elicited in each case with particular reference to cutaneous complaints and including details regarding duration, history of evolution, progression and treatment modalities, if any. A detailed dermatological examination, serum cholesterol, liver and kidney function tests and electrocardiogram were carried out. Assessment of diabetic retinopathy was done by an ophthalmologist. Assessment of diabetic neuropathy was done on the basis of the criteria detailed by Foster [7]. Relevant microbiological and histopathological investigations were carried out to confirm the clinical diagnosis.

Results (Tabl. I-III)

The data was collected and the results were analyzed.

SR NO	Duration of disease (yrs)	No of patients	Percentage
1	< 1	8	16
2	1-2	10	20
3	2-5	24	48
4	>5	8	16
	Total	50	100

Table I. Duration of diabetes mellitus

SR NO	Associations	No of patients	Percentage
1	oral lichen planus	2	4
2	vitiligo	3	6
3	perforating dermatoses	3	6
4	granuloma annulare	2	4
5	eruptive xanthomas	2	4
6	achrochordons	4	8
7	acanthosis nigricans	2	4
8	necrobiosis lipoidica	2	4
9	xanthelasma	1	2

Table II. Associations of diabetes mellitus

SR NO	Associations	No of patients	Percentage
1	dermatophytosis	18	36
2	candidiasis	6	12
3	pyodermas	20	40
4	pruritis	14	28
5	diabetic dermopathy	8	16
6	meralgia paraesthetica	2	4
7	diabetic bulla	4	8
8	rubeosis	4	8
9	diabetic thick skin (finger pebles)	10	20
10	diabetic foot	2	4
11	nail changes	12	24

Table III. Cutaneous features of diabetes mellitus

Discussion

In our study, the majority of patients were between 41- 50 years and the mean age of patients was 42.5 years. Females outnumbered males and female:male ratio was 2.57:1. Regarding the duration of diabetes mellitus 16% patients had duration of diabetes less than 1 year, 20% patients had duration of diabetes less than between 1 – 2 years, 48% patients had duration of diabetes less than between 2 – 5 years and 16% patients had duration of diabetes more than between 5 years. 96% patients had Non insulin dependent diabetes mellitus (NIDDM) and 4% patients had insulin dependent diabetes mellitus (IDDM). The commonest cutaneous feature of diabetes were pyodermas (Fig. 1) seen in 40% patients, dermatophytosis seen in 36% patients (Fig. 2), pruritis diabetic thick skin seen in 20 % patients, diabetic dermopathy (Fig. 3) seen in 16% patients, diabetic bulla (Fig. 4) and rubeosis seen in 8% patients each and meralgia paraesthetica and diabetic foot (Fig. 5) seen in 4% patients each. About the associations of diabetes

mellitus, achrochordons were seen in 8% patients, vitiligo and perforating dermatoses were seen in 6% patients each, granulomaannulare, eruptivexanthomas, acanthosisnigricans, necrobiosis lipoidica and oral lichen planus were seen in 4 % patients each and xanthelasma was seen in 2% patients.

In majority of diabetics, the duration of disease was less less than 6 years. As the duration of diabetes increases, there is non enzymatic glycosylation of dermal collagen and mucopolysaccharides, leading to various cutaneous manifestations [8]. Uncontrolled diabetes increases the risk of development of microangiopathy and related complications or sequelae [9,10]. From the foregoing account, we conclude that the skin is involved in diabetes quite often and whenever patients present with multiple skin manifestations, their diabetics status should be checked and controlled; or if they are obese, a high index of suspicion should be kept regarding their diabetic status [11,12]. The recognition of these findings is the key to treatment and prevention.



Figure 1. Pyoderma on the abdomen of a 30 years old female



Figure 2. Candidal intertrigo of toe webs in a 40 year male



Figure 3. Diabetic bulla in a 47 year old male



Figure 4. Diabetic foot ulcer in a 52 year male

Diabetes mellitus is a common condition which frequently has skin manifestations. The attachment of glucose to protein may result in a profound effect on structure and function of that protein, and account for clinical manifestations of the disease [13,14]. It has been suggested that increased crosslinking of collagen in diabetic patients is responsible for the fact that their skin is generally thicker than that of non-diabetics. Advanced glycosylation end products are probably responsible for yellowing of skin and nails [15]. Increased viscosity of blood due to stiff red blood cell membranes results in engorgement of the post-capillary venules in the papillary dermis, detected as erythema of the face, or periungual erythema. It is suggested that these skin changes

may eventually be used as a reflection of the patient's current as well as past metabolic status [16,17].

Candida infection of the web spaces usually involves the 3-4 web space of the hands or the 4-5 web spaces of the toes. This area has a tendency to retain moisture due to occlusion from apposing surfaces of skin. Presumably the increased sugar content of the skin encourages the establishment of this infection. The clinical appearance is a white patch of skin, often with central peeling. Toe web space involvement is often mistaken for a dermatophyte infection, but the diagnosis can be confirmed on potassium hydroxide preparation [18]. Toe web space infections may lead to inflammation and fissuring that can serve as a portal of entry for bacterial infection in a compromised diabetic foot [19]. The oxygen demand of the subsequent inflammation may exceed the ability of the diabetic microcirculation, leading to gangrene. It is for that reason that tinea pedis should be aggressively managed in patients with neurovascular compromise. Involvement of the toe nails by dermatophytes is common among elderly diabetics as it is in the population at large. The infection itself is of little consequence, but the nail dystrophy which results may make proper nail care more difficult for the patient. Thickening of skin of the hand is a common occurrence, with a range of manifestation from simple pebbling of the knuckles to the diabetic hand syndrome [20]. The diabetic hand syndrome consists of thickened skin over the dorsum of the digits and limited joint mobility, especially of the interphalangeal joints.

The earliest description of this phenomenon was apparently the observation that insulin-dependent diabetes was occasionally complicated by painful stiff hands [21]. More common is simple thickening, and some have demonstrable involvement of the dorsum of the feet. Clinical clues which suggest such a thickening include difficulty in tenting the skin, pebbled or rough skin on the knuckles or periungual region, and decreased skin wrinkling following immersion in water [22]. Atrophic hyperpigmented macules on the shins, so called diabetic dermatopathy, has been termed the most common cutaneous finding in diabetes [23]. It is usually noted as irregularly round or oval, circumscribed, shallow lesions vary in number from few to many, which are usually bilateral but not symmetrically distributed. They are asymptomatic and often overlooked. Diabetic dermatopathy probably represents post-traumatic atrophy and post-inflammatory hyperpigmentation in poorly vascularized skin [24]. Another curious phenomenon in diabetes mellitus is the spontaneous appearance of blisters on the extremities. These lesions are not the result of trauma or infection. They tend to heal without treatment. From the foregoing account, we conclude that the skin is involved in diabetes quite often and whenever patients present with multiple skin manifestations, their diabetic status should be checked and controlled; or if they are obese, a high index of suspicion should be kept regarding their diabetic status. The recognition of these findings is the key to treatment and prevention.

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