CUTANEOUS MANIFESTATIONS AMONG DIABETIC CHILDREN

Thesis

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ABSTRACT

Rationale and background: Diabetes Mellitus (DM) is a disease that leaves no tissues or organ of our body unaffected. The changes found in the skin are largely parallel to those occurring in internal organs.

Objective: This study was carried out to study the types of cutaneous manifestations and their prevalence in diabetic children with cutaneous diseases in comparison with control patients with cutaneous diseases attending the pediatric dermatology out patient clinic.

Patients and methods: This hospital based study was conducted on 304 Egyptian children (152 diabetic patients and 152 non diabetic patients both suffering from cutaneous diseases). Both diabetic patients and control patients were subjected to personal history and clinical examination.

Results: The results showed that complications of insulin therapy in diabetic children had highest incidence (28.9%), followed by allergic skin diseases (19.1%). Pruritus came in the third order (15.1%) followed by cutaneous bacterial infections (12.5%) then cutaneous fungal infections (11.2%). While in control cases, allergic skin diseases showed the highest incidence (28.9%), followed by cutaneous bacterial infections (14.5%), parasitic infestations (11.2%) and sweat rash (10.5%).

Conclusion: From the present series we can conclude that complications of insulin treatment especially lipohypertrophy was the most prevalent cutaneous manifestation among diabetic children. Generalized idiopathic pruritus was a common cutaneous symptom among Type 1 diabetic children**.** Type 1 diabetic patients were less prone to develop eczema, on the other hand

Key words: Cutaneous diseases - Type I diabetes (IDDM) - Lipophypertrophy - Generalized pruritus – Eczema.

Limitations: The choice of the control should not have been from the attendants of the dermatology outpatient clinic as this could have contributed to biased results.

List Of Abbreviations

ADA	**American Diabetes Association.**
ADMA	**Asymmetric Dimethylarginine.**
AI	**Acquied ichthyosis.**
APD	**Acquired perforating dermatoses.**
CA	**Candida albicans.**
CAM	**Cellular adhesion molecules**
CRP	**C-reactive protein.**
CTLA4	**Cytotoxic lymphocyte antigen 4.**
DC	**Dupuytren's contracture.**
DD	**Diabetic dermopathy.**
DKA	**Diabetic ketoacidosis.**
DM	**Diabetes mellitus.**
DPN	**Diabetic poly neuropathy.**
EBV	**Epstien-Barr virus.**
EGFR	**Epidermal growth factor receptor.**
FGFR	**Fibroblast growth factor receptor.**
GA	**Granuloma annulare.**
GAD	**Gutamic acid decarboxylase.**
GEP	**Glycosylation end products.**
GIST	**Gastrointestinal stromal tumour.**
HbA_{1C}	**Glycated hemoglobin.**
HIV	**Human immunodeficiency virus.**
HLA	**Human leukocyte antigen.**
HZV	**Herpes zoster virus.**
IDDM	**Insulin-dependent diabetes mellitus.**
IFN- γ	**Interferon- γ.**
IGF-I	**Insulin-like growth factor-I.**
IGFBP-3	**Insulin-like growth factor-binding protein 3.**
IGT	**Impaired glucose tolerance.**
IL-12	**Interleukin-12.**
KOH	**Potassium hydroxide.**
LJM	**Limited joint mobility.**
MODY	**Maturity-onset diabetes of the young.**
NF	**Necrotizing fasciitis.**

NIDDM	**Non–insulin-dependent diabetes mellitus.**
NK	**Natural killer.**
NLD	**Necrobiosis lipoidica diabeticorum.**
NO	**Nitric oxide.**
NPH	**Non purified human.**
NXG	**Necrobiotic xanthogranuloma.**
OGTT	**Oral glucose tolerance test.**
PTPN22	**Protein tyrosine phosphatase non-receptor 22.**
SGA	**Subcutaneous GA.**
SPEs	**Streptococcal pyrogenic exotoxins.**
SSA	**Streptococcal superantigen.**
T1DM	**Type 1 diabetes mellitus.**
TGF	**Transforming growth factor.**
TNF-α	**Tumour necrosis factor-α.**
VVC	**Vulvovaginal candidiasis.**

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INTRODUCTION

Diabetes Mellitus (DM) is a disease that leaves no tissues or organ of our body unaffected. The changes found in the skin are largely parallel to those occurring in the internal organs. Many skin disorders show an increased incidence and severity in patients with diabetes, the biochemical factors responsible in most instances are poorly understood. About 30% of all patients with diabetes eventually will develop cutaneous changes during the course of the disease. Complications mainly results from biochemical, structural and functional abnormalities. The concept of the skin performing as a temporary reservoir for excess blood glucose may account for tendency to develop pruritus and both bacterial and fungal infections ***(Oumeish, 2008).***

Diabetes in childhood is a common and important problem. The peak age of onset of insulin dependent diabetes mellitus (IDDM), which accounts of virtually all cases of childhood diabetes, is around 12 years. The pathogenesis of diabetes and its complications are identical to those in adults. But the treatment of the disease in childhood is greatly influenced by physiological process of growth, maturation and puberty together with changes in the capacity of the child for self-management and the interplay of family life, emotional and social development. It is also reported that over 95% of diabetes in childhood are due to IDDM and that rare causes include maturity-onset diabetes ***(Pickup and William, 1997).***

Diabetes Mellitus is widely spread all over Egypt, its incidence being 1.09 per 1000 among Cairo school aged children ***(Salem. et al., 1990).***

Long standing diabetes mellitus leads to permanent and irreversible functional changes in cells of the body which lead to various complications. Skin being the largest organ of the body, is readily available for inspection and scientific study in case of every disease. It is particularly important in diabetics because it essentially does get involved in one way or another. It is well known that DM is associated with a number of skin manifestations. Skin changes generally appear subsequent to the development of DM but may be the first presenting sign or even precede the diagnosis by many years. Similar to other complications such as retinopathy and nephropathy, skin manifestations are largely the results of the combined effect of hyperglycemia, neuropathy, microvascular angiopathies and impaired host immune mechanisms. The main mechanism behind all these changes is thought to be non-enzymatic glycosylation and product formation. This process occurs to a minor extent at normal blood sugar concentration and is apparently accelerated in patients with increased blood glucose levels ***(Khurshid et al., 2009).***

Although the cutaneous manifestations of diabetes are well known and considered common, systemic surveys of the cutaneous findings in young diabetic patients with IDDM are sparse. Moreover, there is lack of distinction between prevalence among patients with IDDM and those with NIDDM. Several reports suggest that some of

the skin manifestations in diabetic patients may reflect the degree of long-term control of the disease and are associated with other diabetes complications ***(Perez and Kohn, 1994).***

Cutaneous manifestations are common in type I diabetic patients, and some of them, like acquired ichthyosis and keratosis pilaris, develop early in the course of the disease. Diabetic hands and rubeosis faciei are related to the disease duration ***(Pavlović et al., 2007).***

Aim of work:

This study was carried out to determine the types of cutaneous manifestations and their prevalence in diabetic children with cutaneous diseases (≤ 15 years) in comparsion with control patients with cutaneous diseases within the same age group.