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INTRODUCTION AND OBJECTIVES

- The pathogenesis of diabetes-associated skin problems may be linked to abnormal carbohydrate metabolism, altered metabolic pathways, atherosclerosis, microangiopathy, neuron degeneration, and impaired host mechanisms [1]. The cutaneous findings are classified into four major groups: 1) skin diseases associated with diabetes, such as scleroderma-like changes of the hand, necrobiosis lipoidica, and diabetic dermopathy; 2) cutaneous infections; 3) cutaneous manifestations of diabetes complications such as neuropathic foot ulcers; and 4) skin reactions to diabetes treatment [2].
- This study aimed at evaluating the prevalence and the spectrum of skin manifestations in patients with type 1 diabetes mellitus (T1D) attending DEMPU clinic of Cairo University and to examine the clinical correlation to disease duration and metabolic control.

METHODS

- A prospective observational study included 4221 subjects with T1D patients attending the DEMPU clinic between December 2010 and September 2011. Patients were included if they have T1D and aged less than 18 years. Exclusion criteria included any T1D patient who did not manifest with any cutaneous disease, or associated other systemic diseases that may have cutaneous manifestations.
- Full history taking including age, sex, onset, course, and duration of the present cutaneous lesions, associated diseases, history of previous skin diseases and in T1D patients; duration of diabetes and type of insulin therapy were recorded.
- Detailed dermatological examination was carried out by a dermatology team and the cutaneous findings were recorded.
- The charts of T1D patients were reviewed for the mean of HbA1c in the past year to assess the glycemic control, and thyroid profile, lipid profile and any other available labs to rule out any associated condition that may be associated with cutaneous manifestations.

RESULTS

- The overall prevalence of cutaneous manifestations in T1D patients in the study group was 3.6%. The studied group included 152 patients with T1D and cutaneous manifestations (74 male and 78 female) with a mean age of 8.38 ± 3.79 years (ranged from 1.5-15 years). The mean duration of diabetes was 2.80 ± 2.86 years and the mean HbA1c was $8.91 \pm 7.96\%$. Our study had a limitation; it was based initially on a questionnaire including the whole group (4221), however 225 T1D were randomly selected from the whole group to be fully examined dermatologically this made the final prevalence 67.5% (152/225).
- Concerning the spectrum of dermatoses in T1D patients, **complications of insulin therapy** was the most common and diagnosed in 44 cases (28.9%). The most common insulin complication was insulin lipohypertrophy (36/44 cases) followed by bruises at insulin injection sites (6/44 cases), brown pigmentation at insulin injection sites came in the third order (2/44 cases). **Cutaneous infections** were the second common and diagnosed in 38 cases (25%); they included bacterial, fungal and viral infections (Figure 1). Bacterial infections were diagnosed in 19 cases (12.5%), 6 males and 13 females. Boils, impetigo and acute paronychia were diagnosed in 16, 2, 1 case/s respectively. Cutaneous fungal infections were diagnosed in 17 cases (11.2%), 3 males and 14 females. The most common fungal infection was candidiasis (monilial vulvovaginitis) (11/17) cases followed by tinea versicolor, tinea corporis and tinea capitis in 3, 2 and 1 case/s respectively.
- The most common allergic skin disease in the study group was papular urticaria (12/29) cases followed by pityriasis alba, urticarial and eczema in 11, 4, 2 cases respectively.
- There was no significant sex difference in patients with complications of insulin therapy and pruritus. While, cutaneous bacterial and fungal infections were significantly higher in females compared to males. However, allergic diseases were more common in males. Acne and hyperhidrosis of hands were observed only in male patients (Figure 2).
- The mean age, diabetes duration, and HbA1c for diabetic patients with different skin manifestation are summarized in table (1). The mean age for patients with complications of insulin therapy was 9.49 ± 3.38 , mean duration was 3 ± 1.59 , and HbA1c was 7.73 ± 1.41 .
- T1D Patients with complications of insulin treatment had significantly older age and longer diabetes duration compared to other T1D patients. While, there was no significant difference regarding the sex or the mean HbA1c.
- Patients with bacterial infections had significantly younger age compared the other T1D patients while there was no significant difference as regards diabetes duration or HbA1c. There was no significant difference between patients with fungal infections and other diabetics as regards the age, diabetes duration and HbA1c.
- Allergic skin diseases were significantly higher in males than females (20 cases, 68.9% versus 9 cases, 31.1%). Patients with allergic skin diseases had significantly shorter diabetes duration but no significant difference as regards the age and HbA1c as compared to other T1D patients. No significant difference between patients with pruritus and other T1D patients as regards the age, sex, diabetes duration and HbA1c.

Figure (1): The spectrum of the skin manifestations in T1D patients.

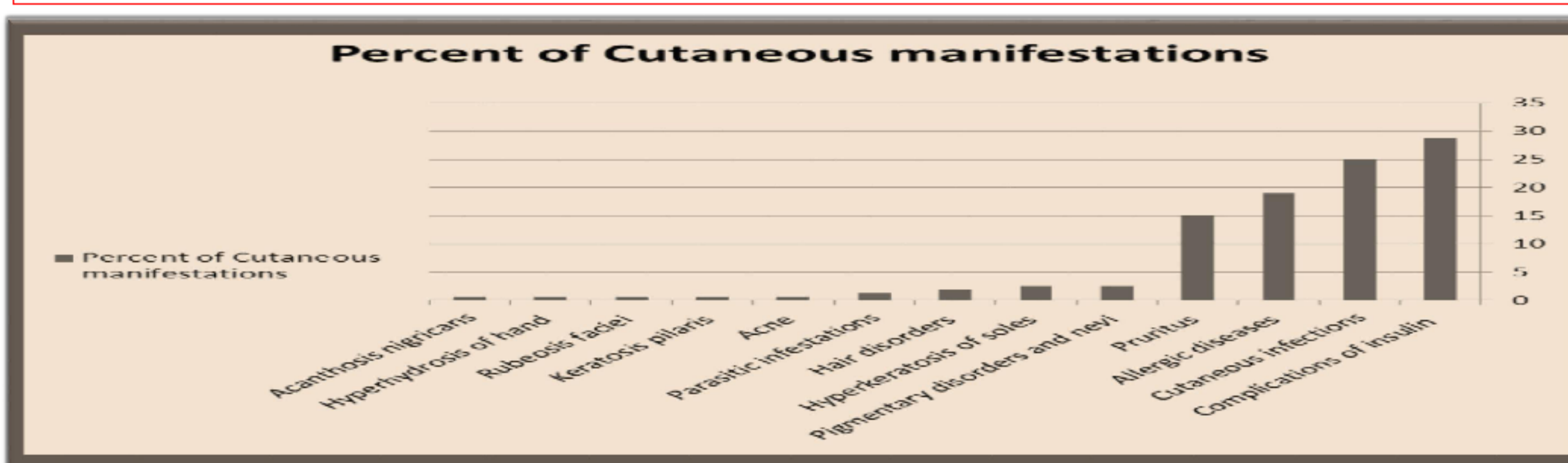
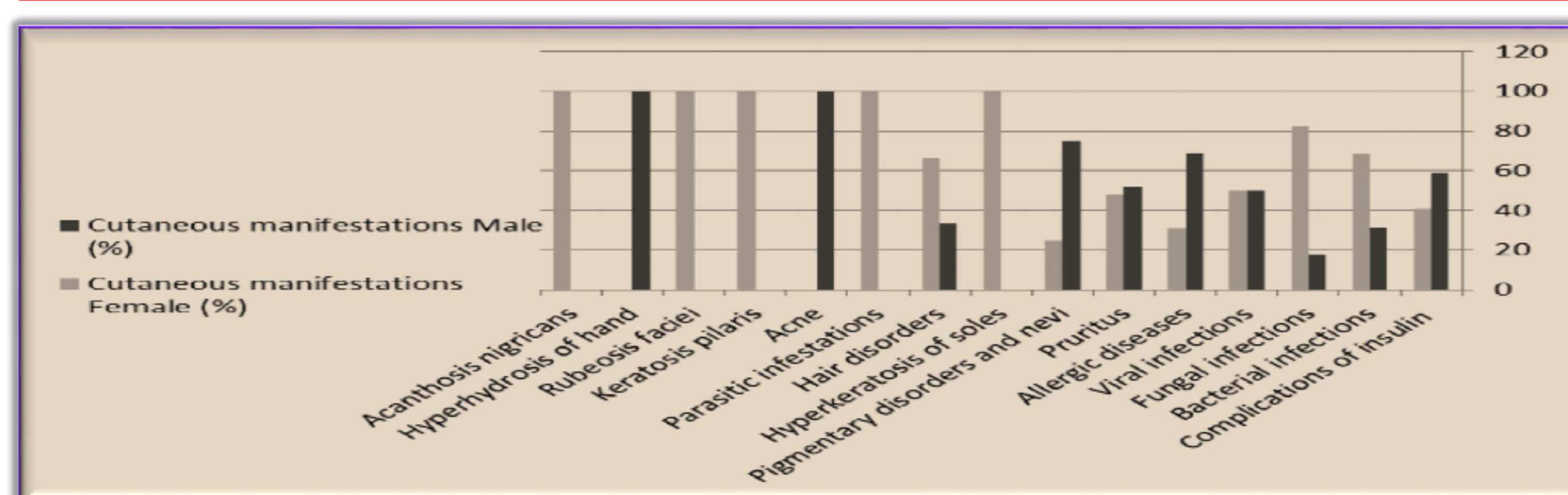


Table (1): The mean age, diabetes duration, and HbA1c for T1D patients with different skin manifestations (n=152):

Cutaneous manifestations	Age (year) (mean±SD)	Diabetes duration (years) (mean±SD)	HbA _{1c} (%) (mean±SD)
Complications of insulin Treatment (n=44)	9.49±3.38	3.62±2.78	8.38±2.25
Cutaneous infections (n=38)	6.76±3.71	3±1.59	7.73±1.41
Bacterial infections (n= 19)	6.42±3.4	2.33±2.17	7.69± 1.27
Fungal infections (n= 17)	6.88± 3.49	2.08±1.91	8.02±1.57
Viral infections (n=2)	7±4.24	2.5±0.71	7.5±1.41
Allergic diseases (n= 29)	7.62± 4.66	2.2±2.99	7.82±1.5
Pruritus (n= 23)	8.37± 2.87	2.72±3.96	8.31±2.17
Pigmentary disorders and nevi(n=4)	11.25±1.5	3.31±2.09	8.27±2.36
Hyperkeratosis of soles (n=4)	8.5±4.04	2.46±2.26	8.75±3.18
Hair disorders (n=3)	12±1.73	4.83±3.17	6.36±0.23
Parasitic infestations (n=2)	8±5.65	0.37±0.17	6.45±0.07
Acne (n=1)	13	1	6
Keratosis pilaris (n= 1)	15	3	6.5
Rubeosis faciei (n= 1)	6.5	4	7.2
Hyperhidrosis of hand (n= 1)	14.5	1.5	8.5
Acanthosis nigricans (n= 1)	10	8	6.9

Figure (2): Sex distribution for different dermatoses in T1D patients.



CONCLUSIONS

- Complications of insulin treatment especially lipohypertrophy, were the most prevalent cutaneous manifestation among T1D patients. Cutaneous infections came in the 2nd order. Candidal infections especially monilial vulvovaginitis was the most common fungal infection observed in T1D patients.
- Generalized pruritus is a common cutaneous symptom among T1D patients. Pigmentary disorders and hyperkeratosis of the sole were more prevalent in diabetic patients.

References

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