

LETTER TO EDITOR

HYPERMAGNESEMIA IN DIABETIC END STAGE RENAL DISEASE (ESRD) PATIENTS

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SIR- Magnesium is known to play an important role in carbohydrate metabolism and its imbalance has been implicated as a cause, consequence, or complications of diabetes mellitus. Magnesium serves as cofactor for about 300 cellular enzymes many of which are involved in energy and carbohydrate metabolism (1-4).

Disorders of mineral metabolism are among the less well understood clinical problems encountered by clinicians and magnesium heads that list. Hypermagnesemia has an impact on vital organs, which is usually seen in diabetic ESRD due to decreased excretion. Keeping this in mind we have conducted a study to examine the serum magnesium, glucose levels and renal parameters in 60 diabetic ESRD patients, before and after hemodialysis. The serum Magnesium level was found to be significantly higher before dialysis in most of the patients which can be attributed to associated cardiovascular and central nervous system complications. However, the level decreased significantly after dialysis. The positive correlation of the results is presented in the Table.

Table : Biochemical Parameters Before and After Hemolysis

	Random Blood Sugar (mg/dl)	Serum Urea (mg/dl)	Serum Creatinine (mg/dl)	Serum Magnesium (mg/dl)
Before Hemolysis	196 ± 19.3	146.9 ± 48.9	6.65 ± 1.4	5.16 ± 1.1
After Hemolysis	173 ± 20*	35.6 ± 5.7***	1.14 ± 0.8***	3.02 ± 0.5**

Statistical comparison was done between before and after values; *p<0.05; **p<0.01; ***p<0.001

The diabetics have been reported to have decreased levels of Magnesium (4) and supplementation of Magnesium improves Insulin sensitivity and metabolic control in Type 2 diabetes (5). However, in present study chronic diabetic subjects with ESRD showed hypermagnesaemia which suggests the primitive role of magnesium in diabetes with ESRD.

Thus, the maintenance of normal levels of magnesium may be of great significance in the assessment of glycemia. Hence a routine monitoring of magnesium may be of significance to clinicians for better management of diabetes with ESRD.

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Discussion

Majority of the patients belonged to the age group of 10-40 years, which corroborates with the findings of Narayani *et al.*¹⁴ The males outnumbered females by a ratio of 4.6:1 in this study, which is consistent with the finding of Takama *et al.*² Barefooted laborers constituted the majority of patients (62%) in our study which is similar to the observation of previous study.¹⁴ Pitted keratolysis was evident in 10% of the patients with history of prolonged usage of occlusive foot wear in the present study. In a study on industrial workers, pitted keratolysis was especially prevalent (1.5% of 4325 patients) in those wearing rubber shoes, probably due to retention of sweat.¹⁵

The duration of pitted keratolysis ranged from 15 days to five years with average being 10.98 months in our study. The duration varied from one day to five years and one months to 10 years in previous studies.^{2,14}

In our study, soles alone were affected in 94% of cases, whereas involvement of both soles and palms was observed in 6% of patients. In this study pressure bearing areas were the commonest sites affected in 92% of cases followed by nonpressure bearing areas (4%) and friction areas (4%). However involvement of pressure bearing areas in 92.5%, frictional areas in 32% and non-pressure bearing areas in (13.2%) of cases has been reported in an earlier study.²

Hyperhidrosis was the commonest symptom reported by 70% of cases in the present study, which is consistent with the findings of Gill and Buckels.¹⁶ However hyperhidrosis was evident in 96.2% of cases in one study and in only 20% of cases in another study.^{2,14}

Mild pruritus was reported in 60% of patients in our study, however, pruritus was observed in only 7.5% of patients in the previous study.² Pruritus has not been documented as a significant symptom of pitted keratolysis in other studies on the subject.¹⁷

Sliminess was seen in 54% of cases in the present study, which is not a wide disparity with earlier observation on the subject. Malodor and Burning of soles was reported in 36% and 8% respectively in the present study. Which is similar to the observation of earlier study.²

Pitted keratolysis has been reported as a painless condition by many previous studies.^{13,16,18,19} However in the present study, 26% of patients complained of pain while walking. Number of pits varied from 1 to 50 in majority (56%) of the patients, followed by 50-100 in 28% of cases. More than 100 pits were seen in 16% of the cases. However the number of pits varying from five to more than hundred has been reported in previous study.¹⁶

In our study, majority of the case that is 48% had pits size varying from 0.5 to 1 mm.

However large pits size varying from 2 mm to 4 mm in one study and the size of more than 7 mm was recorded by another study.^{16,18} Depth of the pits was 1-2 mm in majority (60%) of cases, which is consistent with earlier observation on the subject.¹⁶ Other morphological features of pits observed in the present study, which has not been documented in previous studies on the subject include margin of the pits and whether the pits were discrete or coalesced.

Associated dermatological conditions observed in the present study included psoriasis (10%), dermatophyte infections (6%) and plantar warts (6%), which corroborates the findings of earlier studies.

Corynebacterial triad was observed in one case in the present study. The coexistence of these three Corynebacterial diseases has been documented in the literature.²⁰

Other associated conditions were fissuring of soles in 38% and corn in 2% of the patients, which has not been documented in other studies on the subject.

Conclusion

Pitted keratolysis is fairly common in bare-footed male farmers of rural India. The condition is predominantly seen over the pressure bearing areas of sole and hyperhidrosis is common precipitating factor. Pruritus, a common presenting symptom and involvement of both palms and soles observed in few cases in the present study, has not been reported earlier.

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