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Calcium homeostasis in diabetic patients with critical conditions

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68% of diabetic patients present impaired calcium homeostasis, regardless of type of diabetes, age and sex. Mainly hypocalcemia is present.
Diabetes mellitus is characterised by the deficit of calcium retention, as a result of activation of renal calciuretic function.
Management of critical clinical condition caused by diabetic ketoacidosis requires thorough monitoring of calcemia and calciuria and its dynamic correction.

Key Words: Calcium, homeostasis, diabetic patients,critical conditions

Diabetic (DM) patients are often in need of critical care medicine. It is well known, that in diabetic patients Calcium (Ca) metabolism, one of the important body functions, is very much affected (1,2,3). This is well studied in general population (3,4), but data about patients with critical conditions is scarce.

Determine Calcium homeostasis in diabetic patients with critical conditions.

a. Study calcemia indicators (whole and ionised) in patients with type one (DM1) and type two diabetes (DM2).

b. Study calcemia indicators (whole and ionised) in hipoglycemic patients and patients with diabetic ketoacidosis

c. study daily calciuria in the above mentioned groups.

Materials and methods: A total of 30 controls and 120 diabetic patients were studied: 52 with DM1 and 68 with DM2; 70 female and 50 male.28 patients had diabetic ketoacidosis, 30 - hypoglycemic condition.Whole andionisedserum Calcium was measured in intravenous blood of cases and controls; daily calciuria was as well measured. Table 1 shows the age groups and table 2 duration of Diabates mellitus.

Table 1

Age (y)	18-25	26-45	45-65	>65 i
Cases	30	35	30	25

Table 2

Duration of DM	<1 year	1-5 years	5-10 years	10-20 year	>20 years
Cases	18	22	40	28	12

Results and discussion:

68% of cases showed impaired calcium homeostasis, independently from age, sex and clinical type of diabetes. Diagrams 1-6 show serum whole and ionised blood calcium as well as daily calciuria in cases and controls.

Diagram 1.

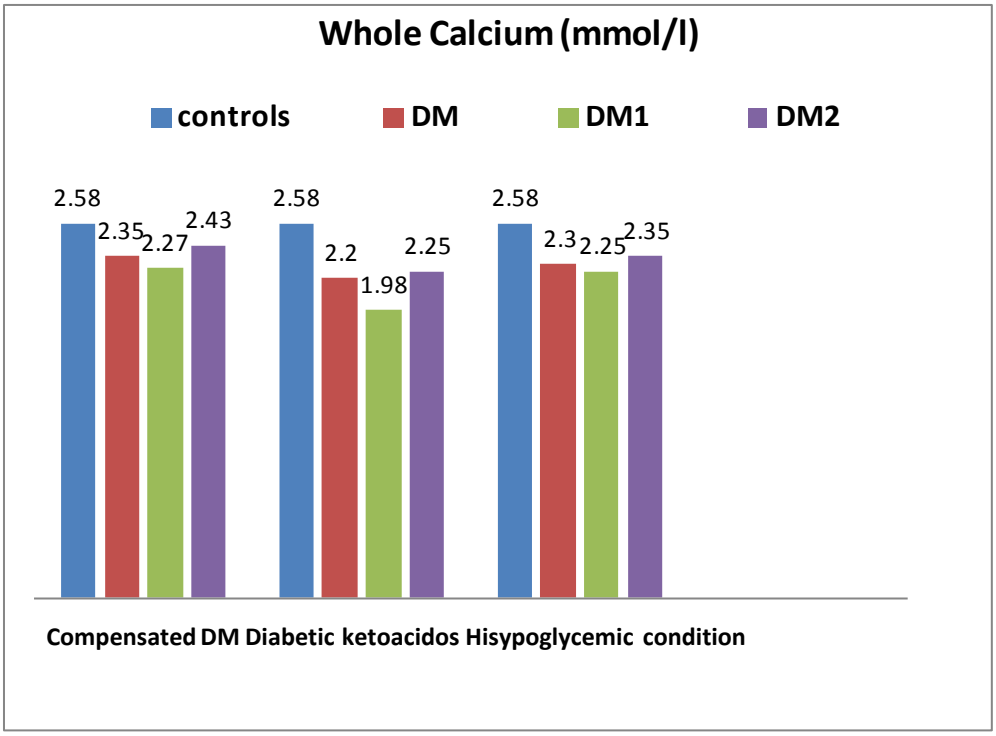


Diagram 2.

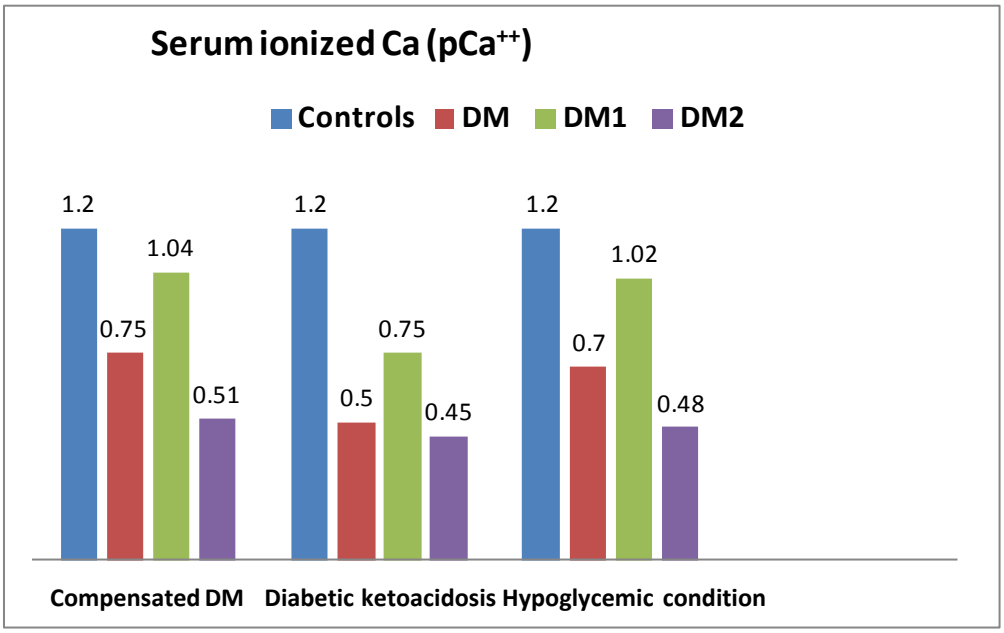
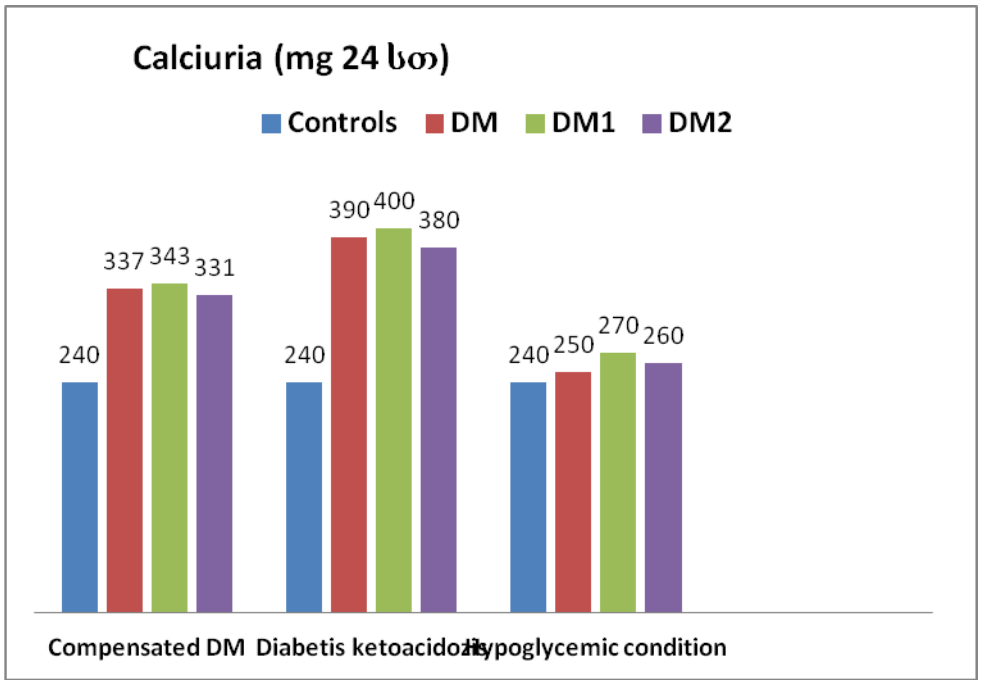


Diagram 3.



Results confirm impaired calcium homeostasis in diabetic patients. Hypocalcemia is more prevalent, especially evident when comparing ionisedcalcium. Results are aggravated with increased decompensation of diabetes mellitus and reach the peak in diabetic ketoacidosis. Hypoglycemic condition is characterized with normal values of blood calcium and decreased calciuria. Positive correlation was seen between calcemia and calciuria indicators(r=....), which makes us think about the importance of calciuretic renal function and its pathologic activation in diabetic patients.

Conclusions:

68% of diabetic patients present impaired calcium homeostasis, regardless of type of diabetes, age and sex. Mainly hypocalcemia is present.

Diabetes mellitus is characterised by the deficit of calcium retention, as a result of activation of renal calciuretic function.

Management of critical clinical condition caused by diabetic ketoacidosis requires thorough monitoring of calcemia and calciuria and its dynamic correction.

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შაქრიანი დიაბეტით დაავადებულთა 68%-ს აღენიშნება კალციუმის ჰომეოსტაზის დარღვევა დაავadების ტიპის,ავადმყოფთა ასაკისა და სქესის განურჩევლად. ამასთან უპირატესად ადგილი აქვს ჰიპოკალციემიას,რაც პროგრესირებს დეკომპენსაციის ხარისხის მატებასთან ერთად. შაქრიანი დიაბეტი ხასიათდება ორგანიზმში კალციუმის შეკავების „დეფიციტით“, შედეგად მიმდინარეობს თირკმლის კალციურეზული ფუნქციის გააქტივება.ამიტომ დიაბეტური კეტოაციდოზით განპირობებული კრიტიკული მდგომარეობის სრულყოფილი მართვა მოითხოვს კალციემიის და კალციურიის დონის მონიტორინგს და კორექციას.