OSTEOCALCIN AND UNDERCARBOXYLATED OSTEOCALCIN IN NEWLY DIAGNOSED DM2 PATIENTS ADVISED ON LIFESTYLE IMPROVEMENT

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INTRODUCTION: INSULIN IS THE KEY LINK BETWEEN ENERGY AND BONE METABOLISM. IN THE PRESENCE OF INSULIN OSTEOBLASTS SECRETE UNDERCARBOXYLATED OSTEOCALCIN, WHICH PROMOTES PANCREATIC BETA-CELL PROLIFERATION, INSULIN SECRETION AND ITS TISSUE SENSITIVITY, FATTY TISSUE METABOLISM AND ENERGY EXPENDITURE THUS CONTRIBUTING TO EUGLYCEMIA.

AIM: TO INVESTIGATE OSTEOCALCIN AND UNDERCARBOXYLATED OSTEOCALCIN IN ADULT PATIENTS WITH NEWLY DIAGNOSED DIABETES MELLITUS TYPE 2 (DM2) ADVISED ON LIFESTYLE CHANGES FOR GLYCEMIC OPTIMIZATION.

PATIENTS:

STUDY INCLUDED 57 PATIENTS NEWLY DIAGNOSED WITH DM2 (21 F, 36 M):

AGE 57 YEARS, 30-80 (MEDIAN, RANGE)

BMI 29.2, 23.2-43.6

FASTING BLOOD GLUCOSE 9.5 nmol/L, 7.9-15

HbA1c 8.0%, 6.3-12.0

PATIENTS WERE ADVISED ON LIFE-STYLE IMPROVEMENT, NO BLOOD GLUCOSE MEDICATION WAS PRESCRIBED, AND RE-EVALUATED AFTER THREE MONTHS.

METHODS:

TOTAL OSTEOCALCIN, UNDERCARBOXYLATED OSTEOCALCIN AND CROSSLAPS WERE MEASURED BY COMMERCIAL KITS, AND OTHER BIOCHEMICAL PARAMETERS BY STANDARD RECOMMENDED BIOCHEMICAL METHODS.

RESULTS:

NO DIFFERENCE FOR ANALYSED DATA EXISTED BETWEEN SEXES.

AT THE SECOND VISIT (N=22) LIFESTYLE CHANGES WERE OBSERVED BY STATISTICALLY SIGNIFICANT DECREASE OF BMI, GLUCOSE, HBA1C AND INDICES OF STEADY STATE BETA-CELL FUNCTION (NOT PRESENTED). NO DIFFERENCE FOR OSTEOCALCIN OR UNDERCARBOXYLATED OSTEOCALCIN WAS FOUND BETWEEN VISITS.

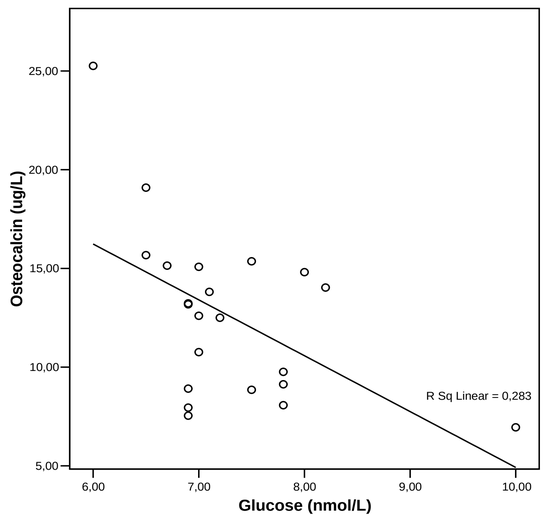
FOR THE SECOND VISIT (N=22) TWO PAIRS OF PARAMETERS REVEALED STATISTICALLY SIGNIFICANT NEGATIVE CORRELATIONS BETWEEN GLUCOSE AND OSTEOCALCIN (p=0.01), AND ALSO GLUCOSE AND CROSSLAPS (p=0.046), AND CONSIDERED UNEXPECTED.

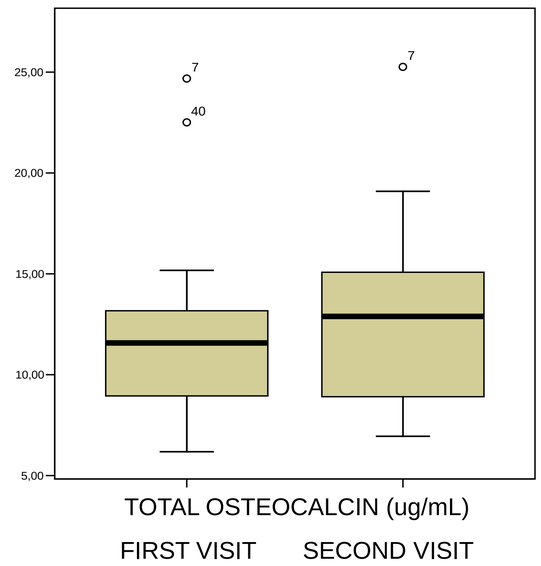
DATA ON FIRST VISIT

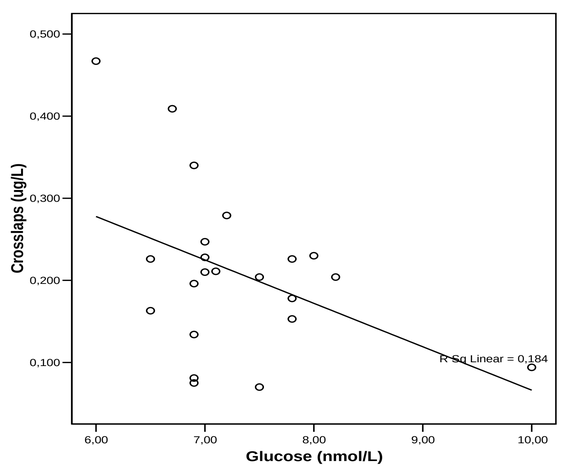
	N	MEDIAN	MIN	MAX
BMI	57	29.2	23.20	43.60
HbA1c (%)	57	8.0	6.30	12.00
GLUCOSE (nmol/L)	57	9.0	7.10	15.00
INSULIN (IU/L)	57	18.00	3.65	104.20
OSTEOCALCIN TOTAL (ug/mL)	57	11.8	6.18	34.40
UNDERCARBOXYLATED OSTEOCALCIN (ng/mL)	57	1.9	0.14	6.72
CROSSLAPS (ug/mL)	57	0.191	0.060	0.600

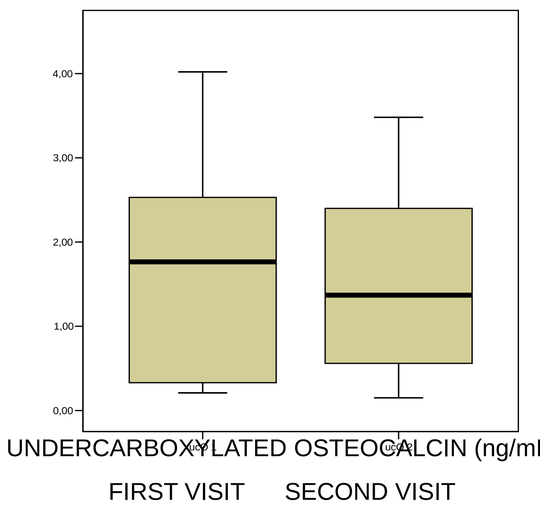
DATA ON CONTROL VISIT – AFTER 3 MONTHS

	N	MEDIAN	MIN	MAX
BMI	47	28.7	22.60	41.00
HbA1c	47	6.5	5.00	9.90
GLUCOSE	44	7.0	6.00	10.00
INSULIN	23	21.5	3.65	104.20
OSTEOCALCIN TOTAL	22	12.9	6.95	25.26
UNDERCARBOXYLATED OSTEOCALCIN	22	1.4	0.15	3.48
CROSSLAPS	22	0.207	0.070	0.467









CONCLUSIONS:

CHANGES OF OSTEOCALCIN AND UNDERCARBOXYLATED OSTEOCALCIN WITH IMPROVEMENT OF GYLCEMIA WERE NOT FOUND AFTER THREE MONTHS, ALTHOUGH OPTIMIZATION OF HbA1c GOAL (≤ 6.5%) WAS ACHIEVED SOLELY BY LIFESTYLE ADVICE.
AT THE SECOND VISIT INTERESTING NEGATIVE CORRELATIONS OF GLUCOSE WITH OSTEOCALCIN AND ALSO CROSSLAPS AS GLYCEMIC OPTIMIZATION WERE OBSERVED. THIS MIGHT INDICATE THE ASSOCIATION OF GLUCOSE AND BONE METABOLISM. CORRESPONDING RELATIONSHIP OF CROSSLAPS AND GLUCOSE REFLECTS COUPLING OF BONE TURNOVER ACTIONS, AS BOTH OSTEOCALCIN AND CROSSLAPS CORRELATED WITH GLUCOSE IN A NEGATIVE FASHION.