Investigating the bone metabolic parameters and serum 25-hydroxyvitamin D levels in male patients with asymptomatic hyperuricemia

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INTRODUCTION

Over the past few years the clinical relevance of **serum uric acid level** has changed. The elevated serum uric acid level not only **impairs the joints and the kidney function** but it is also linked with **an increased risk of cardivascular diseases**.

The aim of our study was to examine how bones are affected (change of bone mineral density, bone metabolism parameters, serum 25-hydroxyvitamin D levels and frequency of fractures) by elevated serum uric acid level.

MATERIALS AND METHODS

We investigated a total of **136 patients** divided into two groups according to serum uric acid level: **68 male patients with** (age: 54.9±1.6 years) and **68 male patients without** (age: 55.2 ±1,9 years) **hyperuricemia**. In all cases hyperuricemia (se level >416 umol/l) was **asymptomatic**.
Bone mineral density (BMD) was measured by dual-energy X-ray absorptiometry (DEXA), for bone markers such as: **parathyroid hormone** (PTH), **β-CrossLaps**, **25-(OH) vitamin D3** and **osteocalcin** (OC) electrochemiluminescence immunoassay were used and **routine labor parameters** were measured. **Medical history** including prevalence of bone fractures was also recorded. Statistical analysis was performed by ANOVA, with post-hoc Bonferroni correction. (Satistica software 9.0)

	Se Ca	Se P	Se Mg	Se alk. phos	Se creat	PTH	25OH D3vit	Osteo calcin	TSH	Beta-Coss laps	Se uric acid	Se blood sugar	Se prot.
Hyper uric.	**2.41** ±0.07	1.23 ±0.12	0.82 ±0.1	229.44 ±69	89.69 ±21.2	**63.91** ±16.7 *	**48.4** ±15.1 *	**34.59** ±6.33 *	1.2 ± 0.61	**473.18** ±106.54*	**456.4** ±16.30 *	4.97 ±0.48	74.88 ±0.73
NO Hyper uric.	**2.44** ±0.09	1.08 ± 0.14	0.858 ±0.2	209.55 ±73	79.18 ±18.7	**38.43 ±** 11.65 *	**55.86** ±16.7 *	**29.46** ±5.67 *	1.8 ± 0.78	**352.58** ±110.4*	**299.51** ±14.0 *	4.88 ±0.69	75.19 ±0.61
Norm Range	2.25-2.61 mmol/l	0.85-1.45 mmol/l	0.7-1.3 mmol/l	90-290 IU/l	44-106 µmol/	10-65 pg/ml	Above 75 nmol/l	12-41 ng/ml	0.49-4.67 mIU/l	25-573 pg/ml	<416 umol/l	3.5-6.1 mmol/l	60-80 g/l

* <0.05

Patients	Age (yrs)±SD	Weight (kg) ±SD	Height (m) ±SD	BMI (kg/m²) ±SD (n:18.5-24.9Kg/m2)
Hyperuric. n=68	54.9±1.6	84.18±7.51	1.76±0. 074 *	27.05±2.20 *
NO Hyperuric. n=68	55.2 ±1.9	85.92±6.4	1.82±0.056 *	25.83±2.56 *

	L2-4 Zsc ±SD	L2-4 Tsc±SD	Lumbar Zsc ±SD	Femoral Tsc ±SD	Fractures
Hyperuric. n=68	-1.11±0.15*	**-2.53±0.20** *	-1.07±0.11*	**-2.45 ±0.16***	17~ **25%**
NO Hyperuric. n=68	–0.48±0.15*	**–1.91±0.20***	–0.61±0.1 *	**-1.98 ±0.15***	7 **~10%**

* <0.05

RESULTS

In patients with asymptomatic hyperuricemia lumbar spine (L2-4) BMD (T-score: -2.53±0.20 vs –1.91±0.20, p<0.05) **and left femoral neck BMD** (T-sc: -2.45 ± 0.16 vs -1.98 ±0.15, p<0.05) **were lower** than in patients without hyperuricemia. **Serum 25-(OH) vitamin D3 levels were also lower in the hyperuricemic group** (48.4 nmol/l ±15.1 vs 55.86 nmol/l ±16.7, p<0.05). **Bone fracture had occurred in 17 of 68 hyperuricemic patients**, while in the non-hyperuricemic group only 7 fractures were recorded.

CONCLUSIONS

The in-time recognition and treatment of elevated serum uric acid level could positively influnce the bone metabolism and be part of fracture prevention.

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