

EVALUATION OF CALCIUM AND VITAMIN D DISORDERS: CASE REPORT OF TWO PATIENTS

Andreja Maric

County Hospital Cakovec, Cakovec, Croatia



INTRODUCTION

Differential diagnosis of hypocalcemia is extensive, and careful diagnostic algorithm should be performed to adequately treat hypocalcemic disorders.

Laboratory test	Patient's value	Refferent values
Total ALP	297 U/L	< 119 U/L
Total serum calcium	1.8 mmol/L	2.2-2.63 mmol/L
Ionizing calcium	0.56 mmol/L	1.1-1.32 mmol/L
Urinary calcium	0.2 mmol/dU	2.5-7.5 mmol/dU
Serum phosphate	0.81 mmol/L	0.79-1.42 mmol/L
Vitamin D 25(OH)	34 nmol/L	> 75 nmol/L
PTH	44.3 pmol/L	1-6 pmol/L
osteocalcin	86.71 g/L	15-46 g/L
Beta crosslaps	1.5 g/L	< 1.008 g/L

Fig.1. The first patient with hypocalcemia

Laboratory test	Patient's value	Refferent values
Total ALP	360 U/L	< 119 U/L
Total serum calcium	1.97 mmol/L	2.2-2.63 mmol/L
Ionizing calcium	0.66 mmol/L	1.1-1.32 mmol/L
Urinary calcium	0.5 mmol/dU	2.5-7.5 mmol/dU
Serum phosphate	0.46 mmol/L	0.79-1.42 mmol/L
Vitamin D 25(OH)	9.3 nmol/L	> 75 nmol/L
PTH	21.3 pmol/L	1-6 pmol/L
TSH	7.72 mIU/L	0.54-4.87 mIU/L

Fig.2. The patient with hypocalcemia and hypothyroidism

CASE REPORTS

Two female patients with hypocalcemia are presented. The first one was 49 years old, postmenopausal, admitted to hospital due to weakness, hampered mobility and bone pain (hips, thorax). Six years ago she was hospitalized due to chronic renal failure, osteoporosis, fractures of hip neck and both pubic bones, but did not take any medication. Current diagnostic procedures revealed several rib fractures on X-ray, and laboratory tests (Fig.1) showed: iron deficiency (1.9 umol/L), microcytic anemia (Hgb 56.8 g/L, MCV 65.8 fL), urea (15.6 mmol/L) and creatinine (138 umol/L) elevated, high alkaline phosphatase (297 U/L), low total serum phosphate (0.81 mmol/L), low vitamin D (34 nmol/L), low vitamin B12 (98 pmol/L), and high PTH (44,3 pmol/L) and bone markers. Densitometry (DXA) showed characteristics for severe osteoporosis (L1-L4 T score -5.8). The diagnosis of **osteomalacia** was made, and therapy with calcitriol (0.25 mcg BID), calcium (CaCO₃ 3x1 gr/day), vitamin B12 and folate was introduced, with significant clinical and laboratory improvement.

The other patient was 39 years old, admitted due to chronic bone pain and suspected bone metastases on scintigraphy. Medical history revealed cerebral palsy, epilepsy and chronic gastritis. Diagnostic evaluation did not confirmed malignant disease, but hypocalcemia (1.97 mmol/L) and hypophosphatemia (0.46 mmol/L) were found (Fig.2). TSH (7.72 mIU/L) and PTH (21.3 pmol/L) were increased, with low vitamin D (9.3 nmol/L) and high alkaline phosphatase (360 U/L). DXA showed low bone mineral density (L1-L4 T score -2.9). Final discharge diagnosis were **osteomalacia**, hypothyroidism and megaloblastic anemia. Calcium (CaCO₃ 1 gr) and vitamin D replacement therapy (4000-6000 U per day) were started, with clinical and laboratory tests improvement.

CONCLUSION

Calcium, PTH and vitamin D disorders require detailed medical history, diagnostic evaluation and differential diagnosis. Adequate therapy, monitoring and follow up guarantee well treated and satisfied patient.

Recommendations for vitamin D replacement therapy depend on causes of osteomalacia: for chronic renal failure, hypoparathyroidism and hereditary vitamin D-dependent rickets calcitriol should be prescribed, and for other causes (e.g. Vitamin D malabsorption due to anticonvulsant therapy, megaloblastic anemia) cholecalciferol will be introduced in therapy.

References

- 1) Holick MF, Binkley NC, Bischoff-Ferrari HE, et al. Guidelines for preventing and treating vitamin D deficiency and insufficiency revisited. *J Clin Endocrinol Metab*, 2012, 97(4):1153-8.
- 2) <http://www.uptodate.com/contents/osteomalacia/hypocalcemia>

