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EP294

May the polymorphism of low molecular weight protein tyrosine phosphatase modulate metabolic and bone remodelling parameters associated with osteoporosis?

Joana Freitas[1,2], Cristina Monteiro[3], Ana Paula Barbosa[2,4], Fátima Batista[3], Maria José Laires[3], Manuel Bicho[1,2] & Mário Rui Mascarenhas[2,5]
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Aims
To study the association of protein tyrosine phosphatase (LMW–PTP/ACP1) polymorphism with bone mineral density and metabolic parameters of bone remodelling.
Methods
BMD (g/cm^2) was measured by DEXA in 760 subjects: 448 normal BMD (359F/89M; 49.7 ± 12.9 years; $30.2 \pm 5.4\ kg/m^2$) and 312 osteoporosis (265F/47M; 63.9 ± 10.4 years; $27.16 \pm 4.4\ kg/m^2$). Metabolic bone remodelling parameters were analyzed: LDL, HDL, total cholesterol, triglycerides, HOMA, alkaline phosphatase (AP), and osteocalcin. ACP1 activity was measured by spectrophotometry. ACP1 polymorphism was evaluated by PCR.
Results
Association was found between the genetic polymorphism of ACP1 and its enzymatic activity with higher values for genotypes AC + BC, intermediate values for BB and lower values for AA + AB. Osteoporosis: i) increased LDL, total cholesterol, AP, osteocalcin and ACP1, and decreased HOMA; ii) association between genotypes BB + BC + AC and increased total cholesterol, LDL, and ACP1; and iii) positive correlation between AP and LDL, total cholesterol, and osteocalcin. Normal BMD: i) association between genotypes BB + BC + AC (intermediate and higher ACP1 activity) and increased ACP1 and decreased AP and ii) positive correlation between AP and osteocalcin and HOMA. Only correlations of AP with LDL and total cholesterol remained significant when analyzed separately AA + AB individuals.
Conclusion
In osteoporosis, ACP1 polymorphism appears to modulate some metabolic parameters associated with a decrease in BMD, including total cholesterol, LDL, and ACP1 activity.

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EP295

Pancreatitis in familial hypocalciuric hypercalcaemia

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Familial hypocalciuric hypercalcaemia (FHH) is a characteristically asymptomatic condition that is caused principally by calcium sensing receptor gene (CASR) mutations and less frequently by GNA11 or AP2S1 mutations. We report a case of recurrent symptomatic pancreatitis in an FHH patient. The 17-year-old patient was hospitalized with abdominal pain and raised pancreatic enzymes due to acute pancreatitis. The only predisposing factor on investigation was a very elevated serum calcium level (3.3 mmol/l; NR: 2.15–2.60). This was associated with concomitantly moderately elevated PTH (33 ng/l; NR: 4–26), normal 25-OH vitamin D (44 ng/ml; NR: 30–80), elevated $1,25(OH)_2$ vitamin D (133 pg/ml; NR: 23–109), and undetectable urinary calcium. Family history revealed that the patient's grandmother was also known to suffer from hypocalciuric hypercalcaemia, and that hypercalcaemia had been found in the patient's mother, uncle, brother and sister. CASR sequencing revealed the patient (and family members) to be heterozygotic for a R185Q mutation, previously suggested to be a dominant negative mutation and leads to higher calcium levels than other known CASR mutations. Cinacalcet treatment lowered serum calcium to 2.95 mmol/l and the patient has not presented new pancreatitis episodes.

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EP296

Giant parathyroid adenoma with severe hypercalcaemia: case report

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Introduction
Parathyroid adenomas are the main cause of primary hyperparathyroidism. They are usually small – weighing <1 g – and not easy to find – requiring meticulous imaging studies for localisation. Giant adenomas are uncommon; large tumours and high levels of PTH raise the suspicion of parathyroid malignancy.
Case presentation
A 68-year-old female presented in our clinic with polydipsia, poliuria, nausea, weight loss, and extreme muscular weakness – she wasn't able to walk – and depressive mood. Clinical exam revealed dehydration and right cervical mass. Calcium was 21 mg/dl and PTH was 2238 pg/ml. The patient was also vitamin D deficient – 25OH vitamin D 14 μg/l. Radiographic study showed fracture of the first lumbar vertebra, CT scan showed multiple osteolytic areas of the skull. Osteodensitometry demonstrated osteoporosis (lumbar spine T score -2.9 S.D. and distal radius T score -6.7 S.D.). Ultrasonography revealed a hypoechoic inhomogeneous mass, 38/30/45 mm, laterally and caudally to the right thyroid lobe. Parathyroid scintigraphy (99Tc-MIBI) demonstrated a large area of high uptake in that region. The patient received intravenous fluids, loop diuretic, i.v. bisphosphonate (zoledronate) and calcitonin to reduce the level of calcium, then she was successfully operated. Calcemia dropped after surgery and it was managed with i.v. calcium and alpha calcidol. Mild hypocalcemia persisted for more than 6 months thereafter and so did the high levels of PTH, that raised to 506.5 pg/ml, then returned to normal – the hungry bones syndrome. The pathologic diagnosis was benign parathyroid tumour – parathyroid adenoma.
Conclusions
This is a rare case of giant parathyroid adenoma. The peculiarities of the case are the size of the tumour, the very high level of calcium and PTH – suggesting a malignant tumour, and the persistence of high levels of PTH and hypocalcemia months after surgery.

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EP297

Primary hypoparathyroidism is common in adult patients with β-thalassemia and protect patients from osteoporosis

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Introduction
β-thalassemia (bT) is associated to several endocrine abnormalities mainly due to iron overload. With the increase in bT-patients life expectancy, due to progresses in iron chelation therapy, more patients enter into adulthood than in the past and the prevalence of endocrine diseases is being reconsidered. The aim of the study is to investigate the prevalence of primary hypoparathyroidism (pHPT) in adult bT-patients and to characterize the relative clinical phenotype with particular regard to bone health.
Methods
We enrolled 26 adult patients with major or intermedia bT (12M and 14F; mean age ± S.D. of 38.1 ± 7.5 years). Serum PTH, 25-hydroxyvitamin D (25OHD), calcium, phosphorous, albumin, bone turnover markers, and bone mineral density (BMD) by dual-energy X-ray absorptiometry (Hologic) at lumbar and femoral site were measured.

Results
pHPT (PTH <15 pg/ml) was found in seven of the 26 patients (27%). Of them, four patients (57%) had hypocalcemia and two were on chronic calcium therapy. Lumbar BMD was significantly higher in patients with pHPT (0.884 ± 0.189 g/cm^2) than in patients without pHPT (0.731 ± 0.124 g/cm^2) ($P=0.023$). No significant difference was found in femoral BMD, even though a trend for higher BMD was present in pHPT (0.704 ± 0.117 vs 0.670 ± 0.143 g/cm^2 in pHPT and no-pHPT respectively) ($P=0.578$). The prevalence of osteoporosis was higher in patients without pHPT (68%) than in patients with pHPT (29%). Two patients had a history of bone osteoporotic fractures and both of them did not present pHPT. Bone turnover markers were no different in the two groups.
Conclusions
The prevalence of pHPT in adult bT-patients is higher if compared to that observed in pediatric bT-patients, the latter ranging from 8 to 11%. Moreover we found an higher prevalence of pHPT compared to that reported in literature on adult bT patients. As expected, pHPT seems to exert a protective role on the development of osteoporosis in these patients.

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EP298

Renal calcification in hypoparathyroid patients treated with calcium and vitamin D: can biochemistry help?

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Introduction
Hypoparathyroidism is most commonly observed following neck surgery and is characterized biochemically by deficient parathyroid hormone (PTH) and hypocalcaemia alongside hyperphosphataemia and reduced 1,25-dihydroxyvitamin D. Standard treatment with oral calcium and vitamin D aims to maintain serum calcium within the low-normal range whilst avoiding hypercalciuria due to over replacement. However, concerns remain over the presence of hypercalciuria and the associated risk of renal calcification.
Aim
To assess whether serum and urine biochemical parameters are associated with the presence of renal calcification in hypoparathyroid patients on Alfacalcidol therapy.
Method
A 12-month audit of the laboratory database was undertaken of paired requests for 24-h urine calcium (24 h-Ca), spot calcium:creatinine ratio (Ca:Creat), serum calcium, phosphate, urea, and creatinine. A review of case notes was performed to confirm aetiology of hypoparathyroidism, Alfacalcidol dose and results of renal ultrasound scan (USS).
Results
A total of 34 patients were identified as having hypoparathyroidism and receiving Alfacalcidol therapy. 24 h-Ca and Ca:Creat were not-normally distributed, however significant associations were found between 24 h-Ca and Ca:Creat when log-transformed (linear regression β-coefficient $=0.64$; 95% CI 0.36–0.92; $P<0.001$, $\beta=0.63$). 17 patients had documented hypercalciuria evidenced by elevated 24 h-Ca (five patients), Ca:Creat (eight patients), or both (four patients). 13 patients had undergone renal USS; four had evidence of renal calcification. Interestingly, these four patients each had an elevated Ca:Creat, in contrast with only one patient having elevated 24 h-Ca.No patient had hypercalcaemia. However, 20 patients had low, or low-normal serum adjusted calcium (Ca <2.2 mmol/l); nine of these patients having documented hypercalciuria evidenced by an elevated 24 h-Ca (78% of patients) or Ca:Creat (89% of patients).
Conclusion
Ca:Creat appears a sensible and convenient marker for the follow-up of patients on long term Alfacalcidol therapy to determine associated risk of renal calcification.

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EP299

Parathyroid tissue in ectopic thyroid tissue

João Silva, Catarina Ivo, Mafalda Marcelino, Dolores Passos, Hélder Simões, Luís Lopes & João Jácome de Castro
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Introduction
Postmortem studies have shown that a fifth parathyroid gland may be present in about 5% of patients with hyperparathyroidism. 1% of parathyroid glands are located in thyroid tissue. There's a prevalence of 7–10% of thyroid ectopic tissue.
Case report
A 53-year-old male, submitted to bilateral nephrectomy due to a Grawitz tumour at the age of 25. Under haemodialysis since then (with a rejected renal transplant in the past), he was recently referred to our department with a tertiary hyperparathyroidism diagnosis. Treated intra-hemodialysis with alfacalcidol 0.25 µg and cinacalcet. Analytically had a PTH 1604 pg/ml, calcium 9.5 mg/dl, phosphorus 5.6 mg/dl, and creatinine 11.4 mg/dl. Cervical ultrasound did not identify parathyroid gland and thyroid scintigraphy suggested parathyroid adenoma in the bottom right. PET-scan showed bone lesions suggestive of brown tumours. The patient was submitted to surgery and has removed four parathyroid glands (9–20 mm) with an histology of 'nodular hyperplasia of the parathyroid'. Was also removed a fifth nodule located in the lower left region with 9 mm, described as 'focus of parathyroid in parenchyma thyroid (intra-thyroid parathyroid?)'. Three months after surgery he's treated with 1 g of calcium carbonate $(3+3+3)$ and 0.25 µg calcitriol $(1+0+1)$, with PTH 139 pg/ml, calcium 8.2 mg/dl, and phosphorus 2.6 mg/dl.
Conclusions
In this patient despite scintigraphy suspicion of a functioning parathyroid adenoma, since it is a tertiary hyperparathyroidism, we chose surgical exploration with resection of all parathyroid glands. It was found a fifth focus of parathyroid tissue within an ectopic thyroid tissue. This case presents the association of three relatively rare situations: supernumerary parathyroid gland, in thyroid tissue in an ectopic location.

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EP300

Anti-diabetic treatment as an additional factor in a FRAX based evaluation of osteoporotic fracture risk

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Background
The present study is designed to assess the incidence of osteoporotic fractures and the associated risk factors and particularly those used to predict the 10-year fracture risk in FRAX score based on data gathered in general practitioner's records of rural Greece.
Patients and methods
We conducted a retrospective analysis of all patients with osteoporosis presented between October 2013 and December 2014. Data from medical records including gender, age, previous history of low energy fractures (spine, and distal radius), past medical history, and medication use with specific reference to treatment with bisphosphonates and glucocorticoids were obtained. Patients with metabolic bone disease other than osteoporosis were excluded from the final analysis.
Results
One hundred and sixty seven patients (127 women and 40 men) aged between 44 and 90 years old were included in the final analysis. Twenty-seven percent of the study population ($n=45$) had sustained a low energy fracture and only 43% of them had received anti-osteoporosis treatment. Regarding concomitant medications only anti-diabetic treatment was significantly associated with the presence of osteoporotic fracture ($F=4.260$, $P=0.042$), and had a considerable effect on the 10-year risk of major osteoporotic and hip fractures in drug-naïve patients.
Conclusion
Anti-diabetic treatment should be taken into consideration when evaluating fracture risk in osteoporotic patients.

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EP301

A giant parathyroid cyst manifesting with a neck mass and hypercalcaemic crisis

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