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Primary Hyperparathyroidism And Multiple Myeloma In A Patient With Sciatica-like Pain

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Abstract: *Hypercalcemia in clinical context of primary hyperparathyroidism and multiple myeloma is rare. We present female patient admitted to hospital for sciatica-like pain in the right leg. Atypical clinical presentation of sciatica, along with persistent and symptomatic hypercalcemia, raised suspicion on malignancy. She was diagnosed with multiple myeloma. Coexistence of two entities is observed before in literature. Parathyroid hormone is hypothesised as contributor of malignant plasmocytes and might be usefull marker in multiple myeloma pre-malignant states such as smoldering multiple myeloma (SMM) and monoclonal gammapathy of undetermined significance (MGUS).*

Keywords: *primary hyperparathyroidism, multiple myeloma, hypercalcemia.*

1. INTRODUCTION

Increased serum calcium concentrations are most commonly encountered in primary hyperparathyroidism and malignant disease. Hypercalcemia in malignant diseases is followed or precedes the onset of neoplasm. It is usually high and symptomatic with disorders of the nervous, gastrointestinal, kidney or cardiovascular system. The basic principle of treatment for hypercalcemic paraneoplastic syndrome is the treatment of malignant disease. Mechanisms of malignant hypercalcemia are different, characteristic of particular malignant disease and determine the choice of therapy (1).

2. CASE REPORT

A 76-year-old Caucasian female with anamnesis of hypertension, right mastectomy and chronic pyelonephritis was admitted to the hospital for an evaluation of a subacute, sciatica-like right leg pain. Symptoms on admission were significant for pain in the right leg: from gluteal region to heel, irradiating on posterior side; without disturbances in urination, defecation and upper legs sensibility. Family history was not significant. At the time of presentation, patient was using tramadole, dexasone, ketoprofen, antihypertensive medication and bromazepam. Recent laboratory findings showed elevated sedimentation rate (38 mm/h), chronic renal disease (urea 14.3 mmol/L; creatinine 154 umol/L, uric acid 382 umol/L), elevated calcium (3.03 mmol/L) and lowered phosphate (0.81 mmol/L). RTG of lumbosacral spine presented intervertebral stenosis on L4-L5 level. Vitals at the time of admission were: blood pressure 170/89 mmHg, pulse 82/min, ECG: sinus rhythm, PR 140msec, negative T-waves in lead aVL, QT/QTc 356/394 msec. Physical examination showed mild temporal disorientation, psychomotor retardation, dehydration, hypertension worsening and unconvincing signs of sciatica. Blood workup revealed elevated sedimentation rate (46 mm/h), hypercalcemia (2.99 mmol/L), stable azotemia (urea 10.41 mmol/L, creatinine 132 umol/L), lowered creatinine clearence 0.54 ml/S and urine pathology: trace of protein, positive proteins with sulphosalicylic acid and many bacteria in urine sediment. Urine test with sulphosalicylic acid raised suspicion on paraprotein presence. There were also red flags for sciatica-like leg pain: elevated sedimentation rate, hypercalcemia, age, atypical presentation, previous malignancy and first time sciatica-like symptoms in advanced age. RTG of dorsal spine showed generalised osteoporosis with compressive vertebral D7 fracture. Other RTG findings were not significant for lumbosacral and cervical spine, skull, pelvis and lungs. Skeletal survey did not show lytic lesions. Four days after admission she had first mental status worsening with agitation and moderate disorientation. Psychiatrist was consulted and introduced rispolept 1mg. Next day she had significant renal function worsening (urea 17.78 mmol/L, creatinine 180 umol/L) with mild hypercalcemia persistance (2.99 mmol/L). Her mental status was still worsening in way that she became uncommunicative with hypertonia of extremities, so urgent neurology was consulted. Multidetector CT presented no signs of cerebrovascular disease, except frontal region cavernoma, asymptomatic and without indications for surgery, as neurosurgeon was consulted. Patient had persistent hypercalcemia (3.20 mmol/L), about three times the upper level of intact PTH was measured (192) and rehydratation and diuretic therapy continued after endocrinologist consultation. Hematology service was consulted and bone marrow aspirate confirmed the diagnosis of stage II multiple myeloma. Bone marrow analysis showed hypocellularity (Cell 1/II) and hypocellular spicule, greatly infiltrated with patological plasmocytes. Hypercalcemia was managed with intravenous hydration, calcitonin, bisphosphonates and furosemide. The patient was also started on induction therapy for multiple myeloma with dexasone infusions.

3. DISCUSSION

The most common causes of hyperkalcemia are primary hyperparathyroidism and malignant disease (1). In our case there was a simultaneous presence of both entities, seldom observed in clinical practice, primary hyperparathyroidism and multiple myeloma (2). Hypercalcemia in multiple myeloma is most commonly due to osteolytic bone changes, that is due to local secretion of factors that mobilize calcium from the bones (3). In addition, in multiple myeloma, hypercalcemia may be overestimated as the paraprotein may give a false positive result which is important because of a therapeutic decision (4). It has been found that the co-existence of increased secretion of parathyroid hormone can stimulate the development of multiple myeloma by reducing apoptosis of malignant plasmocytes and the action of IL-6 (5,6).

In our patient, at the admission and during clinical course, the elements of hypercalcemia clinical presentation dominated: mental status changes, hypertension worsening, neuralgia and dehydration. Laboratory findings, done before admission, required the evaluation of hypercalcemia as part of an existing chronic renal disease. Chronic kidney disease was not at a stage that would lead to secondary or tertiary hyperparathyroidism. The finding of elevated calcium, a decreased phosphate and approximately 3 times higher parathyroid hormone level was in favor of primary hyperparathyroidism (7). There was also absence of shrinked kidneys and calcium deposition on ultrasound, although parathyroidectomy and histologic examination was not done so far. Due to suspicion of Bence Jones protein in urine, a cytological examination of the hematologist led to the final diagnosis of multiple myeloma.

After the diagnosis of multiple myeloma, the question arises as to whether mental status changes may have occurred at the expense of hyperviscosity syndrome and tramadol therapy also. An interesting point is the absence of osteolytic lesions in stage II multiple myeloma, whether there is a protective role of PTH secretion (8) since there is teriparatide therapy for osteoporosis or were bones changes under diagnosed (9)? Also we wonder whether there is potential significance of the presence of primary hyperparathyroidism in SMM or MGUS, because therapy for primary hyperparathyroidism could prevent multiple myeloma.

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