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ST VINCENT'S PATHOLOGY

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PTHrP INFORMATION SHEET

INTRODUCTION

Parathyroid hormone related peptide (PTHrP) is a protein produced by tumours which may lead to hypercalcaemia. The measurement of PTHrP can be of assistance in determining the cause of an otherwise unexplained hypercalcaemia.

PATHOPHYSIOLOGY

PTHrP is a protein secreted by some cancer cells leading to humeral hypercalcaemia of malignancy (HHM). PTHrP is produced commonly in patients with breast or prostate cancer and occasionally in patients with myeloma. PTHrP shares the same 13 N-terminal amino acids as parathyroid hormone (PTH), however the size and remaining amino acids are quite distinct. PTHrP is larger than PTH and contains between 139 and 173 amino acids compared to 84 for PTH.

PTHrP shares many actions with PTH leading to increased calcium release from bone, reduced renal calcium excretion and reduced renal phosphate reabsorption. However, PTHrP does not produce the normal anion gap metabolic acidosis commonly found with hyperparathyroidism.

PTHrP has important physiological roles in normal growth and development, particularly in the area of bone formation.

CLINICAL UTILITY

PTHrP measurement can assist with the identification of HHM. The usual pattern of HHM is elevated total and ionised calcium, low PTH (note that PTH may be within the lower section of the reference interval), and no other cause for the elevated calcium, eg exclusion of excessive vitamin D, sarcoid, TB and other causes. If the presence of a malignancy is uncertain, or there are several possible causes for the hypercalcaemia, measurement of PTHrP can be of assistance.