

# RGH Pharmacy E-Bulletin

Volume 28 (5): November 19, 2007

A joint initiative of the Patient Services Section and the Drug and Therapeutics Information Service of the Pharmacy Department, Repatriation General Hospital, Daw Park, South Australia. The RGH Pharmacy E-Bulletin is distributed in electronic format on a weekly basis, and aims to present concise, factual information on issues of current interest in therapeutics, drug safety and cost-effective use of medications.

Editor: Assoc. Prof. Chris Alderman, University of South Australia – Director of Pharmacy, RGH

© Pharmacy Department, Repatriation General Hospital, Daw Park, South Australia 5041

## Medication-associated hypercalcaemia

Hypercalcaemia is a metabolic abnormality that can range from an asymptomatic incidental finding through to extreme life-threatening clinical presentations. The major causes of hypercalcaemia are malignancy and primary hyperparathyroidism, accounting for 80% to 90% of cases. Medications can be another important cause that contributes to the presence of hypercalcaemia.

### *Vitamin D*

Vitamin D intoxication can occasionally occur and is characterized by hypercalcaemia. Hypercalcaemia is more common with the active form of calcitriol (1,25-dihydroxyvitamin D<sub>3</sub>) than with cholecalciferol (vitamin D<sub>3</sub>) or ergocalciferol (vitamin D<sub>2</sub>). Hypercalcaemia due to vitamin D is most commonly seen in patients with renal failure receiving vitamin D analogues. Elevated serum calcium and phosphate with an elevated serum 25-hydroxy (with vitamin D ingestion) or 1,25-dihydroxy vitamin D level, or a history of active vitamin D compound usage suggests hypercalcaemia due to vitamin D intoxication. The topical vitamin D analogue calcipotriol used for psoriasis can rarely cause hypercalcaemia. Hypervitaminosis A or the use of tretinoin (retinoic acid) for the treatment of acne and certain haematological malignancies can cause hypercalcaemia by increasing bone resorption.

### *Thiazides*

Thiazides have several metabolic effects that may contribute to increased calcium levels including the stimulation of renal tubular calcium reabsorption that is thought to be the most likely mechanism. Recent epidemiological research has examined the clinical spectrum of thiazide-associated hypercalcaemia. An increasing trend in incidence was noted in the last 10 years possibly due to the increased use of thiazides for the management of hypertension. The typical patients were women with mild, uncomplicated, and non-progressive hypercalcaemia that was discovered approximately 6 years after thiazide initiation. Approximately two-thirds of the patients with thiazide-associated hypercalcaemia had underlying primary hyperparathyroidism.

### *Others*

Lithium treatment may cause hypercalcaemia: a proposed mechanism is that lithium might alter the set point at which calcium suppresses the secretion of parathyroid hormone. Overtreatment with thyroxine and theophylline toxicity can cause mild hypercalcaemia. Milk-alkali or calcium-alkali syndrome is a form of hypercalcaemia caused by the ingestion of calcium and absorbable alkali. One US study, conducted between 1998–2003, found this to be the third-leading cause of hypercalcaemia among hospital patients without end-stage renal disease. Supplements containing calcium carbonate are taken for osteoporosis, peptic ulcer disease, gastritis, gastro-oesophageal reflux disease and chronic kidney disease. Hypercalcaemia with teriparatide (a recombinant formulation of parathyroid hormone used in the treatment of osteoporosis) is usually mild and transient.

Acknowledgment – This E-Bulletin is based on work by Dr Brian Simmons, DATIS, Pharmacy Department, RGH

**FOR FURTHER INFORMATION – CONTACT THE PHARMACY DEPARTMENT ON 82751763 or email: [chris.alderman@rgh.sa.gov.au](mailto:chris.alderman@rgh.sa.gov.au)**  
Information in this E-Bulletin is derived from critical analysis of available evidence – individual clinical circumstances should be considered when making treatment decisions. You are welcome to forward this E-bulletin by email to others you might feel would be interested, or to print the E-Bulletin for wider distribution. Reproduction of this material is permissible for purposes of individual study or research.