



Hypercalcaemia

Sept 2014

Normal Ca^{2+} 2.10 - 2.70 mmol/L

3.0-3.5 mmol/L = mild symptoms: ECG CHANGES start

3.5-3.8 mmol/L = weak, lethargic, confused, polyuria, polydipsia

>3.8 = stupor/coma

> 4.0 = cardiac arrest

Causes

>90% malignancy or hyperparathyroid

Spurious:

Hyperalbuminaemia, Sample after venous stasis (tourniquet)

PTH mediated:

- Primary hyperparathyroidism (usually adenoma)
- Tertiary hyperparathyroidism (after prolonged hypoCa secondary hyperparathyroidism)

Non-PTH mediated:

- Cancer – 1PTH-related protein (lung,breast,renal,myeloma,leukaemia). 1Vit D (lymphoma)
- Granulomatous conditions - sarcoidosis, TB
- Endocrine - thyrotoxicosis, phaeochromocytoma, acromegaly, 1° adrenal insufficiency
- Drugs - thiazides, vitamin D/A supplements, Li, oestrogens
- Familial - familial hypocalciuric hypercalcaemia
- Other - prolonged immobilisation, milk-alkali syndrome, AIDS

Presentation

General: anorexia, lethargy, dehydration, thirst/polydipsia, bone pain, calcinosis

GIT: nausea, vomiting, dyspepsia (gastrin), constipation, abdominal pain, pancreatitis

Neuromuscular: depression, muscle weakness, hyporeflexia, confusion, coma

Renal: inhibits ADH causing polyuria/polydipsia/dehydration; renal insufficiency, calculi, hyperK+

CVS: bradycardias, AV block, shortened QT interval, BBB, potentiates digoxin toxicity

Ectopic calcifications: cornea - band keratosis, conjunctiva, adrenals, renal tubules, arteries

Investigations

Urine: 24hr Ca^{2+}

Bloods: CMP, UEC, PTH, Vit D, LFT (Albumin, ALP)

Imaging: plain XR (primary Ca, mets, calculi), CT-KUB (calculi), USS/CT/Te scan parathyroids

ECG changes:

ST depression, Short QT, Wide T wave; Bradyarrhythmias, BBB - 2nd degree block - 3rd degree block

Ca^{2+} > 4.0 - ARREST

Management

iv fluids (aim UO ~100ml/hr)

+/- frusemide (for fluid overload)

Bisphosphonates (interferes with osteoclast function, more potent than calcitonin, takes few days to work)

Calcitonin (short lived) (incr Ca excretion, inhibit osteoclasts, works 4-6hrs, lowers Ca 0.25-0.5 mmol/L max)

Glucocorticoids (Incr urinary calcium excretion, Decr intestinal calcium absorption)

Dialysis if oliguric renal failure