Clinical update no. 554
4 March 2020

Case: 84yr-F, recently admitted for pulmonary oedema, complicated by an ischaemic stroke during admission which was managed conservatively. She had been fairly well since discharge but brought to ED because of a deterioration overnight, with drowsiness, abdominal pain and breathing difficulty. She had a myelodysplastic condition currently being investigated, having been picked up incidentally 4 months prior.

She was afebrile, BP 105/70, HR 85 bpm, tachypnoeic to 30 breaths/min with right sided creps, though O2 sats 94% on air. There was no pulmonary oedema on CXR and she improved. Abdomen was soft with some epigastric tenderness, and marked hepatosplenomegaly.

Hb 67, having been around 85 on recent admission, platelets 85. Of note WCC 137,000, predominantly neutrophils, having been 34,000 2 weeks prior during admission.

Other results included eGFR 24, lactate 7.

Abdominal CT showed a splenic infarct with no other intrabdominal pathology. CXR showed cardiomegaly with no focal changes or interstitial oedema.

Haematology thought there was acute leukaemic transformation. How does it relate to recent ischaemic stroke, splenic infarct and her deterioration? Should she be transfused? Should she be anticoagulated?

REVIEW ARTICLE

Diagnosis and Management of Oncologic Emergencies

Not that common, but need to know how to approach.

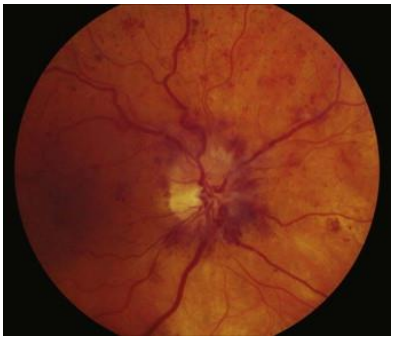
HYPERVISCOSITY SYNDROME

A rare but potentially catastrophic consequence of increased serum viscosity due to excess serum proteins, such as in macroglobulinaemia, multiple myeloma; or from cellular components, e.g. WBC in leukaemia, and polycythaemia. There is hypo-perfusion and end organ dysfunction mimicking other disease pathology, such visual changes (can be mistaken for stroke), dyspnoea (mistaken for pulmonary embolus or CCF), or altered mental status (mistaken for sepsis). The classic triad is mucosal or skin bleeding, visual changes, and focal neurologic deficits. It should be considered in any patient with WCC >100,000 or Hb approaching 20 g/dl associated with symptoms of hypoperfusion. Coagulopathy is common.

Blood transfusion can significantly worsen and should be avoided if possible.

Therapy is directed at decreasing serum viscosity through IV fluid, plasmapheresis, or leukopheresis. Phlebotomy (polycythaemia) or urgent chemotherapy (acute leukaemia) may be indicated.

Intervention helps relieve symptoms though does not alter disease course.

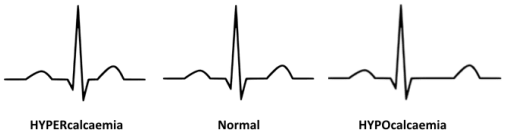


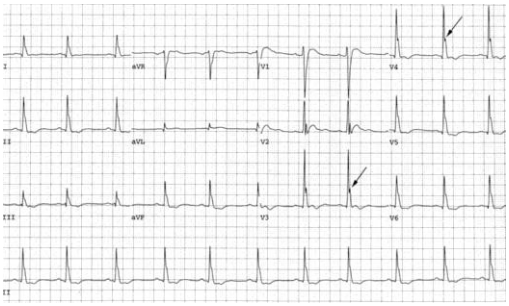
Ocular involvement in hyperviscosity syndrome with papilledema and haemorrhage.

Her clinical presentation seemed to fit, with confusion, splenic infarct, drowsiness, breathing difficulty, and recent stroke.

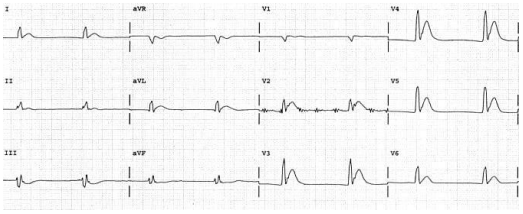
HYPERCALCEMIA OF MALIGNANCY

Hypercalcemia may be seen with any malignancy. 20% is secondary to bony metastases, and portends a poor prognosis. 80% can be attributed to parathyroid-related protein (PTHrP) activity, which increases bone resorption and also calcium resorption in the renal tubule. Symptoms are vague and often relate to significant volume depletion from osmotic diuresis.





Osborn waves in severe hypercalcaemia (4.1 mmol/L).



s. calcium 6.1 mmol/L; VF arrest soon after.

ECGs may show prolonged PR, widened QRS, shortened QT, and ventricular dysrhythmias.

Normal serum corrected calcium = 2.1 – 2.6 mmol/L
Mild hypercalcaemia = 2.7 – 2.9 mmol/L
Moderate hypercalcaemia = 3.0 – 3.4 mmol/L
Severe hypercalcaemia = greater than 3.4 mmol/L

Symptoms vary with acuteness of onset, and the same Ca level maybe better tolerated if a subacute rise. Higher levels risk complications and acute deterioration, including cardiac.

Initial intervention is IV fluid resuscitation to correct hypovolaemia and induce diuresis, giving crystalloid 1-2 L stat and then 250 ml/hr. Loop diuretics, e.g. frusemide, can reduce s Ca levels but should not be used acutely when hypovolaemic, and add little unless otherwise given for volume overload. High doses are required to be effective.

eTG complete
by Therapeutic Guidelines

Hypercalcaemia

sodium chloride 0.9% 4 to 6 litres by intravenous infusion over 24 hours.

Do not use frusemide for primary treatment.

Bisphosphonate infusion can temporarily lower the calcium concentration; give only after rehydration if inadequate response to fluids. Caution with renal failure; complications include self-limited fever.

zoledronic acid 4 mg by intravenous infusion over at least 15 minutes

OR

pamidronate 60 to 90 mg by intravenous infusion over 4 hours; starting dose depends on total serum calcium concentration corrected for albumin.

Hydrocortisone IV 200-300mg/day may benefit in malignancy (notably lymphoma), vitamin D toxicity or sarcoidosis.

Haemodialysis may be required if oliguric renal failure.

TUMOR LYSIS SYNDROME

Tumour lysis syndrome (TLS) is rare but has high mortality, and is seen mostly in haematological malignancy due to cell lysis and release of intracellular contents usually after chemotherapy but sometimes spontaneously in leukaemia. There may be hyperkalaemia, hyperphosphatemia, hypocalcaemia, and hyperuricemia. Test also for FBC, LDH, and do an ECG. There is release of phosphate, which binds with calcium and can lead to crystal deposition and hypocalcaemia.

Treatment is IV fluid and correction of electrolytes. Give IV calcium gluconate only if symptomatic from hypocalcaemia as otherwise risk Ca-Ph tissue precipitation. Phosphate binders include aluminium hydroxide. Allopurinol can prevent uric acid production but does not decrease elevated levels. Dialysis may be required.

NEUTROPENIC FEVER

Table 1. Degree of neutropenia.

Mild neutropenia	ANC 1000-1500
Moderate neutropenia	ANC 500-999
Severe neutropenia	ANC 100-499
Profound neutropenia	ANC < 100

ANC, absolute neutrophil count.

About 2/3 cases of fever have a non-infective basis. Bacterial causes are mostly GI (*E coli*), or *Staph/Strep* and *Pseudomonas*. Give antibiotics early based on local protocols and consult with oncology for disposition.