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HOT TIP
July 2023

Northern Health Palliative Care

Hypercalcemia of Malignancy

Causes	<p>Main mechanisms: Tumor secretion of parathyroid hormone-related protein (most common), osteolytic skeletal metastases</p> <p>Cancers associated with hypercalcemia: multiple myeloma (~40-50%), breast (~20%), lung (~20%), kidney, squamous cell cancers of head & neck, thyroid</p>
Diagnosis	<p>Hypercalcemia is defined as a corrected calcium greater than 2.6 mmol/L</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> $\text{Corrected Ca(mmol/L)} = \text{measured Ca(mmol/L)} + [0.02 \times (40 - \text{measured albumin(g/L)})]$ </div> <p>Severity: Mild: < 3 mmol/L Moderate: 3.0 – 3.5 mmol/L Severe: > 3.5 mmol/L</p>
Symptoms	<p>Neurological: fatigue, lethargy, confusion, delirium</p> <p>Gastrointestinal: nausea, vomiting, constipation, abdominal pain</p> <p>Cardiac: bradycardia, arrhythmias</p> <p>Renal: polyuria, polydipsia, dehydration, impaired renal function</p>
Interventions	<p>Identify and treat reversible causes</p> <ul style="list-style-type: none"> • Treat the underlying cause when possible and according to the goals of care • Discontinue drugs that promote hypercalcemia (thiazide diuretics, lithium, ranitidine, vitamin A, vitamin D, calcium supplements) <p>Hydration</p> <ul style="list-style-type: none"> • Adequate hydration lowers serum calcium by a median of 0.25 mmol/L • Mild cases: initiate oral hydration of at least 6-8 glasses of water/day • Moderate-severe cases: initiate NS 100-120mL/hr IV or by hypodermoclysis <p>Pharmacological</p> <p>IV Bisphosphonates (eg. pamidronate, zoledronic acid)</p> <ul style="list-style-type: none"> • Give if corrected Ca ≥ 3 or symptomatic and in line with goals of care • Long onset of action (~48 hrs) and long duration of action (3-6 weeks) • Don't give until fully rehydrated with adequate urine output • Contraindicated if creatinine >400 µmol/L or creatinine clearance <10 mL/min <p>IV Calcitonin</p> <ul style="list-style-type: none"> • Quick onset of action (~4 hrs) but becomes ineffective after 48 hours • Useful when rapid lowering of calcium is required • Needs to be given in combination with a bisphosphonate <p>*For dosing information refer to Northern Health Palliative Care Program Symptom Guidelines 4th ed.</p>

References:
Northern Health Palliative Care Program Symptom Guidelines 4th Edition (2019)
UpToDate: Treatment of Hypercalcemia