

## Palliative Care Tip – Issue#7: HYPERCALCEMIA OF MALIGNANCY / June, 2018

**Definition: Hypercalcemia (HyperCa<sup>++</sup>) = corrected Ca<sup>++</sup>>2.60 mmol/L**

**N.B.: corrected serum calcium = measured serum calcium + {(40 – measured serum albumin) x 0.02}**

### Causes:

- Occurs 20-30 % of cases in advanced cancer (solid and hematological) related to humoral hyperCa<sup>++</sup>, local release of cytokines, induced by 1,25-dihydroxyvitamin D, but most commonly by production of parathyroid hormone-related peptide (PT-HRP).
- Most commonly occurs in breast cancer, renal cell carcinomas, and squamous cell carcinomas.
- Less often related to increased gastrointestinal absorption of calcium or ectopic production of PTH itself.

### Clinical Features:

- Can be severe, difficult to manage and often presents insidiously
- Symptoms are often difficult to distinguish from those related to the underlying malignancy.
- Lethargy, anorexia, nausea, vomiting, thirst, polydipsia, constipation, dehydration.
- Cognitive difficulties, confusion, obtundation, and coma may occur.

### Treatment:

*Mild to moderate HyperCa<sup>++</sup> and minimal symptoms:*

- Rehydrate (Normal Saline; hypodermoclysis [HDC] at 100 mL/hr or IV at 100-120 mL/hr).
  - Recheck serum calcium in 24-48 hours – if HyperCa<sup>++</sup> persists, consider a bisphosphonate (see below).
- Severe HyperCa<sup>++</sup> (corrected serum Ca<sup>++</sup>>3.0 – 3.5 mmol/L) and/or very symptomatic:*
- First, rehydrate (Normal saline HDC at 100 mL/hr or IV at 100-300 mL/hr).
  - If renal function is normal, administer a bisphosphonates (see below) while hydrating.
  - In the absence of renal failure or heart failure, avoid loop diuretics because of potential complications
  - If renal function is impaired, hydrate first (as above), to correct pre-renal failure and consider administering Calcitonin (100-200 units subcut TID x 3-6 doses) to bridge to administration of a bisphosphonate. Consider this if symptoms are severe, and HyperCa<sup>++</sup> must be corrected quickly. (note: calcitonin's anti-hyperCa<sup>++</sup> effect diminishes in 24-48 hours).
  - Recheck serum calcium 3-4 days following bisphosphonate administration.

### Bisphosphonates:

- Renal failure is a relative contraindication to use of bisphosphonates, therefore, check electrolytes, urea and creatinine prior to administration. If pre-renal failure is present, rehydrate prior to use.

### Pamidronate – duration of effect 28 days

- Limitation: cannot be given subcutaneously.
- Cheapest of all the bisphosphonates
- Dose: Pamidronate 60-90 mg (if renal function normal, 90mg recommended) in 500-1000 mL NS or D5W to run over 4-6 hrs, intravenously.

### Clodronate – duration of effect 14 days

- Limitation: access has become limited, please check with local pharmacies/hospitals for availability
- If available, can be administered subcut. permitting home administration (monitor site for irritation)
- Dose: Clodronate 1500 mg subcut or IV in 500-1000 mL NS or D5W to run over 4-6 hrs.

### EDMONTON ZONE – PALLIATIVE AND END OF LIFE CARE

AUTHOR/REVIEWER: [ORIGINAL CONTRIBUTOR AND UPDATE: DOREEN ONESCHUK, MD. YOKO TARUMI, MD\* MEGAN SELICK, MD\*]; EDITOR: YOKO TARUMI, MD\* \* DIVISION OF PALLIATIVE CARE MEDICINE, DEPARTMENT OF ONCOLOGY, UNIVERSITY OF ALBERTA]

LAST REVISION DATE: [JUNE, 2018]

**Zoledronic Acid** – duration of effect 4 weeks

- Limitation: Intravenous route only
- 4 mg intravenously over 15 min. Superior to pamidronate in reversing HyperCa<sup>++</sup> related malignancy.
- 

**Denosumab** – duration of effect 4 weeks

- For severe, symptomatic HyperCa<sup>++</sup> related malignancy, refractory cases to zoledronic acid.
- *60 mg subcut with repeated dosing based on response or 120mg subcut, (cost may be lilted factor especially outpatient setting).*

**Special Notes**

- While treating the HyperCa<sup>++</sup> is a priority, also ensure symptoms resulting from it (agitation, restlessness, constipation) are symptomatically managed as well.
- If further concern for symptom management, consider consulting the Palliative Care Program (see Issue #23).