

# Management of Malignant Hypercalcaemia: Results of the AWSCS Network Audit

## BACKGROUND

- The ASWCS Network is made up of 6 hospital trusts, 6 Primary Care Trusts and 4 hospices. There are currently different local guidelines in place across the Network for the management of hypercalcaemia
- Hypercalcaemia (serum corrected calcium >2.7mmol/L) occurs in 10-20% patients with malignant disease (Saunders *et al* 2004)
- It most commonly occurs with multiple myeloma, breast, renal and squamous cell lung cancers
- Hypercalcaemia can be life threatening (Falk in ABC Pall Care, 1998)
- Symptoms are unpleasant but improve with treatment
- Bisphosphonates are the treatment of choice

## AUDIT OBJECTIVES

- To perform a retrospective case-note audit of patients with malignant hypercalcaemia looking at:
  - Hydration: were patients rehydrated?
  - Choice and dose of bisphosphonate
  - When serum calcium (Ca<sup>2+</sup>) and serum urea and electrolytes (U&Es) were rechecked pre- and post- treatment
- To audit agreed standards and produce unified guideline for the AWSCS Network.

## AUDIT STANDARDS

- Check Ca<sup>2+</sup> and U&Es
- If Ca<sup>2+</sup> <3mmol/L and patient asymptomatic, drink plenty/ rehydrate and recheck Ca<sup>2+</sup> in one week
- Rehydrate all patients before bisphosphonate
- If Ca<sup>2+</sup> ≥3mmol/L and/or symptomatic, give Pamidronate 60-90mg in 500ml 0.9% saline over 2 hours
- Avoid Pamidronate dose if Creatinine Clearance <30ml/min (or use eGFR); (use Ibandronate)
- Recheck U&Es after treatment
- Recheck Ca<sup>2+</sup> after treatment (but not before 3 days)
- If Ca<sup>2+</sup> remains elevated 5-7 days post-treatment, repeat same dose of Pamidronate
- If hypercalcaemia not responding to Pamidronate, use Zoledronate 4mg in 50ml 0.9% saline over 15mins
- Recheck Ca<sup>2+</sup> in 3 weeks

**TARGETS** Target 100% compliance for every standard

## METHODS

- Retrospective patient identification by lab records
- Examination of medical notes and drug charts
- Use of standardised data-collection form across the network

## RESULTS & OUTCOMES

Table 1: Summary of patient characteristics

Total Number of patients (N)	109
Site	
Hospital patient (5 sites)	59 (54%)
Hospice patient (5 sites)	50 (46%)
Serum corrected calcium (mean)	2.68 – 4.75 (3.05)
Ca <sup>2+</sup> ≥3mmol/L	47 (43%)
Ca <sup>2+</sup> <3mmol/L	62 (57%)
Recurrent hypercalcaemia	30 (28%)
Symptomatic hypercalcaemia	82 (75%)

Standard 1: Compliance 94%

- U&Es were only checked in 102/109 patients (94%).

Standard 2: Compliance 21%

- Ca<sup>2+</sup> <3mmol/L in 62/109 patients; asymptomatic in 19/62; IV rehydrated in 4/19 (21%). 4 given Pamidronate despite no symptoms.

Standard 3: Compliance 72%

- 21/76 (28%) were not given IV fluids before bisphosphonate

Standard 4: Compliance 33%

- 87 patients met criteria of Ca<sup>2+</sup> ≥3mmol/L and/or symptomatic
- 76/87 (87%) patients received a bisphosphonate. 9 of these patients received Zoledronate: 3 appropriately and 6 inappropriately.
- Of the 66 patients that received Pamidronate, 60 had a normal eGFR. Of these, 4 patients received a sub-therapeutic dose.

Standard 5: Compliance 71%

- 7 patients with eGFR<30 were still given Pamidronate

Standard 6: Compliance 83%

- 63/76 had U&Es checked after a bisphosphonate.

Standard 7: Compliance 46%

- Although 64/76 (84%) had Ca<sup>2+</sup> rechecked after bisphosphonate, only 35/76 (46%) had this done at the correct time (more than 3 days post-treatment).

Standard 8: Compliance 70%

- Ca<sup>2+</sup> remained high post-treatment in 18/76. 10 of these patients died. Of the remaining patients, 7/10 received repeat bisphosphonate.

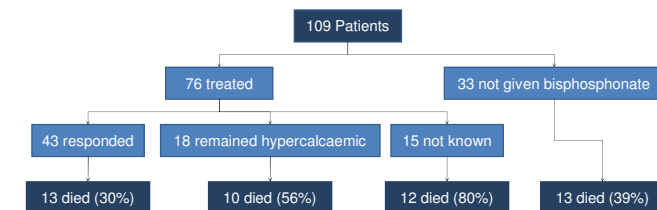
Standard 9: Compliance 100%

- Very difficult to determine, but of the 6 patients with recurrent hypercalcaemia, all received Zoledronate.

Standard 10: Compliance 18%

- Documented plan to recheck Ca<sup>2+</sup> in 3 weeks in 14/76 (or 16/109)
- But 48/76 (or 48/109) patients died.

Figure 1: Hypercalcaemia as an end-of-life event



- 63/76 treated patients (83%) were known to the Palliative care team.

## CONCLUSIONS & IMPLICATIONS

- Poor use of the correct drug / dose of bisphosphonate
- More caution needed if renal impairment
- Tendency to 'over-check' U&Es and Ca<sup>2+</sup> post-treatment
- As a result of this audit we will agree on a unified protocol across the network and educate staff appropriately.