# Hypocalcaemia and hypercalcaemia

## *Executive summary*

## Introduction

## Abnormalities in calcium levels are less common than other electrolyte disturbances. They are important to note as they often indicate a serious underlying condition. Calcium levels should always be corrected for the albumin level before being interpreted.

* Corrected Ca mmol/l = (0.02 x (40 – serum albumin)) + Ca

### Target users

* Doctors
* Nurses

### Target area of use

* Outpatient department
* Ward

### Key areas of focus / New additions / Changes

## This guideline outlines the correction of abnormal calcium levels.

## Limitations

## We do not keep bisphosphonates, but they are often available locally for purchase.

# Hypocalcaemia

This is defined as corrected serum calcium < 2.15 mmol/l. Mild hypocalcaemia is between 1.9 mmol/l and 2.14 mmol/l while moderate hypocalcaemia is between 1.5 mmol/l and 1.8 mmol/l. Severe hypocalcaemia is <1 .5 mmol/l.

## Causes

* Hypoparathyroidism
* Pancreatitis
* Sarcoidosis
* Hypomagnesaemia
* Hypophosphataemia
* Hypoalbuminemia
* Vitamin D deficiency
* Chronic Kidney disease

## Presenting symptoms and signs

* Perioral or finger paraesthesiae
* Tetany evidenced by the presence of:
  + Chvostek sign :Twitching of facial muscles in response to tapping over the area of the facial nerve
  + Trousseau’s sign: carpopedal spasm that results from ischemia, such as that induced by pressure applied to the upper arm from an inflated sphygmomanometer cuff
* Seizures

## Management

For mild to moderate hypocalcaemia and in chronic hypocalcaemia , oral therapy with effervescent or non-effervescent calcium carbonate tablets at 1000-1500 mg OD or BD should be prescribed with food.

Severe and symptomatic hypocalcaemia is treated with intravenous calcium gluconate infusion. IV 10% Calcium gluconate 20 mls in 100ml of 0.9% saline infusion over 20 minutes. Then 100 ml of 10% calcium gluconate in 900 ml of 0.9% saline infusion at 50 ml/hr over the next 24 hours. Check serum calcium every 4 hours.

Treat underlying condition.

# Hypercalcaemia

This is defined as corrected serum calcium > 2.55 mmol/l. Mild hypercalcemia is from 2.56-2.59 mmol/l, moderate is 3.0-3.2 mmol/l, while severe is > 3.2 mmol/l. Hypercalcaemia can result in nephrolithiasis as well as renal failure.

## Causes

* Hyperparathyroidism
* Sarcoidosis
* Malignancies e.g multiple myeloma
* Hypervitaminosis D
* Hyperthyroidism

## Presenting symptoms and signs

These occur as hypercalcemia becomes more severe.

* Lethargy
* Weakness
* Confusion
* Coma
* Polyuria
* Nocturia
* Dehydration
* Constipation
* Nausea
* Anorexia
* Abdominal pains

## Management

Severe hypercalcaemia is a medical emergency and is corrected by rehydration with 0.9% saline at 60 ml/hr to as high as 200-300 ml/hr.

Bisphophonate therapy is required for severe hypercalcaemia. If the patient cannot afford this, then furosemide can be added to the treatment, but this may not be very effective.

Dialysis may be necessary.

For mild to moderate hypercalcaemia, dietary restriction and increased oral fluid intake is appropriate treatment.

## Key Issues for Nursing care

* Follow the fluid instructions very carefully.
* Make sure repeat tests are done on time and are reviewed by a doctor promptly.
* All patients with abnormal Ca levels should have strict monitoring of fluid input and output.

## References

Bartel B, Gau E. Fluid and Electrolyte Management. Critical Care Pharmacotherapeutics. Burlington, MA: Jones & Bartlett Learning. 2012 Feb 8:125-50.

Hoorn EJ, Tuut MK, Hoorntje SJ, van Saase JL, Zietse R, Geers AB. Dutch guideline for the management of electrolyte disorders-2012 revision. Neth J Med. 2013 Apr 1;71(3):153-65.

Kraft MD, Btaiche IF, Sacks GS, Kudsk KA. Treatment of electrolyte disorders in adult patients in the intensive care unit. American Journal of Health-System Pharmacy. 2005 Aug 15;62(16):1663-82.

|  |  |  |
| --- | --- | --- |
| **Written by:** | Orighomisan Agboghoroma | Date: 07 January 2019 |
| **Reviewed by:** | Karen Forrest | Date: 09 May 2019 |
| **Version:** | **Change history:** | **Review due date:** |
| 1.0 | New document | 31 May 2021 |
| Review Comments (*if applicable)* |  |  |