

A case of persistent hypocalcemia

HOSP #	MRN63985901	WARD	Medical Ward
CONSULTANT	Dr. Heleen Vreede	DOB/AGE	51 year Female

Abnormal Result

Test Set	Staff Notes	Test Item	Result	Units	Normal Values	Previous Result 1	Previous Result 2	Previous Result 3	Previous Result 4	Previous Result 5
NA		Sodium	136	mmol/L	136 - 145	140 08/03/2020 08:50	140 06/03/2020 ?	139 24/01/2020 11:30	143 15/11/2019 10:25	140 23/08/2019 13
K		Potassium	3.8	mmol/L	3.5 - 5.1	4.7 08/03/2020 08:50	4.2 06/03/2020 ?	3.9 24/01/2020 11:30	5.3 15/11/2019 10:25	4.4 23/08/2019 13
UREA		Urea	8.8	mmol/L	2.1 - 7.1	9.7 08/03/2020 08:50	8.0 06/03/2020 ?	8.2 24/01/2020 11:30	7.5 15/11/2019 10:25	4.6 23/08/2019 13
CRT		Creatinine	102	umol/L	49 - 90	120 08/03/2020 08:50	95 06/03/2020 ?	134 24/01/2020 11:30	115 15/11/2019 10:25	54 23/08/2019 13
		MDRD formula	50	mL/min/1.73		41 08/03/2020 08:50	54 06/03/2020 ?	36 24/01/2020 11:30	43 15/11/2019 10:25	>60 23/08/2019 13
		CKD-EPI formula	55	mL/min/1.73		45 08/03/2020 08:50	60 06/03/2020 ?			
		Creatinine plus auto co	CM			CM 08/03/2020 08:50	CM 06/03/2020 ?	MDRD1 24/01/2020 11:30	MDRD1 15/11/2019 10:25	MDRD1 23/08/2019 13
CA	✓	Calcium	1.47	mmol/L	2.15 - 2.50	1.53 08/03/2020 08:50	1.55 06/03/2020 ?	1.44 24/01/2020 11:30	1.72 15/11/2019 10:25	1.80 23/08/2019 13
		Corrected calcium		mmol/L	2.15 - 2.55					
MG		Magnesium	0.53	mmol/L	0.63 - 1.05	0.54 08/03/2020 08:50	0.67 06/03/2020 ?	0.47 24/01/2020 11:30	0.52 15/11/2019 10:25	0.65 23/08/2019 13
PD4		Inorganic phosphate	0.94	mmol/L	0.78 - 1.42	1.01 08/03/2020 08:50	0.99 06/03/2020 ?	1.14 24/01/2020 11:30	1.53 15/11/2019 10:25	1.40 23/08/2019 13
SIND		Serum haemoglobin inc	0			0 08/03/2020 08:50	0 06/03/2020 ?	0 24/01/2020 11:30	0 15/11/2019 10:25	0 23/08/2019 13
		Serum bilirubin index	0			0 08/03/2020 08:50	0 06/03/2020 ?	0 24/01/2020 11:30	0 15/11/2019 10:25	0 23/08/2019 13
		Serum lipaemia index	0			0 08/03/2020 08:50	0 06/03/2020 ?	0 24/01/2020 11:30	0 15/11/2019 10:25	0 23/08/2019 13
		Serum haemoglobin va	16.00			13.00 08/03/2020 08:50	15.00 06/03/2020 ?	7.00 24/01/2020 11:30	12.00 15/11/2019 10:25	7.00 23/08/2019 13
		Serum bilirubin value	0.00			0.00 08/03/2020 08:50	0.00 06/03/2020 ?	0.00 24/01/2020 11:30	0.00 15/11/2019 10:25	0.00 23/08/2019 13
		Serum lipaemia value	2.00			12.00 08/03/2020 08:50	13.00 06/03/2020 ?	0.00 24/01/2020 11:30	8.00 15/11/2019 10:25	9.00 23/08/2019 13
PHONC		Date phoned				24/01/2020				

Total calcium of 1.47 mmol/L (2.15 – 2.50)

Presenting Complaint

The patient has been having persistent hypocalcemia despite supplementation with calcium.

History

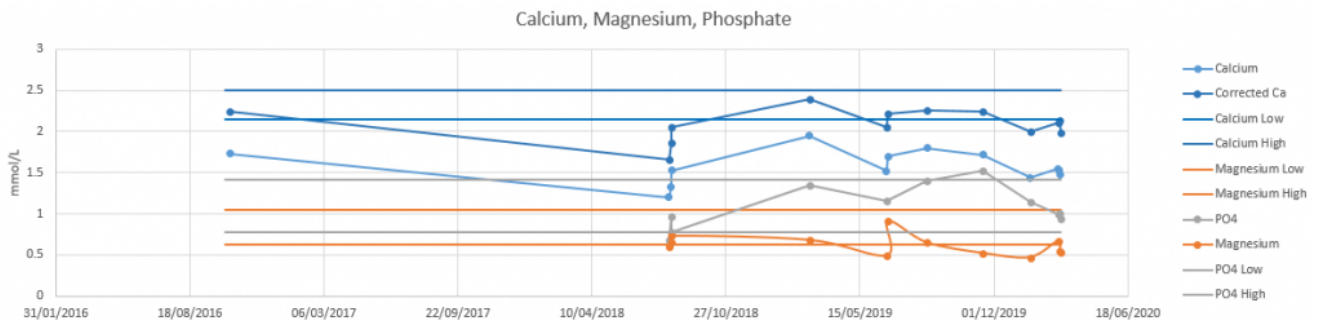


Figure 1 – Illustration of the patient's CMP over time: Calcium: blue; Magnesium: orange; Phosphate: grey
Reference ranges are the horizontal lines without dotted markers

Examination

Not available.

The typical findings in a patient with true hypocalcemia (low ionised calcium) are

Trousseau's sign

Chvostek's sign

Laboratory Investigations

Arguably, the first important consideration in patients with low calcium is the albumin. The patient had a mean albumin of 12 g/L, significantly lower than normal (40-50g/L). Arguably, the calcium can be corrected with the well known Payne's formula to then be $1.47 + (0.02 \times (40-12)) = 2.03$ mmol/L:

$$\text{Albumin-adjusted calcium (mmol/L)} = \text{total calcium (mmol/L)} + 0.02 [40 - \text{albumin (g/L)}]$$

Payne RB, Little AJ, Williams RB, Milner JP. Interpretation of serum calcium in patient with abnormal serum proteins. *Br Med J.* 1973;4:643-646. DOI: 10.1136/bmj.4.5893.643. ([View](#))

Measurement of serum intact parathyroid hormone (PTH) should be performed in all patients with hypocalcemia; it is the most valuable laboratory test for determining the etiology of hypocalcemia:

	2019/11/15	2019/06/28	2018/08/03
PTH (pmol/L)	21,8 H	15,5 H	25,8 H

Reference interval: (1.6-6.9 pmol/L)

Vitamin D

	09/09/2020	15/11/2019	03/08/2018
Total Vitamin D (25-OH VitD)	20.5 nmol/L	45.4 nmol/L	23.2 nmol/L

Guidelines for assessment of Vitamin D status:

<30 nmol/L <12 ng/mL Deficient

30-50 nmol/L 12-20 ng/mL Insufficient

>50 nmol/L >20 ng/mL Sufficient

125-150 nmol/L 50-60 ng/mL Safe upper limit

Reference: Revised South African Clinical Guideline for the diagnosis and management of osteoporosis (NOFSA 2017), endorsing the institute of Medicine Dietary Reference intakes for calcium and vitamin D (2010). Note regarding conversion of units:

Divide result in nmol/L by 2.496 to convert to ng/mL

Multiply result in ng/mL by 2.496 to convert to nmol/L

Other Investigations

Anti-Tissue Transglutaminase antibodies: **Negative**: repeated 3 months apart, with sufficient IgA levels in the serum): 0.9 & 0.8 U/mL (EliA c/o: 6.9)

Anti-Gliadin antibodies: **Equivocal**: 7.8 & 9.6 U/mL (EliA c/o: 6.9)

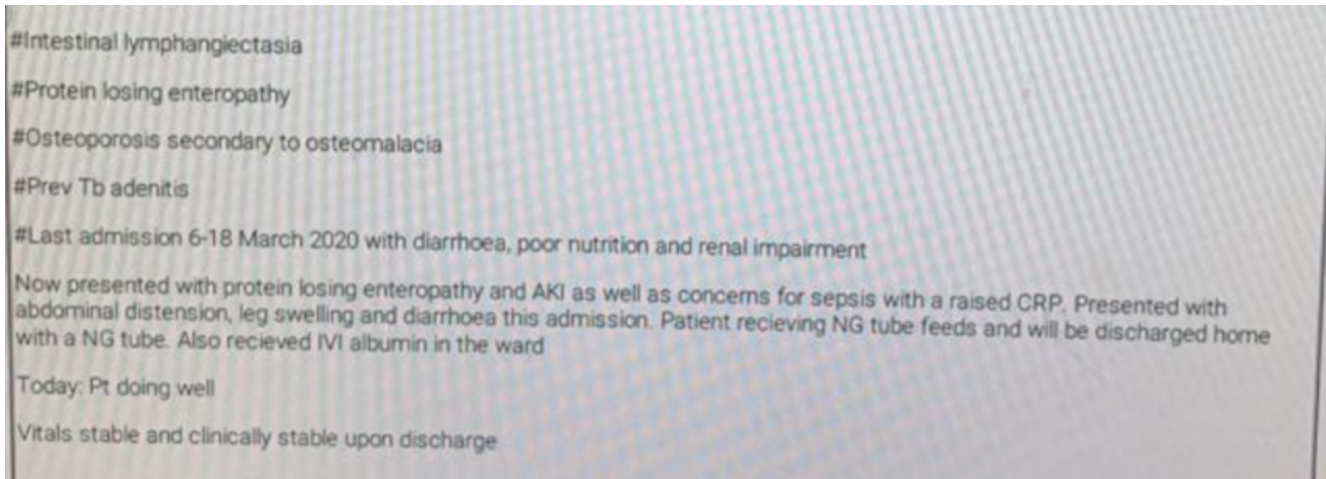
Anti-endomysial antibodies: **Negative**

HLA-DQ2: **Positive**

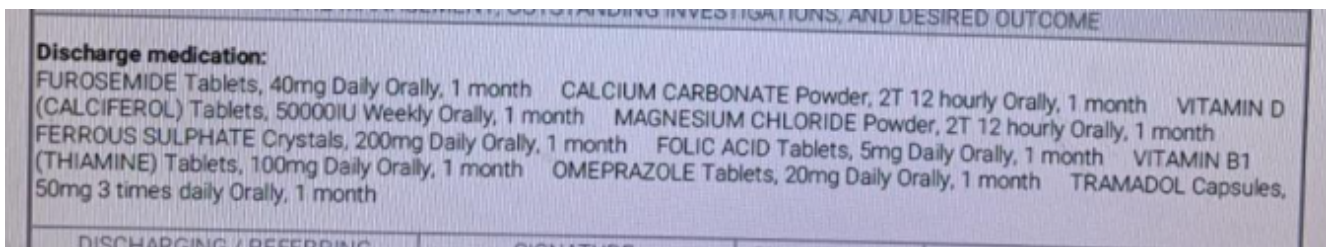
HLA-DQ8: **Negative**

Final Diagnosis

Hypocalcemia likely due to malabsorption (telangiectasia stated by the clinicians).



#Intestinal lymphangiectasia
#Protein losing enteropathy
#Osteoporosis secondary to osteomalacia
#Prev Tb adenitis
#Last admission 6-18 March 2020 with diarrhoea, poor nutrition and renal impairment
Now presented with protein losing enteropathy and AKI as well as concerns for sepsis with a raised CRP. Presented with abdominal distension, leg swelling and diarrhoea this admission. Patient receiving NG tube feeds and will be discharged home with a NG tube. Also received IVI albumin in the ward
Today: Pt doing well
Vitals stable and clinically stable upon discharge



Discharge medication:
FUROSEMIDE Tablets, 40mg Daily Orally, 1 month CALCIUM CARBONATE Powder, 2T 12 hourly Orally, 1 month VITAMIN D (CALCIFEROL) Tablets, 50000IU Weekly Orally, 1 month MAGNESIUM CHLORIDE Powder, 2T 12 hourly Orally, 1 month
FERROUS SULPHATE Crystals, 200mg Daily Orally, 1 month FOLIC ACID Tablets, 5mg Daily Orally, 1 month VITAMIN B1 (THIAMINE) Tablets, 100mg Daily Orally, 1 month OMEPRAZOLE Tablets, 20mg Daily Orally, 1 month TRAMADOL Capsules, 50mg 3 times daily Orally, 1 month

Take Home Message

According to International guidelines the following association is expected for patients with Coeliac Disease:

Positive for HLA-DQ2 (HLA-DQA1*05, DQB1*02)

Positive for HLA-DQ8 (HLA-DQA1*03, DQB1*03:02)

Considering the fact that the albumin was high with an increased PTH, the calcium very likely was physiologically also low (bioactive Ca). The Payne's formula also failed to correct the calcium to the normal reference range.

[Cumulative History:Download](#)