24. CoA trapping

Ward	Paeditric ICU	**D.O.B/Age**	11/03/2020
Consultant	Prof G. vd Watt		

Elevated propionic acid in the urine organic acid profile.

Fever with LRTI. ?COVID

Normal birth with no antenatal problems

#RVD exposed

Now:

#FTT

#LRTI. ?COVID

The patient presented with fever and LRTI which resolved after 3 -4 days of antibiotics. The patient then developed seizures with apnoeic attacks. The patient required intubation and ventilation and was transferred to ICU. The patient was noted to be having breakthrough seizures despite anticonvulsant therapy.

Further questioning revealed that the patient had become progressively drowsy with poor feeding.

Family history: No siblings noted to have had previous problem.

The patient was noted as not interacting with his environment.

CNS exam: Low GCS with upper motor neuron signs.

Other systems unremarkable.

pH	7.13 L		7.35 - 7.45
pCO2	2.99 L	kPa	4.66 - 6.38
pO2	19.90 H	kPa	11.04 - 14.36
Standard bicarbonate	9 L	mmol/L	22 - 26
Base excess	-21.6 L	mmol/L	-10.0 - -2.0
O2 saturation	100 H	%	94 - 98
Sodium	121 L	mmol/L	136 - 145
Potassium	4.4	mmol/L	3.5 - 4.5
Chloride	92 L	mmol/L	98 - 113
Glucose	13.3	mmol/L	
Ionised calcium	0.80	mmol/L	
Carboxyhaemoglobin	3.5	%	
Methaemoglobin	-1.7	%	

Authorised by NL Makhalima on 28/05/2020 at 16:42

Ammonia	1517 H	umol/L	40 - 80

Please note that preanalytical factors including a delay in sample reception and sample not transported on ice may cause raised ammonia results.

Trace lipaemia observed

Please repeate

Total cholesterol	1.90	mmol/L
Triglyceride	6.21	mmol/L
HDL cholesterol	0.18	mmol/L
LDL cholesterol	Triglyceride level too high [>4.5mmol/l] for LDL calculation	

CHOLESTEROL TREATMENT TARGETS (per CV Event Risk Category):

Risk Category:	TC target:	LDL-C target:
Low/Moderate Risk	<5.0 mmol/L	<3.0 mmol/L
High Risk	<4.5 mmol/L	<2.5 mmol/L

Authorised by KF Sephula on 28/05/2020 at 05:29

Calcium	1.24 L	mmol/L	2.12 - 2.64

Authorised by KF Sephula on 28/05/2020 at 05:29

Albumin	23 L	g/L	26 - 41

Authorised by NL Makhalima on 29/05/2020 at 14:07

Total bilirubin	5	umol/L	5 - 21

Authorised by NL Makhalima on 29/05/2020 at 14:07

Conjugated bilirubin (DBil)	2	umol/L	0 - 5

Authorised by NL Makhalima on 29/05/2020 at 17:52

Alanine transaminase (ALT)	106 H	U/L	1 - 25

Authorised by NL Makhalima on 29/05/2020 at 14:08

Aspartate transaminase (AST)	391 H	U/L	0 - 51

Authorised by NL Makhalima on 29/05/2020 at 14:08

Alkaline phosphatase (ALP)	382 H	U/L	75 - 316

Authorised by NL Makhalima on 29/05/2020 at 14:07

Gamma-glutamyl transferase (GGT)	44	U/L	12 - 122

Authorised by B Gool on 26/05/2020 at 16:35

CSF glucose	1.5	mmol/L	

CSF glucose reference range:

CSF glucose is normally 60 - 80% of plasma glucose, in samples taken within 15 minutes of each other.

Authorised by B Gool on 26/05/2020 at 16:35

CSF protein	1.62 H	g/L	0.20 - 0.80

Authorised by NL Makhalima on 26/05/2020 at 17:50

CSF adenosine deaminase	0.0	U/L

CSF ADA activity of > 6 U/L is suggestive of TB. However, other conditions such as bacterial or Cryptococcal meningitis may also produce elevated ADA levels.

CSF Analysis:

Appearance:

Clarity	Bloodstained	
Clots	Absent	

Cell Count:

Polymorphs	0	/uL
Lymphocytes	0	/uL
Erythrocytes	48	/uL

Authorised by NT Jikwana on 26/05/2020 at 14:53

Gram Stain:

Organisms	No bacteria observed

Authorised by MG Mpotje on 28/05/2020 at 09:07

Bacterial Culture:

No growth after 2 days

Authorised by NL Makhalima on 28/05/2020 at 16:45

White Cell Count	0.59 L	x 10^9/L	5.00 - 20.00
Red Cell Count	2.54 L	x 10^{12}/L	3.90 - 5.90
Haemoglobin	8.1 L	g/dL	12.0 - 21.8
Haematocrit	0.218 L	L/L	0.340 - 0.620
MCV	85.7 L	fL	88.0 - 126.0
MCH	31.7	pg	31.0 - 37.0
MCHC	37.0 H	g/dL	30.0 - 36.6
Red Cell Distribution Width	14.8	%	
Platelet Count	67 L	x 10^9/L	140 - 350
MPV	9.6	fL	7.0 - 11.4

Comment: Automated platelet count to be reviewed microscopically.

MCHC results may be affected by lipaemia

repeated tplateet = 71

FBC comment:

No clot detected in EDTA sample

Peripheral smear to be reviewed

CT brain may be useful in assess for organic neurological

cause.

Propionic acidaemia.

DDx: Biotinidase deficiency

Propionic acidaemia is an organic acidaemia characterized by deficiency of propionyl-CoA carboxylase. Propionyl-CoA carboxyalse converts propionyl-CoA to methylmalonyl-CoA. It is inherited in an autosomal recessive pattern. The metabolism of isoleucine, valine, threonine, and methionine produces propionyl-CoA. To a lesser degree, cholesterol and odd-chain fatty acids also contribute to propionyl-CoA levels. Affected individuals must follow a low-protein diet and early diagnosis improved prognosis.

The accumulation of propionyl-CoA results in significant mitochondrial CoA trapping and inhibited fatty acid oxidation. The enhanced anapleurosis of propionate and CoA trapping alters the pool sizes of tricarboxylic acid cycle (TCA) metabolites. This explains the marked hyperammonaemia that patients present with as well as potential hypoglycaemia

A high index of suspicion is required to diagnose inborn errors of metabolism (IEM). This case highlighted the importance of understanding key points in metabolic pathways. It also emphasized the correlation between catabolic stress being an initiating event in IEMs.