Irish Society of Inherited Metabolic Disorders

ANNUAL CONFERENCE

Gresham Hotel, Dublin

Friday 19th April 2024

Table of Contents

IRISH SOCIETY OF INHERITED METABOLIC DISORDERS (ISIMD)
Annual Conference
Friday, 19th April 2024
Gresham Hotel, Dublin

'Inherited Metabolic Disorders through the Life Cycle'

09.00-09.30 **Registration & welcome Coffee/Tea**

09.30-11.00 **Session 1 - Chair: Prof. Ina Knerr, Dublin / Dr. Siobhan O'Sullivan, Belfast**

09.30 -10.00 **'Classical Galactosaemia Medical and Developmental Outcomes in a Screened Paediatric Population in the Republic of Ireland: A Fifty-Year Retrospective Study'**
Dr. Doireann Pereira, Prof. Ina Knerr, NCIMD, Children's Health Ireland at Temple Street, Dublin

10.00-10.25 **'Newborn Metabolic Screening: Irish Perspectives in International Comparison'**
Dr. Mohamed Elsammak, Consultant Paediatric Chemical Pathologist, CHI & Rotunda Hospital, Dublin

10.25-11.00 **Keynote Lecture:**
'Newborn Metabolic Screening: Current Practice and Future Directions'
Prof. Gwendolyn Gramer, Head of Department for Inborn Metabolic Diseases, University Children's Hospital, Universitätsklinikum Hamburg-Eppendorf, Hamburg, Germany

11.00-11.30 **Coffee/Tea Break - Poster Displays - Industry Exhibition**

11:30 **Session 2 – Chair: Ms. Fiona Boyle / Prof. Ahmad A. Monavari**

11.30-12.00 **'A 25-Year Retrospective Review of Growth, Biochemical Control and Protein Intake from Birth to 4 Years in the Irish Phenylketonuria (PKU) Population'**
***Ms. Jenny McNulty**, Ms. Fiona Boyle, Clinical Specialist Metabolic Dietitians, NCIMD, Children's Health Ireland at Temple Street, Dublin*

12.00-13.00 **'Metabolic Case Reports'**
Ms. Fiona Boyle, Dublin; Dr. Kevin Gaughan, Dublin; Dr. Claire McGinn, Belfast. Ms Samantha Clarke, Belfast; Dr. Robert O'Byrne, Dublin

13.00-14.00 **Lunch - Poster Displays - Industry Exhibition**

14:00 **Session 3 - Chair: Ms. Maria O'Regan / Prof. James O'Byrne**

14.00-14.45 **'Metabolic Management of Pregnancies in Women with Inborn Metabolic Disorders (Fabry's, Organic Acidaemia, PKU, or Fatty Acid Oxidation Defect): Experience of the NCIMD in The Mater Hospital'**
Dr. Loai Shakerdi, Katie Moore, Alison Sheerin, Prof. James O'Byrne, NCIMD, Mater Misericordiae Hospital, Dublin

14.45-15.45 **'A National Metabolic Service from a Nursing Perspective – 30 Years dedicated Metabolic Nursing Service'.**
Nursing Team/Metabolic CNM's/CNS's (shared), NCIMD, CHI at Temple Street, Dublin

15.45 **'Save the Date' for the Annual Symposium of the Society for the Study of Inborn Errors of Metabolism (SSIEM) in Dublin in 2027**
Prof. Ina Knerr, Dublin

16.00 **Conference Close (followed by AGM for ISIMD Members, 16.00-16.30)**

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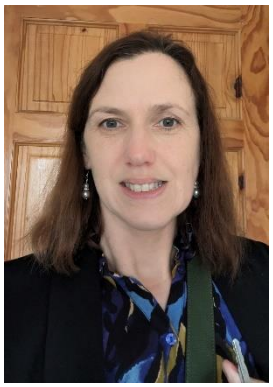
Guest Speaker Bios (Listed Alphabetically)



Fiona Boyle

Fiona is a Clinical Specialist Dietitian in Inherited Metabolic Disorders (IMD). She has worked in the National Centre for Inherited Metabolic Disorders, Temple Street, Dublin for 16 years. Her current research projects at present include looking at growth outcomes and Phe control in PKU (which my colleague Jenny is presenting today), growth outcomes in galactosaemia and determination of amino acid content of fruits and vegetables for use in IMD. She is also working as the lead author for a new paediatric nutrition reference guide for dietitians.

Samantha Clarke

Samantha has been a registered paediatric nurse for over 10 years now. She worked in Northern Ireland's regional paediatric intensive care unit for 8 years. During this time, she cared for a number of critically ill children who were found to have an inborn error of metabolism, and this is where she developed her interest in metabolics. She joined the regional metabolic service for Northern Ireland in the Royal Belfast Hospital for Sick Children 2 years ago as a paediatric metabolic specialist nurse.

Mohamed Elsammak

Mohamed graduated from Faculty of Medicine in Egypt 1989
He completed his MSc in Chemical Pathology and training in the University of Tor Vergata Rome in Italy from 1994-1997. He trained in the UK and graduated with his PhD in 2001 from Nottingham University, UK.

He received his Fellowship from Royal College of Pathologists (RCPath) UK in 2003.
Mohamed worked as a Consultant in UK in Brighton then went to Saudi Arabia as Consultant Chem Path and head of Chemical Pathology and Metabolic Division in King Fahad Specialist Hospital in Dammam Saudi Arabia.

He has several international publications in peer reviewed journals.

He is currently working as a Consultant Chem Path and Director of Blood Spot Newborn Screening Lab in Dublin

Dr Kevin Gaughan is a fourth year Paediatric Specialist Registrar (SpR) currently working at CHI Crumlin Hospital. He previously worked as an SpR at the National Centre for Inherited Metabolic Disorders (NCIMD) at Temple Street in Ireland.

Dr Gaughan obtained a B.A. with a degree in Biochemistry and Cell Biology at Trinity College Dublin. He subsequently went on to obtain a M.Sc. in Research and his medical degree from the Royal College of Surgeons Ireland (RCSI). Recently he was thrilled to join the Irish Society of Inherited Metabolic Disorders (ISIMD) as an associate committee member and looks forward to contributing to the field and working with those with a similar interest in Inherited Metabolic Disorders.

Prof. Gwendolyn Gramer

Prof Gwendolyn Gramer is a paediatrician specialized in inborn metabolic diseases and newborn screening. She holds a university professorship for paediatric metabolic medicine at the University of Hamburg and is head of the Department for Inherited Metabolic Disorders as well as medical head of the newborn screening and metabolic laboratory at the University Children's Hospital Hamburg-Eppendorf. Prof. Gramer studied medicine at the Universities of Würzburg, Vienna, and Heidelberg. She has been trained in paediatrics, peaediatric neurology, and paediatric metabolic medicine at the University Hospital Heidelberg. She completed an International Executive MBA in Health Care Management at the University of Salzburg Business School, Austria.

Her research focusses on the extension of the German newborn screening panel by additional metabolic disorders and vitamin B12 deficiency, and on outcome studies for patients with metabolic diseases detected by newborn screening. She was awarded the Dussault Medal of the International Society for Neonatal Screening for distinguished research contributions in newborn screening and received the Hufeland Award 2019 for significant research contributions in preventive medicine.

Claire McGinn

Dr Claire McGinn is a paediatric registrar in the Royal Belfast Hospital for Sick Children who is currently completing her PhD through Queen's University Belfast. Her research focuses on paediatric heart failure in children with congenital heart disease and cardiomyopathy.

Jenny McNulty is a Clinical Specialist Dietitian working in IMD for 15 years in the National Centre for Inherited Metabolic Disorders, Temple Street, Dublin.

Jenny has been involved in the roll out of BH4 therapy since it was approved for re-imbursement in Ireland in 2019. She has contributed to research including the international guidelines for the diagnosis and management of HCU, as well as a publication on the growth patterns of HCU patients.

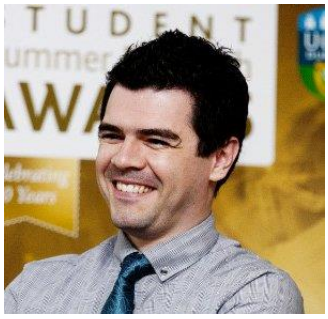
She also has publications in the areas of GA1, Galactosaemia and LCHADD. Her current research project is looking at the breast-feeding experiences of the mothers of children with PKU. Jenny is also working on the transition pathway for our young adults moving to the adult metabolic service in the Mater hospital.

Katie Moore

Katie completed her BSc in Dietetics at Ulster University in 2013 and subsequently worked as a dietitian in Sunderland Royal Hospital. Katie returned to Ulster in 2014 to commence her PhD studies at Ulster's Nutrition Innovation Centre for Food and Health. She completed her PhD in 2018, investigating the role of folate and the metabolically related B-vitamins in the ageing brain as part the Trinity, Ulster, Department of Agriculture Ageing (TUDA) study and lead the BrainHOP study, a 2-year randomised controlled trial. Katie's research was published in JAGS, JAMDA and Proc Nutr Soc and presented at conferences, including the International Congress of Nutrition (2017) and FASEB conference on Folic acid, B12 and One-carbon metabolism (2018). Katie returned to clinical dietetics in 2018 and joined the Inherited Metabolics Disorders dietetic team at the National Centre for adults at the Mater Misericordiae University Hospital Dublin in 2020. She currently works as senior dietitian as part of the MDT and her work includes providing dietetic support for those with inherited metabolics disorders who are planning a pregnancy, are pregnant and those postpartum.

Dr Doireann Pereira

Doireann is a clinical fellow in community paediatrics and neurodisability working in North Dublin disability services. She graduated from the Royal college of surgeons in 2015 and is currently completing a masters in paediatric palliative medicine with Cardiff university and a diploma in neurodisability with the British academy of childhood disability. During her time with the metabolic team in the NCIMD, Doireann was drawn to patients with galactosaemia due the robust screening and early intervention services available to this cohort and the complexity of their care. This led to audit, quality improvement, and research studies in galactosaemia and an ongoing collaboration between NCIMD and Emory University to identify genetic modifiers of outcomes in patients with galactosaemia. Outside of developmental and metabolic medicine, Doireann works on wellbeing initiatives for junior doctors and especially doctors who are parents, is a breastfeeding counsellor-in-training, and enjoys life at home with a giggling one year old.



Robert O'Byrne

Robert completed his undergraduate degree in biochemistry in Trinity College Dublin in 2007. He continued in Trinity's biochemistry department until 2013, principally researching enzyme localization and regulation in the protozoan parasite *Trypanosoma brucei,* and was awarded his PhD in 2013. Two years of postdoctoral research in the Royal College of Surgeons followed, and this was largely spent studying biomarkers of chemotherapeutic sensitivity and resistance in numerous cancer models. Robert then studied for his medical degree in University College Dublin, graduating in 2019, before completing his basic specialist training in general adult medicine. He is currently working as a registrar with the National Centre of Inherited Metabolic Disorders Adult Service in the Mater Hospital

Dr. Loai Shakerdi, MD, CES, MRCPI, MRES, PhD

Dr. Shakerdi graduated from the Faculty of Medicine in 1990. He completed basic specialist training, followed by higher specialist training in chemical pathology and endocrinology in 1997.

He was awarded an MSc in Biomedical Sciences from the University of Glasgow in 2000 and a PhD in biochemistry and molecular biology from the University of Glasgow in 2004.

He served on the editorial board of the Mediterranean Journal of Nutrition and Metabolism, the Official Journal of the Italian Association for Dietetics and Clinical Nutrition, 2010–2016.

He is currently an Associate Specialist in Adult Metabolics and Genetics at the National Centre for Inherited Metabolic Disorders at The Mater Misericordiae University Hospital.

Alison Sheerin

Alison completed her BSc in Nursing in Dublin City University and the Royal college of Surgeons through the Beaumont Hospital programme. She continued her studies in clinical research working in bench to bedside testing in industry before returning to clinical research nursing, where she was involved in the Minocycline, Parable, Homage, 5AZA and PATHway trials. Alison joined the Inherited Metabolics Disorders team at the National Centre for adults at the Mater Misericordiae University Hospital Dublin in 2018 as the Clinical Nurse Manager. She currently leads the team of clinical nurse specialists as part of the MDT which involves the national co-ordination of emergency care, maternal care, inpatient admissions, and outpatient clinics using multidisciplinary clinic management. Alison's research has been published in JIMD Reports and the Journal of American College Cardiology. Alison is the IMD educational liaison to Emergency Department and ward staff encompassing, nurses, doctors and other health and social care disciplines.

Display Poster Listing

Poster No	Lastname	Firstname	Abstract title
1	Cavallari	Sarah	CLINICAL CHARACTERISTICS AND METABOLIC PROFILES OF PAEDIATRIC PATIENTS WITH INBORN DISORDERS OF PURINE METABOLISM AT THE NATIONAL CENTRE FOR INHERITED METABOLIC DISORDERS
2	Elbishari	Zaineb	A CASE OF ORNITHINE TRANSCARBAMYLASE DEFICIENCY WITH TRANSIENT LOSS OF VISION
3	Fitzsimons	Patricia	A COMPLEX CASE OF RHABDOMYOLYSIS IN A TEENAGE BOY - THE LABORATORY PERSPECTIVE
4	Fitzsimons	Patricia	COBALAMIN G DEFECT IN TWO SIBLINGS: A RARE CAUSE OF MILD MACROCYTOSIS
5	Fitzsimons	Patricia	A CHALLENGING CASE OF ENCEPHALOPATHY DUE TO LATE ONSET OTC DEFICIENCY: THINK AMMONIA!
6	Fitzsimons	Patricia	INHERITED METABOLIC DISORDERS IN THREE CHILDREN PRESENTING WITH HYPERAMMONEMIA – THINK AMMONIA!
7	Shakerdi	Loai	Hyperammonemic encephalopathy post bariatric surgery – Think Ammonia

Poster No. 1

CLINICAL CHARACTERISTICS AND METABOLIC PROFILES OF PAEDIATRIC PATIENTS WITH INBORN DISORDERS OF PURINE METABOLISM AT THE NATIONAL CENTRE FOR INHERITED METABOLIC DISORDERS

Sarah Cavallari [1], Rema Buzeid[1], Fiona McElligott[2], Ina Knerr[1].
1 National Centre for Inherited Metabolic Disorders, CHI at Temple Street, Dublin
2 Paediatric Palliative Care, CHI at Temple Street, Dublin

Background: Inborn metabolic disorders involving purine catabolism can lead to a combination of metabolic and/or neuro-metabolic and multi-organ symptoms. Depending on the underlying defect, clinical symptoms may include hyperuricaemia, deposits in the urinary tract and other tissues, and neurodevelopmental symptoms. The more severe end of the clinical spectrum may include severe neurological symptoms and disease progression with complex needs. Treatment depends on the underlying condition and may include, e.g., medication, diet, and symptomatic and supportive treatment.
Aims: The aim of this retrospective study is to describe the phenotypes, clinical management and overall outcome of our cohort in the Irish health context.

Methods: This study utilises anonymised data compiled from experience with paediatric patients with rare purine disorders at the National Centre for Inherited Metabolic Disorders, Children's Health Ireland at Temple Street Hospital. Data pertaining to clinical phenotypes, treatment and clinical outcomes were reviewed.

Results: Review of our single-centre experience with paediatric patients with purine disorders along with their clinical presentations. Insights are provided into the treatment, management and the complex needs for a subgroup of severely affected patients along with potential areas for improving clinical care.

Conclusion: This retrospective analysis sheds light on the challenges and complexities associated with rare purine disorders, including HPRT deficiency, in paediatric patients. This study contributes to the understanding of these conditions and offers valuable insights for healthcare providers, underscoring the importance of ongoing research and in particular, collaboration in optimising care for individuals affected by rare purine disorders.

Poster No. 2

A CASE OF ORNITHINE TRANSCARBAMYLASE DEFICIENCY WITH TRANSIENT LOSS OF VISION

Elbishari, Z[1], Boruah, R[1], Sheikh, Y[2], Hartnett, C[3], O'Rourke, D[4], Lynch, B[4], Hughes J[1], Crushell E[1], Elsammak, M[1], Monavari, A[1]

1. National centre of Inherited Metabolic Disorders, Children's Health Ireland (CHI) at Temple Street, Dublin, Republic of Ireland.
2. Radiology Department, CHI at Temple Street, Dublin, Republic of Ireland.
3. Ophthalmology Department, CHI at Temple Street, Dublin, Republic of Ireland.
4. Neurology Department, CHI at Temple Street, Dublin, Republic of Ireland.

We present a girl diagnosed with Ornithine Transcarbamylase deficiency (OTCD) at eight years of age. She presented to emergency department (ED) with vomiting, abdominal pain, erratic behaviour, and confusion. She had slurred and senseless speech. She was noted to have low Glascow Coma Scale (GCS), she was responsive to pain. She was vitally stable, respiratory, cardiovascular, and gastrointestinal system exam were normal, but neurological exam showed four limb hypotonia, hyperreflexia and ankle clonus. She had baseline bloods including ammonia and serum amino acids. She was started on intravenous (IV) antibiotics and IV Aciclovir to cover for both encephalitis and meningitis. Her CT brain was normal. However, her ammonia was elevated at 324 umol/l and her serum amino acids showed marked elevation of glutamine, low citrulline, and low arginine which were suggestive of OTC deficiency. She was started on IV ammonia scavengers. She showed marked improvement clinically with normal GCS and ammonia decreased to 123umol/l after around 6 hours of treatment. Unfortunately, a week after admission she started complaining of headache, runny nose, temperature, photophobia, and bilateral visual loss. MRI brain and magnetic resonance venogram (MRV) showed slight restriction diffusion in occipital area. She had papilledema and high CSF opening pressure. She was started on acetazolamide and Co enzyme Q10. She responded well to management and made a good progress.

Poster No.3

A COMPLEX CASE OF RHABDOMYOLYSIS IN A TEENAGE BOY - THE LABORATORY PERSPECTIVE

Fitzsimons PE [1], Gorman K [2], Hegarty J [1], Knerr I [3], Monavari AA[3], Boruah R [3], Elsammak M [1]
[1]Metabolic Laboratory, Department of Paediatric Laboratory Medicine, Children's Health Ireland (CHI) at Temple Street (TS).
[2]Department of Paediatric Neurology, Children's Health Ireland at Temple Street
[3]National Centre for Inherited Metabolic Disorders at Children's Health Ireland at Temple Street

Case Presentation:

A 13-year-old boy was transferred to TS with a significant episode of rhabdomyolysis. On admission plasma CK was 32,080 U/L ref 58 – 312 with elevated transaminases, CRP and LDH. Renal profile was normal and no myoglobinuria present. He had a background history of fatigability, recent progressive muscle weakening, periodic pain, and cramps for about three months with significant progression of symptoms 4 weeks prior to admission. He was unable to sit unassisted or hold his head up.

Results:

Initial acylcarntine profile in dried blood spot showed reduced free carnitine, significantly increased C14:1, a primary marker for very long chain acyl Co A dehydrogenase deficiency (VLCADD) and increases in some but not all long-chain ratios. There were variable increases in C4 and C5 short chain acylcarnitines, no increase in hydroxybutyrylcarnitine and no increase in medium chain acylcarnitine species except for borderline increase in C10. CPTII ratio (C16 + C18:1/C2) was increased. Notable findings on a paired urine organic acid profile showed very marked increases in excretion of lactate and ketones with marked dicarboxylic acids and hydroxydicarboxylic acids reflecting lipolysis and ketogenic response to metabolic stress. There was a marked increase in excretion of glutarate, moderate increases in excretion of ethylmalonic acid, 2-hydroxyglutarate with increases in isobutyryl, isovaleryl, hexanoyl and suberyl glycine conjugates. Collectively, the profile was suggestive of Multiple acyl CoA dehydrogenase deficiency (MADD); however, it was difficult to completely reconcile with acylcarnitine profile. Treatment may have complicated findings which may also have been explained by loss of co-factors.

Conclusion:

Overall findings were possibly secondary to severe metabolic stress or MADD; however, VLCADD or CPTII deficiency could not be ruled out.

Assessing biochemical response to treatment (supplementation with carnitine, riboflavin, thiamine, biotin, other vitamins, and minerals) was recommended.

Molecular testing for ACADVL gene and MADD genes including genes involved in disorders of riboflavin metabolism were requested. Two pathogenic variants in *EFTDH* gene were identified confirming MADD. The patient is doing very well on treatment.

Poster No. 4

COBALAMIN G DEFECT IN TWO SIBLINGS: A RARE CAUSE OF MILD MACROCYTOSIS

Fitzsimons PE[1], De Buitléir C[1], Trench C[1], Cotter M[2], Ryan E[3], Monavari AA[4, 5, 6] and Elsammak M[1]
[1]Metabolic Laboratory, Department of Paediatric Laboratory Medicine, Children's Health Ireland (CHI) at Temple Street
[2]Haematology, Department of Paediatric Laboratory Medicine, Children's Health Ireland at Temple Street. [3]Department of Paediatrics, Children's Health Ireland at Temple Street.
[4]National Centre Inherited Metabolic Disorders, Children's Health Ireland at Temple Street.
[5] University College Dublin
[6] European Reference Network MetabERN

Case Presentation:

A two-year-old girl presented with hypoglycemia and a history of poor oral intake. Laboratory investigations were remarkable for positive Sars Cov-2 and mild neutropenia with marginally elevated MCV. Follow up FBC after discharge showed persistent increase in her MCV and delayed milestones (walking, speech, and communication skills) noted and metabolic work-up including total homocysteine was performed.

Results:

Urine organic acid analysis showed ketosis reflecting an appropriate response to hypoglycemia. Plasma amino acid profile identified low/normal methionine with a peak of free homocystine. Plasma total homocysteine was increased at 86µmol/L (reference 3-8). Newborn screening (NBS) results were retrospectively reviewed and confirmed low methionine at 5.8µmol/L. Repeat FBC film review showed macrocytosis. DBS acylcarntine profile was unremarkable.

Persistently elevated MCV with low methionine raised the possibility of a re-methylation defect due to intracellular cobalamin G/E. Defect in the MTHFR gene was less likely, as it commonly does not present with macrocytosis.

CSF profile was normal apart from undetectable CSF methionine. CSF MTHFR, total vitamin B12 and folate were normal. Molecular genetic analysis revealed two pathogenic variants in MTR gene confirming cblG. Her younger brother was biochemically screened pending genetic testing. Total homocysteine was elevated and plasma methionine low/normal. Methionine was low on retrospective review of his NBS. Genetic results revealed the same pathogenic variants in *MTR* gene.

Conclusion:

Methionine synthetic defects (CblG/E) and CblD-homocystinuria are rare causes of hyperhomocysteinemia syndromes not currently included in the newborn screening panel. Elevated MCV ± MMA in a child with developmental delay warrants exclusion of a cobalamin defect.

Poster No. 5

A CHALLENGING CASE OF ENCEPHALOPATHY DUE TO LATE ONSET OTC DEFICIENCY: THINK AMMONIA!

Fitzsimons PE[1], Donlon E[2], Shakerdi LA[3], Chaila E[2], Treacy EP [4,5]
[1] Departments of Paediatric Laboratory Medicine, Children's Health Ireland at Temple Street Dublin
[2] Department of Neurology University Hospital Limerick
[3] Adult Metabolic Unit, National Centre for Inherited Metabolic Disorders, Mater Misericordiae University Hospital
[4] School of Medicine, University College Dublin.
[5] Department of Medicine, Trinity College Dublin

Background:
Hyperammonaemic encephalopathy in adults is rare in the absence of liver disease; however, a delay in recognition is associated with a high mortality and risk of permanent neurological damage.

Case Presentation:
We describe a case of a previously healthy 27-year-old man who was admitted to hospital after been found at home confused, agitated, and talking incoherently. He represented 12 days later with acute focal seizures, progressing to encephalopathy. Brain MRI scans showed diffuse cerebral oedema. Plasma ammonia was measured at >2000 µmol/L. He developed refractory status epilepticus and subsequently died. Peri-mortem plasma amino acid profile showed mildly elevated glutamine and urine organic acid profile showed markedly elevated orotate. Genetic analysis identified a variant in the Ornithine transcarbamalyase (OTC) gene on the X chromosome.

Conclusion:
Late onset OTC deficiency is a rare but treatable cause of hyperammonaemic encephalopathy if identified early. Prompt consideration of ammonia measurement, appropriate investigations, and urgent management advice from a Metabolic team in a patient presenting any age with unexplained neurological and neuropsychiatric symptoms may prevent long-term complications and mortality.

Poster No. 6

INHERITED METABOLIC DISORDERS IN THREE CHILDREN PRESENTING WITH HYPERAMMONEMIA – THINK AMMONIA!

Fitzsimons PE[1], Elbishari Z[2], Shakerdi LA[3], Lynch B[4], O'Byrne JJ[3, 5] Hughes J[2] Monavari AA[2,5 ,6] Elsammak M[1]
[1]Departments of Paediatric Laboratory Medicine
[2]National Centre for Inherited Metabolic Disorders at Children's Health Ireland,
[3]National Centre for Inherited Metabolic Disorders at Mater Misericordiae University Hospital,
[4]Paediatric Neurology, Children's Health Ireland at Temple Street,
[5]School of Medicine, University College Dublin.
[6]MetabERN

Inherited metabolic disorders presenting with hyperammonaemia can present with behavioural changes, acute intermittent psychosis, encephalopathy or coma in children, adolescents, or adults. They may be challenging to recognise due to intermittent presentation and the opportunity to request ammonia may be missed, delayed, or not considered.

We present a case series where acute behavioural changes and/or abnormal LFTs led to ammonia request and appropriate metabolic investigations leading to diagnosis.

Case 1: 8-year-old girl with a history of vomiting, recurrent UTI and poor coordination presented with acute onset of confusion, erratic behaviour, and agitation. Initial biochemistry - transaminitis with negative toxicology screen. Plasma ammonia 324 umol/L (ref < 65).

Case 2: 14-year-old boy with a history of noctambulism presented with acute onset of confusion and erratic behaviour. Toxicology screen was negative. Initial biochemistry - mild transaminitis with negative toxicology screen CRP normal. Plasma ammonia 200 umol/L.

Case 3: 2-year-old girl presented with fractured forearm and otherwise clinically well. Routine biochemistry -significant transaminitis, AST 137 U/L (ref 0-50) and ALT 501 U/L (ref 0 - 45), deranged coagulation with prolonged PT and APTT. Ammonia 132 umol/L (ref <65).

In each case plasma amino acids showed increased glutamine with low/normal ornithine and arginine and urine organic acids showed elevated orotate, consistent with Ornithine Transcarbamylase (OTC) deficiency, a urea cycle defect.

These cases highlight the importance of appropriate requesting of ammonia in the setting of an acute psychiatric/neurological presentation or unexplained liver dysfunction in any age group. Hyperammonaemia is a time critical medical emergency requiring urgent management. Referral to a Metabolic team for appropriate investigations is essential to allow for timely intervention.

Poster No. 7

HYPERAMMONEMIC ENCEPHALOPATHY POST BARIATRIC SURGERY – THINK AMMONIA

Loai A Shakerdi[1], Patricia E Fitzsimons[2], Robert O'Byrne[1], Ahmad Ali[1], Alison Sheerin[1], Jessica Ivory[1], Kevin Jon Ilagan[1], Marianne Foley[1], Aine Durkan[2], Mohamed Elsammak[2] and James J O'Byrne[1]

[1] National Centre for Inherited Metabolic Diseases (NCIMD), Mater Misericordiae, University Hospital (MMUH), Dublin 7, D07 R2WY

[2] Department of Paediatric Laboratory Medicine, Metabolic Laboratory, Children's Health Ireland at Temple Street, D01 YC67

Background:

Hyperammonemic encephalopathy is a relatively recent reported complication post bariatric surgery. The mechanism is incompletely understood but hypotheses include genetic and non-genetic causes. Proposed mechanisms include: 1) reduction in the nutritive intake which may result in catabolism; 2) interference with citrulline synthesis in the intestine leading to depletion of urea cycle components and diminished ureagenic capacity; 3) potential formation of a blind gastric-small bowel pouch, which may alter the gut microbiome favoring growth of urealytic strains.

Methods:

We retrospectively reviewed patients referred to NCIMD at MMUH with development of hyperammonemic encephalopathy who had previously underwent bariatric surgery.

We present three cases of hyperammonemic encephalopathy, focusing on their clinical presentation, type of bariatric surgery, protein intake, investigations performed (plasma amino acids, urine organic acid and acylcarnitine analysis), treatment and clinical outcomes.

Results:

Patient 1: Female, age 43. Encephalopathy, portal hypertension and splenectomy. Ammonia 79-86 umol/L (18.0-72.0).

Patient 2: Female, age 46. Hypothyroidism, vitiligo, vomiting, fatigue, leg, and abdominal swelling. Ammonia 213 umol/L

Patient 3: Female, age 60. Proximal myopathy, hepatic steatosis. Ammonia 175-246 umol/L.

Conclusion:

Hyperammonemic encephalopathy represents a serious, under recognized, and potentially treatable complication post bariatric surgery. Confounding factors e.g., bariatric surgery, protein intake and medication may affect outcome. An inherited cause must be considered and outruled. The main management objective is to establish underlying trigger while aiming to reduce ammonia levels by providing adequate nutritional support during increased metabolic demand. Recognition of hyperammonemia, prompt measurement of ammonia and advice from specialist team to guide appropriate investigations and management will improve outcomes and reduce neurological sequelae.

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