A rare metabolic case presenting to Ophthalmology

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Introduction

Homocysteinuria is rare autosomal recessive disorder of methionine metabolism involving the transsulfuration or methylation pathway in methionine metabolism

- **Incidence**: 1 in 250,000
- **Deficiencies of 3 enzymes namely** methylene tetrahydrofolate reductase, methycobalamin synthase and cystathionin B-synthase lead to the accumulation of homocysteine and its metabolites
- **Clinical features**: marfanoid habitus, downward lens dislocation, myopia, seizures, flush on checks
- **Main complication**: thromboembolism, others include osteoporosis and short sightedness
- **Treatment**: low protein diet, Pyridoxine (vitamin B6), Betaine Vitamin B12 and risk management for thromboembolism

Case Report

- 25 years old female presented with rapid onset of loss of vision on both eyes
- **Background history**: well-controlled epilepsy, normal mental and physical development
- **Family history**: nothing of significant; no History of Marfan’s Syndrome
- **Examination**: systemic review was unremarkable, clinically eu-thyroid and eu-adrenal. She had high arched palate with no other stigmata of Marfan’s Syndrome
- **Occul examination**: Inferior lens dislocation in both eyes

Investigations

<table>
<thead>
<tr>
<th>Laboratory Investigation</th>
<th>Imaging</th>
<th>Genetic Test results</th>
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</thead>
<tbody>
<tr>
<td>Routine Haematology – normal</td>
<td>CT angiogram - normal aortic root dimension</td>
<td>Heterozygous pathogenic mutation on the Cystathionin B synthase (CBS) gene c.833T&gt;C; p1278T.</td>
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<tr>
<td>Routine Biochemistry – normal</td>
<td>Echo – normal</td>
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<tr>
<td>Urine homocysteine = 524.5umol/L (2-14.2)</td>
<td>ECG - normal</td>
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<tr>
<td>Plasma homocysteine = 237.9 &amp; 254.5 umol/L(0-16)</td>
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Management

- Low protein diet
- Pyridoxine 100mg TDS (titrate to response)
- Folic acid supplementation
- Vitamin B12
- Referral to Ophthalmology for: Vitrectomy, lensectomy and right intra-ocular lens implant
- Consider Betaine: promotes conversion of homocysteine back to methionine

Discussion

- Although visual disturbances have been described as a complication in thyroid eye disease, it can present in other metabolic conditions
- The risk of thromboembolism is increased in Homocysteinuria; therefore prompt diagnosis and treatment is essential especially in younger patients <30 years
- Female patient should be counselled for the increase risk of thromboembolism with pregnancy
- Rare metabolic conditions should be considered in patients with visual problems