Hypertrophic cardiomyopathy related to a mutation in ACAD9 gene: in the border between fatty acid oxidation defect and complex I deficiency

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Hypertrophic cardiomyopathy related to mutation in ACAD9 gene. Ben chehida et al, Tunisia

AIM

• Hypertrophic cardiomyopathy (HCM) may be indicative of energy defect.
• Metabolic investigations are mandatory but not always conclusive, nor cost-effective.
• Advances of genetic investigations are more useful.

THE CASE

• We report a case of a 19-months-old infant,
• Born from first degree cousins,
• Uneventful familial history
• He presented with recurrent syncope (age of onset: 8 months).
Clinical examination:
• Normal growth
• Heart failure
• Hypotonia
• Psychomotor retardation.

Echocardiography:
• Non obstructive mixed HCM,
• Moderate LV systolic dysfunction (LV fraction of ejection =45%)

Rhythmic Holter.
• Features of LV hypertrophy (Sokolow=45mm); PR=0,82s
• No conduction or excitability disorders on the
Laboratory investigations

- Acidosis (pH=7,41; HCO3-=13)
- LFTs, CK, Blood count and tubular function tests: normal
- Lactates =9,28 mmol/l

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<thead>
<tr>
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<th>Pre-prandial</th>
<th>Post-prandial</th>
<th>Pre-prandial</th>
<th>Post-prandial</th>
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</thead>
<tbody>
<tr>
<td>Lactate (L)</td>
<td>4,36 (1,05-1,76)</td>
<td>9,27 (1,4-2,09)</td>
<td>12,15 (1,05-1,76)</td>
<td>11,57 (1,4-2,09)</td>
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<td>(mmol/l)</td>
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<tr>
<td>Pyruvate (P)</td>
<td>0,28 (0,08-0,15)</td>
<td>0,51 (0,12-0,17)</td>
<td>0,54 (0,08-0,15)</td>
<td>0,5 (0,12-0,17)</td>
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<td>(mmol/l)</td>
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<tr>
<td>L/P ratio</td>
<td>15,09 (9,9-18)</td>
<td>17,97 (10,9-14,4)</td>
<td>22,38 (9,9-18)</td>
<td>22,99 (10,9-14,4)</td>
</tr>
</tbody>
</table>
THE CASE

WES ➔ a variant in the ACAD9 gene (c.1204G>T), probably pathogenic, at a homozygous state in the patient and heterozygous state in the parents.

CONCLUSION

Cardiomyopathy in this case revealed ACAD9 gene mutations. This is a rare defect of both mitochondrial fatty acid oxidation and respiratory chain (defect of complex I assembly).

Regular monitoring of cardiac, neurological and liver involvement is warranted.

Genetic counseling should take in account the poor prognosis.