Children and adolescents with severe TBI can develop late pituitary dysfunction independently of the results of the first pituitary evaluation


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Background:
- Traumatic brain injury (TBI) is common in childhood
- Little is known about mid term and long term endocrine outcome
- We have previously demonstrated that pituitary dysfunction is not rare one year after severe TBI

Aim of the study:
- To determine in a prospective way if patients with a personal history of severe TBI (GCS < or = 8) during childhood may develop long term pituitary dysfunction independently of the results of early hormonal investigations

Method and patients:
- Prospective follow up of an initial cohort of subjects (N=87) with a personal history of severe TBI
- 38/87 patients currently included
- 30 boys/8 girls
- 35 accidental TBI, 3 inflicted TBI
- Mean age at TBI: 6.7y [0.8-15.2]
- 73 were accidental TBI, 14 inflicted TBI (shaken baby syndrome)
- Clinical and hormonal evaluation (basal and dynamic) one year after TBI
- Clinical and hormonal evaluation (basal) at last visit
- Growth hormone deficiency requiring substitution was defined by decreased growth velocity under -2 SD, low IGF1 under -2 SD, 2 stimulated GH peak under 7ng/ml

Results:
- Mean age: 13.3 yr [5.3-21.8]
- Mean duration after TBI: 6.4 years [4.6-8]
- 29 had normal BMI, 4 overweight, 5 obese
- One year after TBI, 20 patients had normal pituitary function (group 1), 18 patients had growth hormone dysfunction (2 stimulated GH peak under 7ng/ml)

<table>
<thead>
<tr>
<th>Group 1</th>
<th>Group 2</th>
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<tbody>
<tr>
<td>N=20</td>
<td>N=18</td>
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<tr>
<td>13.1 yr [6.9-21.8]</td>
<td>13 yr [5.3-20.2]</td>
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<tr>
<td>6 yr after TBI [5.4-6.7]</td>
<td>5.6 yr after TBI [3.9-7.1]</td>
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- Central precocious puberty
  - N=1
  - Girl aged 7.8 yr
  - 6.3 yr after TBI
  - B2P1
  - N=1
  - Boy aged 10 yr
  - 6.9 yr after TBI
  - G2P1

- Growth hormone deficiency requiring substitution
  - N=1
  - Boy aged 10 yr
  - 5.6 yr after TBI
  - N=2
  - 1 Girl aged 11.9 yr, 4.6 yr after TBI, B3P3 Tanner stage, obese
  - 1 Boy aged 12.3 yr, 6.4 yr after TBI, G2P1 Tanner stage

- Normal evaluation
  - N=18
  - N=15

Conclusion:
- Patients may develop clinical expression of pituitary dysfunction long term after severe TBI even if first explorations were normal
- Long term and regular follow up is needed in patients with history of severe TBI