Growth Hormone Deficiency after Traumatic Brain Injury: improvements in quality of life with GH therapy - analysis of the KIMS database

SUPPLEMENTARY ANALYSIS

In addition to the main manuscript supplementary data regarding secular trends in KIMS registrations are presented here.

*Analysis 1*: All patients with TBI for the assessment of trends in the registrations of PTHP (Group 1, n=479).

**Methodology**: In the first analysis, in order to ascertain whether the number of KIMS patients with TBI were increasing, the database was interrogated for all registrations from inception in 1994 to 2009. In order to ascertain relative proportions, this number was expressed as percentage of the total number of registrations. Additionally, in patients with an injury date/onset of pituitary disease, the age at onset was compared to age at diagnosis of GHD to ascertain the lag time from injury to diagnosis in both TBI and NFPA (Group 1).

**Results**: KIMS registrations: The proportion of registrations due to TBI increased over time, with the highest proportion being recorded between 2005 and 2009 (5.39% of the registered patients) (Table S1).

Time from injury to GHD diagnosis: Based on all available reports, injury date was recorded in 141 TBI patients. Mean age of injury was 25.9 (SD 13.8) years. 10 patients were below the age of 19 years when the injury occurred. There was a trend for a longer lag time between injury date (TBI) or diagnosis of pituitary disease (NFPA) and GHD diagnosis in more recent years when compared to earlier years. In order to understand the significant factors implicated in the delay between diagnosis (onset of pituitary disease in KIMS)/injury date and diagnosis of GHD, a regression analysis was undertaken with years between injury diagnosis/injury and date of GHD diagnosis as the dependant variable, and diagnosis group,
age at GHD diagnosis, gender, calendar-year of GHD diagnosis as explanatory variables. The
time between pituitary disease onset and GHD diagnosis was 4.6 years in NFPA patients vs.
7.0 years for TBI patients (as estimated at calendar-year 2000 and males age 45 at diagnosis).
Thus TBI patients were generally diagnosed with GHD on average 2.4 years later (95% CI: 
1.36 to 3.55 years; p<=0.0001) than NFPA patients. Females were diagnosed 0.45 years later 
than males (95% CI: 0.03 to 0.88; p=0.035) and time increased on average by 0.14 years by 
each calendar year (95% CI: 0.11 to 0.18; p<0.0001). Time to diagnosis decreased by 0.19 
year per increased year of age (95% CI: -0.20 to -0.17; p<0.0001).

Table S1:

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<tbody>
<tr>
<td>Total no registrations for TBI</td>
<td>15</td>
<td>24</td>
<td>24</td>
<td>68</td>
<td>190</td>
<td>138</td>
<td>19</td>
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<td>% of all registrations per interval</td>
<td>2.16</td>
<td>1.58</td>
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<td>Total no registrations for NFPA</td>
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<td>% of all registrations per interval</td>
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<td>29.87</td>
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Table S1 Registrations on KIMS database attributed to traumatic brain injury up until 2012.