Acute effects of a training session on IGF-I and IGFBP-3 concentrations in Brazilian Jiu-Jitsu fighters

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Background

- The relationship between sports intensity and growth has become a concern in teenagers.
- Exercise is closely related to anabolic functions caused by the action of the GH/IGF-I axis,
- Changes in the GH/IGF-I axis have been studied as biomarkers for training intensity in adolescents;
- However, reports on the effects of physical effort on GH and IGF-I levels are discordant and studies on GH and IGF-I responses in combat sports are scarce.

Aim

This prompted us to investigate the effects of Brazilian Jiu-Jitsu training session on the IGF-I and IGFBP-3 concentrations

Subjects and Methods

A convenience sample of 9 male Jiu-Jitsu fighters, representing a sample of the National Elite in the sport in Brazil with 5.4 ± 2.7 yr of practice and regular training frequency were non-randomly selected and studied.

Table 1 – Clinical characterization of the 9 Jiu-Jitsu fighters. Data are expressed as mean ± SD.

<table>
<thead>
<tr>
<th>Variables</th>
<th>n = 9</th>
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<tr>
<td>Age (years)</td>
<td>25 ± 4.7</td>
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<tr>
<td>Weight (kg)</td>
<td>71.3 ± 8.0</td>
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<tr>
<td>Height (cm)</td>
<td>176.0 ± 5.0</td>
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<tr>
<td>Practice Experience (years)</td>
<td>5.4 ± 2.7</td>
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Study Design

Non-fast blood samples for serum IGF-I and IGFBP-3 determinations (Immulite 2000, Siemens) were collected from the subjects:

- before the training session, preceded by 30 minutes of rest,
- immediately after the training session.

The training session used in this study was composed by:

- a warm up (20 minutes of stretching exercises);
- a main part divided between:
  - the improvement of techniques (20min) and then
  - a sequence of six Brazilian Jiu-Jitsu fights, with a duration of 7.5 minutes per fight. Totaling 45 minutes of effort.
  - at the end of the training: stretching exercises.

The fighters’ perception of the intensity of the effort was recorded using Borg scale for perceived exertion (BORG, 1982).

Data was analyzed by Wilcoxon test at 5% significance (P<0.05).

Results

The athletes reported the training intensity between 15 to 17 in PSE: Hard and Very Hard

No significant difference was observed on IGF-I (P=0.57) or IGFBP-3 (P=0.73) levels before or after the training session.

Figure 1- IGF-I (ng/ml) and IGFBP-3 (ug/ml) serum concentration before and after a Brazilian Jiu-Jitsu training session. n = 9. (P=0.57 and P=0.73, respectively).

Seven athletes had IGF-I levels below the 25th centile (P25).

In 2 of them IGF-I were < P10

IGFBP-3 levels were lower than 4 mg/L in 6 athletes.

Discussion

- Differently to previous studies, which reported reductions in IGF-I in wrestling fighters after training, a hard training session by National Elite Brazilian Jiu-Jitsu fighters did not have a significant effect on IGF-I or IGFBP-3 concentrations.

- This was probably due to the training status of the fighters, who were at their maximum level of performance in the season and/or to their already low levels of IGF-I and IGFBP-3 before training session.

Conclusion

Our findings support the use of acute changes in GH/IGF-I as biomarkers for training status in combat sports.