



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

Hugo Tourinho Filho<sup>1</sup>, E.F. Puggina<sup>1</sup>, C. Moraes<sup>1</sup>, L.P. Oliveira<sup>1</sup>, Carlos E. Martinelli Jr<sup>2</sup>



Department of Paediatrics  
FMRP-USP

School of Physical Education and Sports of Ribeirão Preto – USP and Department of Paediatrics<sup>2</sup>, Ribeirão Preto Medical School (FMRP), University of São Paulo (USP), Ribeirão Preto, Brazil

## 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.

Variables	n = 9
Age (years)	25 ± 4.7
Weight (kg)	71.3 ± 8.0
Height (cm)	176.0 ± 5.0
Practice Experience (years)	5.4 ± 2.7

## 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.

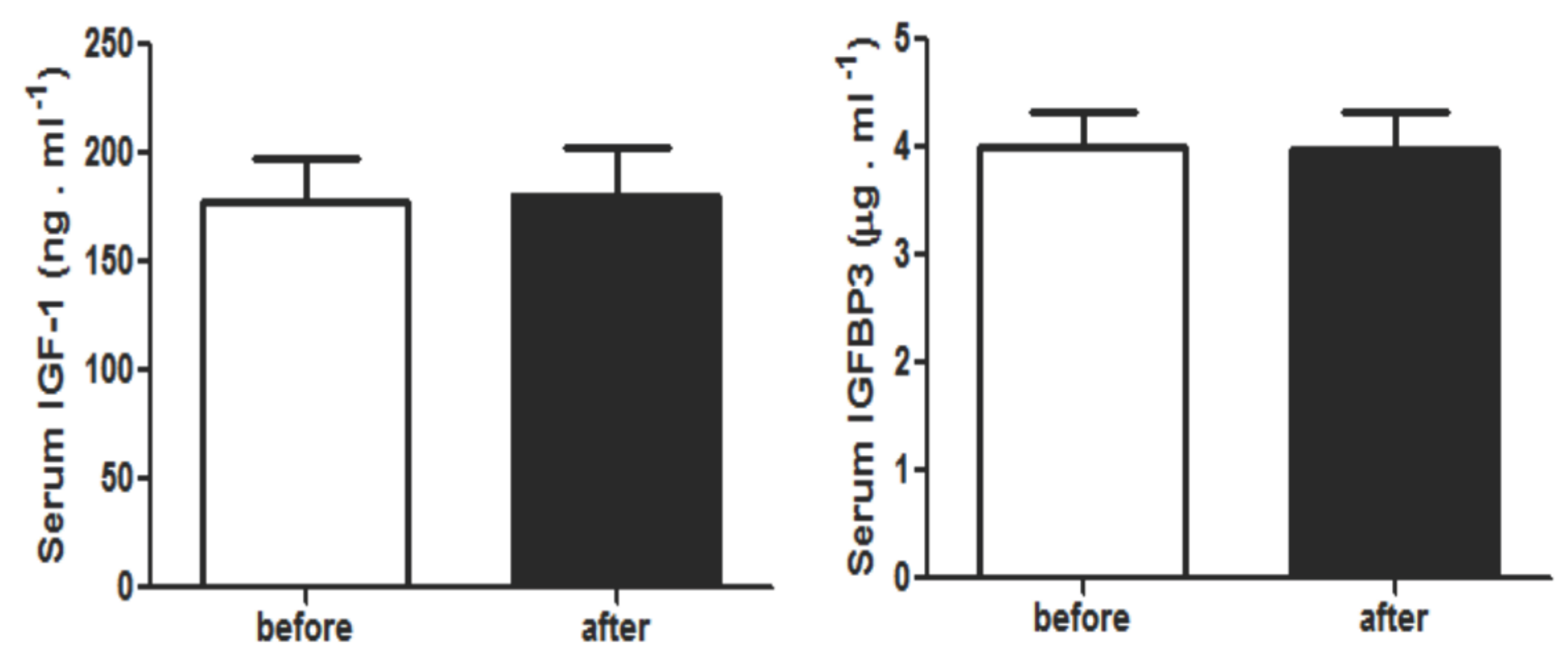
The fighters' perception of the intensity of the effort was recorded using Borg scale for perceived exertion (BORG, 1982).

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 25<sup>th</sup> 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.