



SUMMARY AND CONCLUSION

Under extreme exercise conditions increased IGFBP-3 proteolysis can not fully compensate the effects of decreased t-IGF-I and increased IGFBP-1 on circulating IGF-I bioavailability.

INTRODUCTION

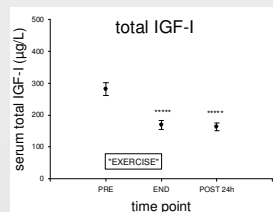
Ultra-endurance exercise during 6 days is related to negative energy balance. The effects on the circulatory components of the IGF-IGFBP system were investigated.

DESIGN

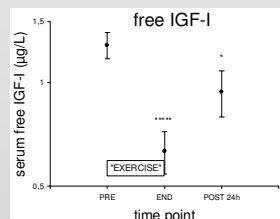
Subjects: 10 men and 8 women (32 ± 1 years, BMI 24 [20-26] kg · m⁻² performed ultra-endurance exercise (mainly running, kayaking, biking, climbing). Median duration of the race was 6.3 (range 5.2 -7.3) days. Blood samples were drawn before (PRE; n=18), at the end of (END; n =18) and 24 hours after (POST24h; n=12) the race. Food and drink intake was ad libitum.

RESULTS

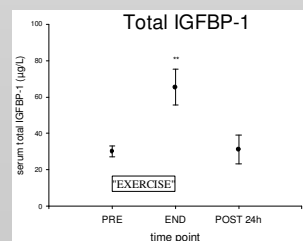
Median energy expenditure (*method modified from Weir et al 1949*) was 77047 (range 64235-113845) kcal during the race (n = 6). Body weight decreased by 1 ± 1 %. Energy intake was registered in 3 men and covered 75, 85 and 87 % of the energy expenditure during the race.



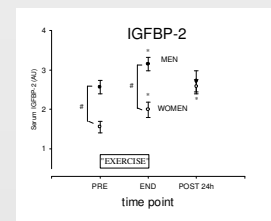
Total IGF-I (RIA) decreased by 44 (62-97) % during the race and remained decreased at POST 24h. The decrease in t-IGF-I was most marked in subjects with the largest energy deficit (n = 3 available).



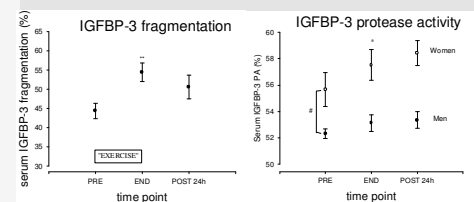
Free IGF-I (DSL ELISA) decreased by 50 ± 5 % during the race and remained decreased at POST 24 h. Free IGF-I was 0.4 (0.1-1.0) % of total IGF-I at PRE and did not change significantly.



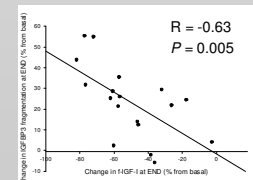
IGFBP-1 (DSL ELISA) increased by 127 ± 36 % during the race and had returned back to basal levels at POST 24h. At PRE, IGFBP-1 correlated negatively with f-IGF-I. No correlation was found at END or post 24h.



IGFBP-2 (W/B) increased by 29 ± 9 % during the race. In women, IGFBP-2 levels remained elevated at POST 24h.



Serum IGFBP-3 fragmentation (WLB) increased by 23 ± 4 % during exercise. **Serum IGFBP-3 protease activity (protease assay)** increased significantly only in women.



There was a correlation between the increase in serum IGFBP-3 fragmentation and the decrease in f-IGF-I during the race.