

# HYDRATION CHARACTERISTICS OF MALE ELITE CLIMBERS



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## Introduction

Significant scientific documents describe the deleterious effects of reduced total body water (TBW) on endurance performance. However, the influence of hydration on muscular strength, power and high-intensity endurance, and hypohydration might directly affect some component of the neuromuscular system (Judelson, 2007)

## Objective

The aim of this study was to show the differences in hydration status between two levels of performance in elite climbers

## Material and Methods

Thirteen male elite climbers, who had participated in the 2004 World Cup of International Federation of Sport Climbing (IFSC), completed a fasting body composition assessment.

- BIA was performed with recommended international procedures (Lukaski, 1987)
- TBW was estimated by whole-body multifrequency bioelectrical impedance analysis (BIA) (MediSystem, Sanocare Human System, Madrid, Spain)
- Fat percentage was calculated by BIA Segal's equation (Segal, 1987)
- The ranking of IFSC was used to classify the performance. Seven climbers were ranked within the top 30 (<30) and six > 30.
- A non parametric Mann-Whitney test was carried out to analyze differences between groups. Significant level was set at  $P < 0.05$
- Product moment correlation coefficients were performed between total body water as independent variable and ranking as dependent variable
- Partial correlations between IFSC ranking and hydration variables were performed and adjusted according to fat percentage.

## References

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- Segal KR, Van Loan M, Fitzgerald PI, Hodgdon JA, Van Itallie TB. Lean body mass estimation by bioelectrical impedance analysis: a four-site cross-validation study. *Am J Clin Nutr.* 1988;47(1):7-14.
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## Results

No differences were found in height, weight and age between groups ( $P > 0.05$ ) TBW was greater in climbers who classified within the first 30 compared for climbers who took positions after 30. ( $P < 0.01$ ) (Table 1)

Table 1: Anthropometric and body composition characteristics between groups

Variables	Ranking IFSC			P
	< 30	> 30		
Weight	kg 62.5 ± 6.88	62.8 ± 5.12	0.88	
Height	cm 175 ± 8.89	172.8 ± 3.12	0.47	
Age	years 24.9 ± 3.63	25.33 ± 5.12	0.94	
Fat BIA	% 9.77 ± 3.93	13.7 ± 3.20	0.02	
TBW	% 66.1 ± 9.89	61.9 ± 3.59	0.01	

Also a relationship between individual ranking and hydration status was found. (Figure 1) but a partial correlation coefficients adjusted by percent fat ( $r = -0.37$ ;  $P < 0.11$ ) show a non significant relationship.

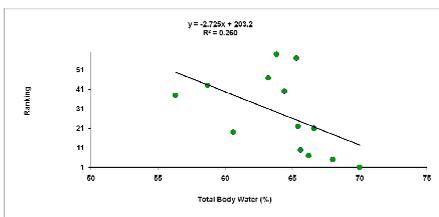


Figure 1: Relationship between Total Body Water and IFSC Ranking 2004

## Discussion

The relative requirements of rock climbing are technical, physical and mental factors (Magiera, 2013)

Dehydration appears to consistently attenuate strength (by approximately 2%), power (by approximately 3%) and high-intensity endurance (by approximately 10%), suggesting alterations in total body water affect some aspect of force generation (Judelson, 2007)

Nevertheless the associations of TBW and FFM must be considered for a better profile of adiposity.

It has been speculated that high levels of FFM hydration must be related with performance