



## Basic Body Dimensions of Tennis Players - Optimisation Process

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### Introduction

Body height and weight can be conceived of as very significant factors of the tennis player's performance. Body dimensions influence positively or negatively a whole range of components of tennis play (sprint start, velocity, skillfulness, range of movement, service, etc.) (Vaverka et al, 2005). Contradictory influences of body dimensions on the set of tennis elements induce questions about their optimum dimensions and trends of their development in top world-class tennis. The solution to this question can be provided by the analysis of the model of top-level world-class tennis players.

### Methods

Initial data concerning body height, weight and ranking (internet information) and calculated weight-height indexes were analysed from participants, men and women, in the 2001 US Open and the 2004 and 2005 Australia Opens (n = 90-120 in each tournament). Statistical analysis (Statistica 6, analysis of variance, normality of data distribution, correlation analysis) was focused on the comparison of different selective sets and different performance levels of groups of players, the relationship of observed variables to the performance level of players, and comparison of tennis players with the general population.

### Results and Discussion

Results have shown the stabilisation of the body dimensions within a three year period for the male data analysed and the indication of the non-finishing of the development of body dimensions for the female data set analysed. The basic statistical characteristics (Mean  $\pm$  S.D.) of the male data analysed; body height  $1.85 \pm 0.07$  m, body weight  $78.11 \pm 7.04$  kg, and female; body height  $1.71 \pm 0.06$  m, body weight  $59.77 \pm 5.50$  kg. The findings of body dimensions represent the model of the optimum range of the observed variables for top level world-class players within the period analysed. No-differences have been found in the body dimensions among different performance groups of players and no statistical dependence has been confirmed between the ranking of players and the observed body dimensions.

### Conclusion

The defined range of the basic body dimensions of top world-class players (Mean  $\pm$  S.D.) can be considered to be optimal for top-level performance in tennis. In principle, these data represent the range of the body dimensions in which the interaction of positive and negative influences related to different elements of tennis play is optimal. Deviations in the height and weight of players from the found range comprise a specific model of players with a considerable advantage in some areas of tennis elements and, on the other hand, a negative influence in other spheres. It is necessary to adapt the conception and strategy of the play and training by these individuals with regard to their somatic predisposition. The results of this research can be utilised as one of the criteria for the selection of young players for top-level training.

### References

Vaverka, F., Cernosek, M., Tesarova, K., & Elfmark, M. (in press). The influence of body height on the serve in tennis. In Proceedings of the XXIII International Symposium on Biomechanics in Sports. Beijing.