Changes in field test performances throughout a yearlong training / competition cycle of young, highly-trained Arab table tennis players

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Abstract: the purpose of this study was to examine changes in field test performances throughout a yearlong training / competition cycle. Six highly-trained male Arab table tennis players (13.1 ± 1.1 years) were field tested four times during the course of a year to assess changes in speed, explosive strength and aerobic fitness. Statistical analysis showed that after a year players were likely or very likely (Cohen's Effect Size 0.45-0.71) to have improved these physical qualities independent of body dimension. However, improvement between adjacent tests may be unclear due to training focus, frequent travel and cultural breaks from training.

Keywords: table tennis, field testing.

1. INTRODUCTION

Table tennis requires speed, explosive strength and a strong aerobic base [1]. These qualities can be monitored throughout a yearlong cycle by field testing.

2. METHODOLOGY

Six male players (13.1 ± 1.1 years) training or competing in the National junior squad for approximately 13 hours per week participated in this study. From each field test session [Sep-11 (start of yearlong cycle), Dec-11 (post-training phase), May-12 (mid competition phase) and Sep-12 (post-competition, Ramadan and summer break)] the best performance from two 5-m sprints, three counter-movement jumps (CMJ's) and one test to estimate maximum aerobic speed (MAS) was taken. Between-session (paired) standardized differences (Cohen's effect size, ES) [2] were calculated. To account for any growth related effect on performance, all between-test comparisons were adjusted for changes in body mass. The changes were then assessed qualitatively (e.g. unclear, likely [2]) using the estimated smallest worthwhile change and the 90% confidence interval associated with each ES.

3. RESULTS

Table 1. 5-m sprint time, CMJ height and MAS (mean ± SD) for 6 highly-trained male Arab table tennis players field tested four times throughout a yearlong training / competition cycle.

	SPEED - 5 m sprint time (s)				EXPLOSIVE STRENGTH - CMJ (cm)				AEROBIC FITNESS - MAS (km/h)			
	Sep-11	Dec-11	May-12	Sep-12	Sep-11	Dec-11	May-12	Sep-12	Sep-11	Dec-11	May-12	Sep-12
Mean ± SD	1.18 ± 0.12	1.16 ± 0.09	1.15 ± 0.08	1.12 ± 0.09	27.27 ± 6.06	30.65 ± 8.61	31.35 ± 7.29	32.38 ± 8.18	13.17 ± 1.56	13.40 ± 1.52	14.11 ± 1.78	14.08 ± 1.33
ES differences												
Sep-11		-0.19 unclear	-0.25 unclear	-0.45 likely		0.47 likely	0.57 very likely	0.71 very likely		0.12 unclear	0.50 likely	0.49 likely
Dec-11			-0.08 unclear	-0.33 unclear			0.07 unclear	0.17 unclear			0.15 unclear	0.36 unclear
May-12				-0.31 unclear				0.12 unclear				-0.01 unclear
Body mass (kg)	51.5 ± 12.1	54.9 ± 11.5	56.0 ± 10.9	59.8 ± 10.7								

4. DISCUSSION

From Sep-11 to Dec-11 there was only likely to be an improvement in explosive strength shown by CMJ height increasing by over 3 cm on average. CMJ performance may have improved due to enhanced jumping technique as initial training sessions with the physical coach focused on developing movement competence and motor control.

From Dec-11 to May-12 improvements in speed, explosive strength and aerobic fitness are unclear (ES 0.07-0.15) and may have been hampered by a focus on the technical and tactical components of competition as opposed to physical development. A structured strength and conditioning program was difficult to implement due to frequent worldwide travel which presents a unique set of challenges in itself such as ensuring optimal sleep and nutrition for physical development.

Very likely (ES 0.57) and likely (ES 0.50) improvements in explosive strength and aerobic fitness respectively occurred from Sep-11 to May-12. This may be due to the accumulative effect of physical conditioning work completed in the gym and at the table through training and competition since the start of the year. Linear speed has not been developed clearly in this time period perhaps due to table tennis requiring

more lateral (side-step) technique. Future work can help determine which field tests are most applicable for monitoring table tennis-specific fitness.

The lack of progression from May-12 to Sep-12 in all physical qualities could be attributed to a period of de-training over the summer holiday break and Ramadan. For the future, more detailed anthropometric profiling would be needed to determine how body composition (probable higher percentage of fat mass) changed in this period. Also it would be prudent to see if the players' were adversely affected by sudden increased rates of growth (height, limb length) which could potentially impair motor control [3].

5. CONCLUSION

Over the course of a year, these young table tennis players have likely developed their speed, explosive strength and aerobic fitness, independently of changes in body dimension. Maintaining physical fitness around the period of Ramadan presents a unique challenge to Arab athletes. Additional, targeted conditioning work around this period should enable young, highly-trained Arab table tennis players to start the next yearlong cycle in improved physical condition. Further work is needed to better understand how this cohort of male players develops so that physical training can be optimized accordingly to enhance table tennis performance.

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