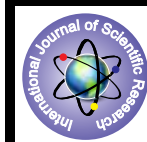


The Effect of Plymetrich Training on the Competitive Swimming Bloch Start



Physical Education

KEYWORDS:

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INTRODUCTION:

There have been many starting styles used in past years. The circular backswing method has now been replaced by the grab start. Shins Groppe (1984) reported that in the early 1970's the conventional arm swing start lost its popularity to the grab start. The grab start technique is performed by gripping the front edge of the starting block with the hands while in the set position. Hanauer introduced this start in the late 1960's and although there has been some dispute, over which starting technique is most effective, the grab start is and widely used method of starting at all levels of competition. Plyometrics were developed in the mid 1960's as a training method to relate muscular strength and power (Adams 1985). Although researches articles define "plyometrics" somewhat differently, Despains and Cheverly (1987) point out that most agree the term refers to exercises that are characterized by powerful muscular contractions in response to rapid, dynamic loading or stretching of the involved muscles. This loading or stretching of the involved muscles is an advantage is that plyometrics are also performed at higher velocities than traditional weight training methods, increasing their specificity to competitive performance (Young 1991).

STATEMENT OF THE PROBLEM:

Due to the explosive nature of the swimming block start and the movement pattern requiring the leg extensor muscle to product fast and forceful contractions, plyometric training could be seen as a means of developing the performance of this skill.

The determination of the practical use of plyometric exercises, and their effect on a skill such as the swimming block start, could be profoundly invaluable for swimming coaches and trainers. Plyometric exercises may be incorporated justifiably, into dry-land strength and conditioning programs for swimmers in the attempt to improve starting ability and performance. Plyometrics could also then be foreseen as a possible means of improving swimming turn ability and performance.

METHODOLOGY:

Fourteen male subjects between the ages of 15 to 25 years, with at least six years of competitive swimming experience, volunteered to participate in the study. Importantly, the subjects were competent and well practiced in the swimming "grab" start technique. In other words, be able to demonstrated consistent performance in a standard two-foot starting technique. Subjects were split into two groups, an experimental group performing plyometric training (PG) and a control group (C) who continued their normal training patterns. Plyometric training was conducted 3 times weekly over a 6- week period. The type of training was low to moderate intensity, to reduce the risk of injury, and involved jump activities that progressed over the course of the study. Testing was conducted both pre and post training using high-speed video analysis of subjects swim start characteristics. Vertical jump performance was also measured both per and post training. In order to ensure validity of result the control group was monitored with respect to start to practice, to ensure control.

Starting Procedure:

Starting procedure followed competition protocol. The subject was instructed whilst on the block to "take your marks". Once subject was observed to be stationary the starting signal was activated. On activation of the starting signal the subject executed a race start swimming through a 5-meter mark.

High-Speed Video Analysis:

A high-speed video camera was positioned above, and 5-meters, from the subject and the pool and Subject performed three trial race starts that were filmed at a rate of 200Hz. The most consistent of this trial start were averaged and analyzed. The kinematic parameters measured from the video data include: Block time (BT)- the time from starting stimulus until take-off from the block; Start time(ST) – the time from starting stimulus until the first contact of the swimmer with the water, and; 5m time (5m T): the time from starting stimulus until the swimmers' head reaches the 5m mark.

Vertical Jump Test (VJ):

Vertical jump performance was measured to assess the explosive strength of the subjects' lower body. Subjects performed three trials and the highest of these trials was recorded.

RESULTS AND DISCUSSION:

Results of both pre and post VJ, BT, ST, and 5mT are presented in Table 1. The results showed that there was a significant difference between PG pre and post VJ. This significant increase shows that the plyometric training helped develop lower body explosive strength.

Table 1:

Mean results for two groups showing both pre and post VJ test and video analysis

	VJ (cm)		BT (sec)		ST (sec)		5mT (sec)	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
(PG)	39.7	44.2*	0.83	0.812	1.139	1.115	1.809	1.74.
(C)	33.9	34.3	0.864	0.849	1.166	1.137	1.826	1.829

There were no significant changes in PG and C for pre and post BT, ST, and 5mT. Subjects in PG were not required to practice race start over the 6-week period, which could suggest a lack of transfer to skill performance. There is possibility for future research to look at this. Subjects in PG were novices at plyometric training. Therefore, the training was light to moderate intensity to reduce injury. Such training is non-specific to the times during which force is expressed in swimming starts. Force production in swimming starts appears to be expressed relatively over a larger range of time (i.e 400-500ms) compared to that of plyometric exercises (160-200ms). Possibly more intensive plyometric exercises need to be used to elicit results, or, a longer training study need to be adopted.