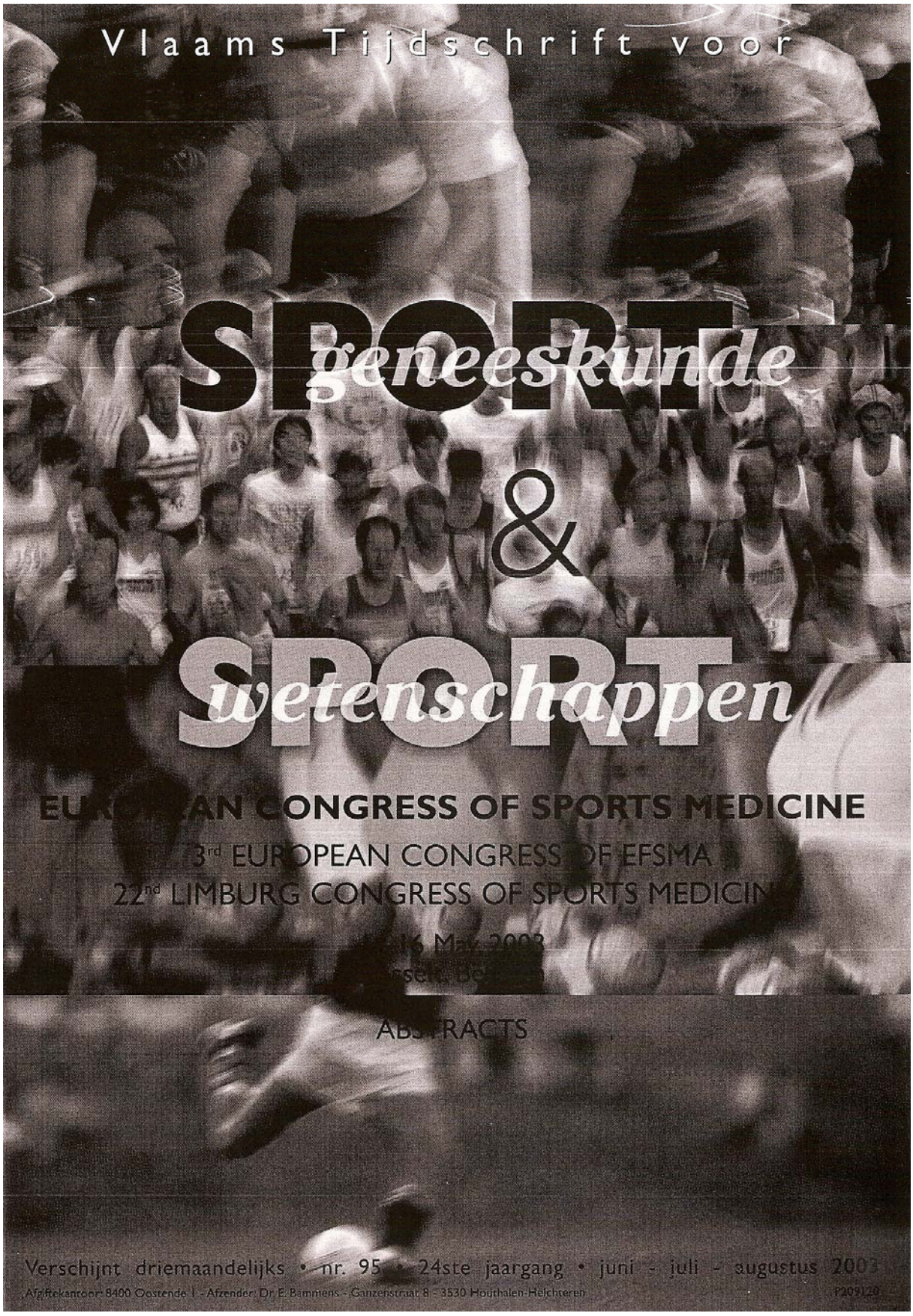

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ISOKINETIC PROFILE OF JAVELIN THROWERS AND RELATIONSHIP TO FIELD TESTS

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In the throwing activities, the repetitive demands of the sport place the shoulder under maximum stress. Distraction forces at the glenohumeral joint during the acceleration phase are 1 to 1.5 times that of bodyweight (1). The main source of stability is balanced by muscular control (2). With that in mind, quantitative, objective measurement of strength represents unavoidable exam in evaluating shoulder function (1). Our study concerned javelin throwers. The aims were twofold:

- to determine the throwers profile concerning morphology features and isokinetic assessment,
- to correlate isokinetic data with field performances.

Seven male javelin throwers (mean age 24 +/- 2 years, height 187 +/- 5 cm, weight 82 +/- 10 kg) and sedentary subjects (mean age 24 +/- 3 years, height 178 +/- 4 cm, weight 70,5 +/- 5 kg) participated in this study. We assessed the shoulder internal (IR) and external (ER) rotators on a Cybex Norm dynamometer, evaluation performed in lying supine at 90° of glenohumeral abduction in the frontal plane. The protocol included concentric exertions at angular speeds of 60°/s, 240°/s and 400°/s (respectively 3, 5 and 5 repetitions). Afterward, the rotator muscles were submitted to eccentric angular speed of 60°/s (4 repetitions). Before isokinetic evaluation subjects performed throwing tests using successively a javelin and a knockenball (both weighed 800 g).

In side to side comparison, the javelin throwers showed a dominant effect for the IR in all tested speed and at 240°/s for the ER muscles. Considering the body normalized PT, no significant difference was found between the two populations, whatever muscle group and contraction modalities. Classical shoulder strength ratios (ER/IR) gave lower values for the dominant throwers arm in relation with the increase of IR muscles and weak ER adaptations.
Correlation analysis revealed that athlete ER performances present a very satisfactory level of correlation ($0.73 < r < 0.88$) with the javelin throw test and the personal record.
Consequently, ER strengthening exercises would be proposed to javelin throwers, at once to restore the agonist-antagonist balance in rehabilitative or preventive programs and with the aim of enhancing the javelin throw performance.

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