MEXICAN JUNIOR TRIATHLETES RUNNING KINEMATIC RELATIONSHIP ON A MAXIMAL INCREMENTAL TEST WITH THE ELASTIC EXPLOSIVE STRENGHT MANIFESTATION

[1,2]Ramón Maañón López, [1,2]Silvia González Pereiró and [1,3]Daniel García Salazar [1,2]Javier Mon Fernández

[1]Investigation Sports National Commission Area from Mexico,

[2]A Coruña University (Spain); email: jmon@triatlonmexico.com, web: www.simedar.com

[3]National Coaching University (México)

INTRODUCTION

The aim of this study is to determine the existent relationship between running kinematic during a progresive incremental test (MAST) and the elastic index (EI) in Mexican Junior Triathletes. This sport is characterized by the small possibility of an intervention of the elastic muscular component (EMC), due to the contraction type conditioned by the pedalling technique, movemment where the Stretch-Shortening Cycle (SSC) it is not manifested in, as well as in the high training volume that this segment require.

METHODS

19 subjects from Mexican National Junior Team were masured. Values are shown (Average± SD), male N=11, Age: 17.71 ± 0.83, Weight: 61.28 ± 3.67, Height: 172.53 ± 5.69, HR_{max}: 203.5 ± 2.12; Female: N= 8, Age: 17.17 ± 1.16, Weight: 53.83 ± 5.21, Height: 160.4 ± 6.88, HR_{max}: 192 ± 4.24. It was used: Cosme Indoor treadmill, Larco Minessota Jumping platform with Michecevi Software, Heart Rate monitor Polar, Canon SD 40S camera for motion capture, Dart Fish 4.5 and VirtualDub 1.6.7 for video analysis.

Firstly a 10 min warm-up of continual foot run (CFR) at 2.22 $m^{.}s^{-1}$. Stretching of evolved muscles, 3 correct jumps at medium intensity, followed by 2 maximal squat jumps (SJ), 1 min rest, and 2 maximal counter movement jumps (CMJ) and 1 min rest. Best jump correctly performed was registered. Then 5 min of CFR at 2.22 $m^{.}s^{-1}$ stretching, and then the MAST begining at 2.22 $m^{.}s^{-1}$, increasing 0.27 $m^{.}s^{-1}$ each 2 minutes until exhaustion.

The variables were extracted from the analysis of 10s filmed at 60 fps in the middle of each phase of the MAST. Contact time (Ct) ($m^{.}s^{-1}$) and Stride frequency (Sf) (Hz), Stride length (Sl) and Flying time (Ft) were analyzed. In order to determinate if differences exist between the analyzed variables a Repeated Measure ANOVA was carried out, and MULTIVARIANT test. To determinate de variables relationships Pearson Correlation, average comparison and contingence analysis.

RESULTS AND DISCUSSION

Values of analyzed parameters are shown in (Table 1). An efficient runner is the one who is characterized, among other factors by lower Ct, variable that determines Sf when running under 6 $m^{.}s^{-1}$ [1]. Nor correlations were found between CMJ and Ct, nor with the other analyzed kinematic variables (Sl, Sf, Ft). The degree of EI employment seems not to be a component that allows the characterization of performance during a MAST in Junior Triathletes due to the required SSC is lower than 250 ms [2].
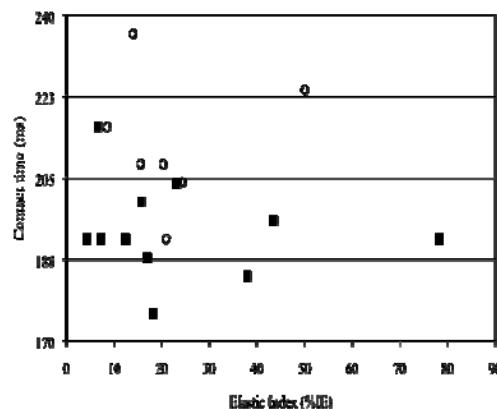
Figure 1: Dispersion graph show lack of relationship between Ct and %IE. Black squares are men data and circles are women.

CONCLUSIONS

Performance in activities that implies slow SSC will be principally due to the eccentric phase, which allows a higher time to develop optimal muscular tension [3]. Tension what could be altered with higher volumes in cycling segment training.

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Table 1: Values of Jumps analyzed and Maximal Aerobic Velocity (MAV), degree of EI employment (CMJ-SJ).

	SJ (cm)	CMJ (cm)	CMJ-SJ (cm)	IE (%)	MAV (Km$^{.}$h^{-1})
Men (N=11)	30.49 ± 5	37.06 ± 4	6.57 ± 4.5	23.98 ± 20.84	18.45 ± 0.61
Women (N=8)	23.08 ± 3	27.78 ± 3.1	4.70 ± 2.32	21.15 ± 11.81	15.38 ± 1.32