

IN-SHOE PRESSURE ANALYSIS DURING *AERO JUMP* IN DIFFERENT CADENCES

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INTRODUCTION

The *Aero Jump* is a gym modality with aerobics characteristics, realized with movements and jumps above a little trampoline (figure 1).



Figure 1: Little trampoline of *Aero Jump*

The quantitative description of biomechanical aspects of the human movement is related to the forces that cause the observed movement, as the repercussions in the analyzed phenomenon [2]. The ground reaction forces investigation and the distribution of dynamic pressure in the foot surface, provide important knowledge about the characteristics of the mechanical overload on the human body, in static and sporting situations [1]. The popularizing of the physical activity, besides the benefits for the promotion and maintenance of the health can cause a consequence: injuries [3]. The purpose of this study was to describe the distribution of dynamic pressure during five movements of *Aero Jump* accomplished in different cadences: 132 bpm (beats per minute) and 145 bpm.

METHODS

The sample was composed by three female (age between 18 and 23 years old, average height of 1.69 m and average weight of 602.66 N), with experience in the *Aero Jump*. The acquisition data was realized by F-Scan version 3.821 (Tekscan, Inc.) and little trampoline *Physicus*[®] (Physicus, BRA), with dimensions of 20 cm (height) and 96 cm (diameter), supporting until 1500 N. The acquisition frequency selected was 120 Hz, during five seconds to each trial.

Table 1: Peak pressure (g/cm²) in different cadences.

Movement	Cadence 132 bpm		Cadence 145 bpm	
	Right foot	Left foot	Right foot	Left foot
Basic	2583.4	2221.31	2984.48	1864.26
Double punchinello	2590.08	1961.9	2930.22	1642.88
Simple punchinello	2311.27	1712.61	2962.57	1708.6
Double twist	2373.95	1756.58	2082.67	1728.47
Simple twist	2594.67	1911.07	2157.9	1884.65

selected movement was: basic, double punchinello, simple punchinello, double twist and simple twist. Each subject repeats three times the movements, in each cadence investigated. The all intervals of support were included in the descriptive statistical analysis.

RESULTS AND DISCUSSION

According to table 1, the pressures in the right foot were larger than in the left foot in all movements and in both cadences, varying from 12.7% for the movement simple twist until 43.9% for the movement double punchinello, both in the cadence of 145 bpm. In the movements basic, double punchinello and simple punchinello, the larger pressures was observed in the cadence of 145 bpm. For the double twist and simple twist the larger pressure was observed in the cadence of 132 bpm.

CONCLUSIONS

The results suggest that when cadence increases an increase in the pressure was observed for movements basic, double punchinello and simple punchinello. For movements double twist and simple twist was observed a decrease in pressure according to cadence increased. In summary, the movements of *Aero Jump* realized in elevated cadences don't have a linear relationship with the increase in the pressure.

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