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A STABILOMETRY ANALYSIS OF PEOPLE WITH STROKE

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ABSTRACT

This paper concerns research into balance keeping by people after stroke. Measurements have been carried out in the Rehabilitation Centre “Repty” in Tarnowskie Gory, Poland. Analyses of balance parameters and stress distribution obtained for patients and healthy people are presented in the paper.

Keywords: biomechanics, stabilometry, stroke.

INTRODUCTION

In neurology stabilometry measurements can be used to evaluate the degree of neurological disturbances or rehabilitation progress. Injury of nervous system has significant influence on person's stability and might be the reason of falls. This can lead to personal activity limitations. Therefore, balance analysis is the essential part of comprehensive examination of people after stroke. Obtained results can be compared with standards (obtained for healthy people) but also comparative analysis for patients with different symptoms is performed very often (Mraz, 2001, Mansfield, 2011).

There were 23 patients of Rehabilitation Centre “Repty”, suffering from stroke complications, who have taken part in the research. Additionally measurements, carried out for 19 healthy people, enabled standard results determination. During measurements each person had to stand 30 seconds motionlessly with open eyes on a measurement platform (FDM-S ZEBRIS System). The following parameters have been analyzed:

- path length
- ellipse area
- symmetry of left and right side
- symmetry of forefoot and rearfoot.

RESULTS AND CONCLUSIONS

Carried out measurements and obtained results enabled performance of comparative analyses. Results of healthy and ill men and women were compared with each other. Similar analyses have also been carried out for patients with right-sided and left-sided paresis. It has been stated that there were no significant differences between healthy women and men in all determined quantities, whereas among patients such differences have been found: longer path was measured for ill women (567 mm - women, 484 mm - men) but larger ellipse area for men (104 mm² - women, 177 mm² - men).

Distinction of results between right-sided and left-sided paresis has showed some other relationships. Patients with left-sided paresis had longer path and smaller ellipse area (fig. 1). Also in symmetry analysis there were differences between these two groups of patients. While it is true that all patients tried to take care of paretic limb (less reaction measured for this side), the left-sided paretic patients had greater value of reaction under rearfoot of non-paretic side and similar value of reaction under rearfoot and forefoot of paretic foot. The right-sided paretic patients had greater value of reaction both under non-paretic rearfoot and paretic forefoot (fig. 2).

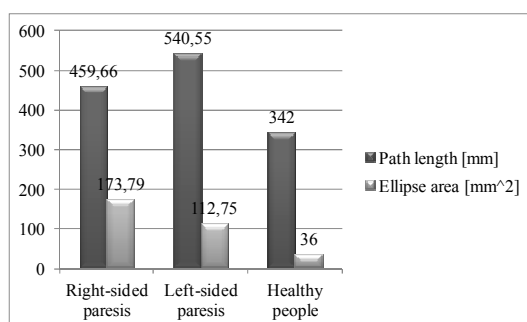


Fig. 1 - Path length and ellipse area for healthy and ill people

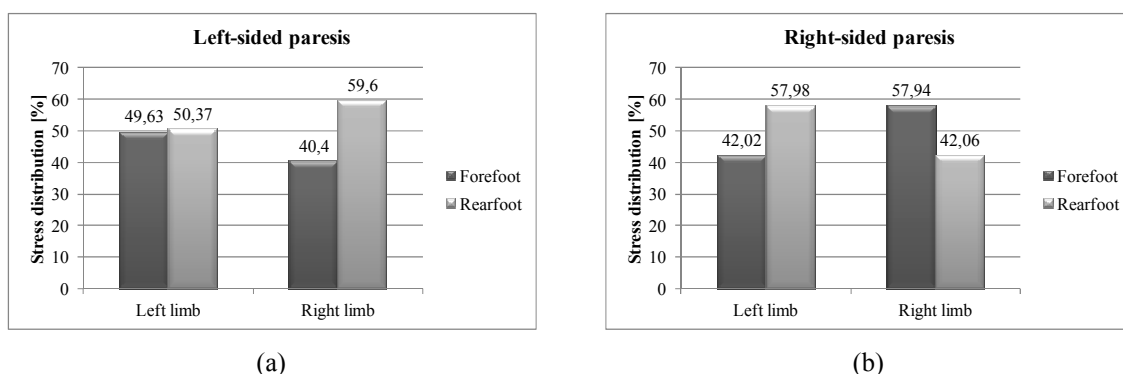


Fig. 2 - Stress distribution for patients with left-sided (a) and right-sided (b) paresis - distinction between forefoot and rearfoot

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