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Baropodometric Biofeedback Device for Changing the Walking Strategies

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INTRODUCTION

Measurements of plantar pressure distribution play a crucial role in the assessment and the treatment of foot disorders or, more generally, in gait disturbances [1]. They enable us to study and quantify the events on the foot-ground interface and could be used in the development of a biofeedback method. Recently, Descatoire et al have developed a baropodometric

METHODS

Eighteen healthy subjects without foot or gait abnormalities took part in this investigation. They first performed a walking test on the floor (100 consecutive steps) to record the peak plantar pressure (PP) distribution in a diagnostic condition. Then, subjects were told to relieve the fifth metatarsal head region (M5) with accuracy of the right foot only; during 100 other steps performed using the Biofeedback system. When subjects relieve M5 by 5% to 20% of the PP reference, then the step is considered as a success. Each subject had to perform the foot relief under two conditions. The first condition (Control) corresponded to the non biofeedback condition. The second condition corresponded to the biofeedback condition. From the recording, we computed the Pressure to Time Integral (PTI) at each of the 6-sensor locations for each foot.

RESULTS

The descriptive results showed that subjects in the control condition performed 20.6% of success steps while in the biofeedback condition the percentage was 53.6%. Results

showed that a successful step did not induce significant PTI repercussion under the contralateral foot and unloaded foot.

OBJECTIVE

The aim of the study was to determine the feasibility of changing and controlling the walking pattern using the device.

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CONCLUSIONS

From the descriptive results, the supplemental artificial information delivered by the biofeedback device is of interest to initiate a new walking pattern. The biofeedback procedure should be promising to modify gait strategies in pathological gait such as in a diabetic population.

KEYWORDS

biofeedback, artificial feedback, plantar pressure, walking pattern, gait disturbance

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