



# Motor control of migraine patients under higher levels of sound

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### Introduction

Under a typical sound environment context, individuals with migraine showed balance control deficits on a series of functional activities as compared to healthy controls, which helps to explain why migraineurs report more falls than controls. However, it is not established, the effects of intensity sound in migraine patients during functional tasks. Based on the hypersensitivity to sound in people with migraine, not only during the migraine attack but also in the interictal period, the exposure to loud sound may have an impact on motor control in this population. This study aimed to investigate the levels of discomfort induced by sound in patients with migraine and healthy controls and to evaluate the anticipatory control with increasing levels of auditory disturbance.

### Methods

This cross-sectional study evaluated 51 women with migraine and 21 healthy women. They performed 3 different walking tasks: crossing an obstacle, stepping up and stepping down a curb, in a control situation and with a loud sound condition ( $\cong 90$  dBA). The Research Ethics Committee approved this study (process HCRP n° 16210/2015). It was used t-tests, Spearman tests, and repeated-measures mixed ANOVA,  $\alpha=5\%$ .

### Results

Migraine group presented higher discomfort induced by sound ( $p=0.001$ ). In the obstacle task in the ambient condition, migraine group had greater step width than control group ( $p=0.038$ ). For step up task, there were main effects of condition for both leading limb ( $F_{1,96}=7.23$ ,  $p=0.001$ ) and trailing limb ( $F_{1,98}=9.90$ ,  $p<0.00001$ ) in horizontal distances. For both variables, these distances increased for sound ( $p=0.002$  and  $p<0.00001$ ) compared to ambient condition. For step-down, there were no group main effects or group by condition interactions for any variable.

### Conclusion

Migraine is related to higher discomfort induced by sound compared to controls. There was no difference between groups for the ambient condition, except for the step width in the obstacle task. There was an effect of the sound increment in both groups on the variable horizontal distance in the step-up task, the inadequate foot placement in relation to the obstacle/curb increases the risk of falls, so the sound increment may increase the risk falls in migraine and healthy individuals during some tasks. Although the discomfort induced by sound was higher for the migraine group, the increment in these stimuli did not make a difference between groups when walking on uneven terrains.

**Keywords:** Headache, Walking, Phonophobia