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Walking *vs.* Nordic-walking: the metabolic demands

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Introduction

In the last decade many people have participated in several fitness program to improve the quality of life. Such programs aimed at increasing the steps/day number, as a healthcare measure (1), or strengthening upper/lower limb tonic muscles (2). Indeed, over last years Nordic-walking program (Figure 1) have seemed to involve an increasing number of people, but few study have analyzed the physiological effort during Nordic-walking compared with Walking. Therefore, we aimed to assess the metabolic demand during Walking and Nordic-walking in a natural environment.

Methods

Fourteen people physical active subjects (3 males – 11 females; with Age 37±8 yrs) voluntarily participated in this study. After two weeks of familiarization with Walking (WK) and Nordic-walking (NW). All subjects performed in a game reserve along a slightly more than 2.5-km course with both WK and NW randomly, with running shoes (Cat A3) and poles (Gabel). During the trials each subject was monitored with GPS receiver (gait speed; iPhone 6 with *Endomondo* app) and heart rate monitor (heart rate, HR; Suunto Memory-belt). HR was normalized as % of it s subject-specific maximum value (HRMAX=220-age (yrs)). The data were showed as mean±SD. ANOVA with repeated measured was applied to assess the significant effects for each variable between the two gaits and it was calculate Fisher value followed by multiple comparisons to locate the differences. The significance level was fixed at $p<0.05$.

Results

During WK and NW the speed was similar (5.80±0.48 and 5.82±0.52 km/h with p=0.165). Average HR was 60. 6±9.0 and 67.6±12.1 $\%HR_{MAX}$ ($F_{1.12}$=11.778, p=0.004) in WK and NW, respectively (Figure 2A). Maximum HR was 68.3±9.3 and 74.3±12.0 $\%HR_{MAX}$ ($F_{1.12}$=12.447, p=0.004) in WK and NW, respectively (Figure 2B).

Figure 1. Nordic-walking gait

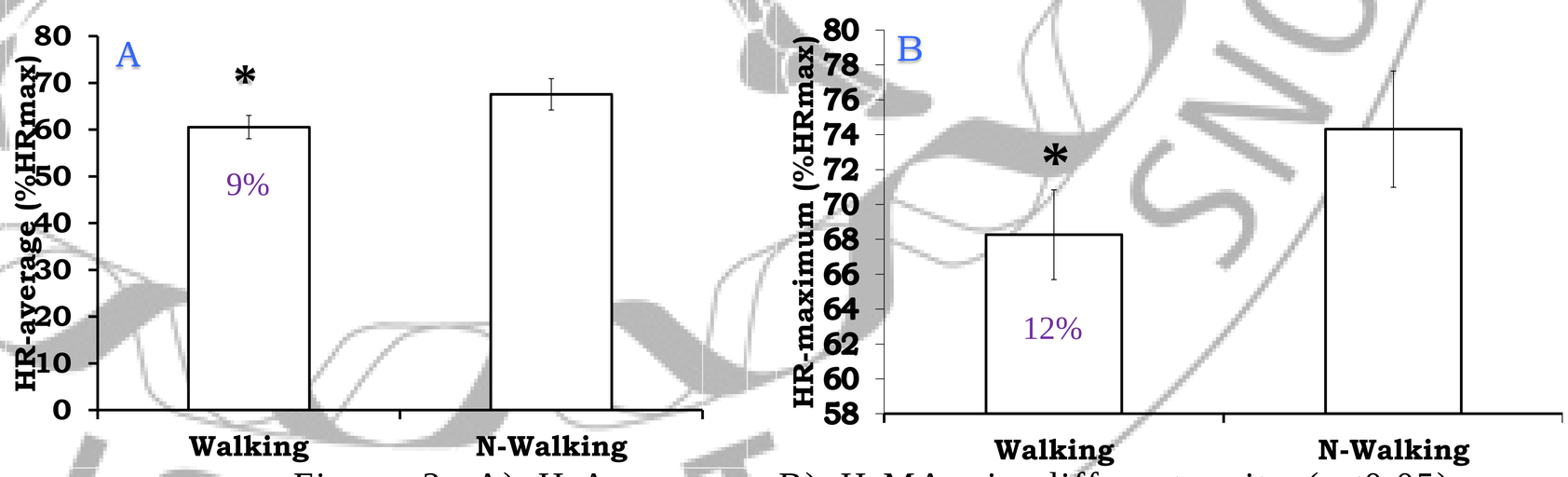

Figure 2. A) HrAverage – B) HrMAx in different gaits ($p<0.05$)

Discussion

This study showed that during NW the metabolic demand was increased (~11%). The increased metabolic demand could be justified by the NW technique. During NW, the upper limbs are used to operate the poles to assist the progression. Based on our data NW could be used to increase the metabolic demand and improve the physical fitness without increasing the physical activity time. Finally, NW technique could be used to strengthen upper limb muscles and to improve gait stability in the elderly.

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