findings, this group of athletes with excellent balance control did not demonstrate changes to a secondary visual attention task while balance control was challenged. Additionally, the group with a previous SRC, who recovered and returned to full activity, demonstrate that there are no residual effects from their previous concussions impacting their balance control abilities when challenged with a secondary task. This paradigm is challenging and may be more useful in determining readiness to return to sport following a SRC in the early stages of recovery.

P3-H-50: ***Immediate effects of wearing a passive exoskeleton on spatiotemporal gait parameters.***

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BACKGROUND AND AIM: In the last decade, there has been a significant interest in the use of passive exoskeleton in the workplace. These technologies are identified as a promising ergonomic intervention to reduce the risk of work-related musculoskeletal disorders. Indeed, passive exoskeletons aim to reduce the workload associated with certain specific tasks such as repetitive lifting or moving loads. However, there is a lack of field-based evidence on the effects of using an exoskeleton on motor control during daily activities. The aim of this study was to examine whether wearing a passive exoskeleton for the upper or lower limbs affects spatiotemporal parameters during gait. METHODS: The study was completed by 18 healthy adults (mean age 22.9 [SD 1.1] years; 1.74 [SD 0.10] m; 68.9 [SD 0.1] kg; 9 males, 9 females). Each participant performed walking at a natural pace under 4 conditions: 1) without an exoskeleton (No), 2) with an upper limb exoskeleton (Exoup), 2) with a non-activated lower limb exoskeleton (ExoLo-), and 4) with an activated lower limb exoskeleton (ExoLo+). For each condition, data from 6 walking trials were collected and included for analysis. Each condition was realized in a random order. A GAITRite analysis system recorded spatiotemporal parameters of gait : 1) velocity (cm.s-1), 2) cadence (step.min-1), 3) step length (cm), and 4) double stance phase period (% cycle). For each parameter, we performed a Friedmann test to identify significant difference between the conditions. Depending on the results, we used post hoc analyses (Wilcoxon signed rank test) RESULTS: No significant difference was observed between conditions for gait speed and step frequency ($p = 0.09$ and $p = 0.625$, respectively). On the other hand, the step length was impacted by the experimental conditions ($p = 0.0009$). Post hoc tests revealed highly significant differences between No vs Exoup ($p = 0.001$), No vs ExoLo- ($p = 0.0005$) and No vs ExoLo+ ($p = 0.0004$). No significant difference was observed between the different exoskeleton conditions. We also observed a significant increase when wearing the exoskeleton in double stance period compared to the No condition ($p < 0.01$). CONCLUSIONS: Wearing a passive exoskeleton does not affect spontaneous gait speed. However, step length is reduced and double stance phase period is prolonged. Surprisingly, the changes in gait pattern are similar regardless of the type of exoskeleton (ExoLo or Exoup) and whether the assistance is activated or not (ExoLo+ vs ExoLo-),. When wearing an exoskeleton reduces step length, participants keep the same rhythmic organization of gait.

Further research is needed to determine the discomfort or resistance effects of exoskeleton wearing on gait and how to explain these effects in terms of biomechanical load, cognitive or psychosocial components. The effects of prolonged wearing on spatiotemporal gait parameters should also be investigated. FUNDING:This study was supported by the European Regional Development Fund (Interreg FWVI NOMADe)

P3-H-51: ***Theta burst stimulation of the posterior parietal cortex in healthy young adults, does it affect upper limbs and lower limbs differently? A sham-controlled study.***

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BACKGROUND AND AIM: The posterior parietal cortex (PPC) is a cortical area involved in planning and executing of visually guided locomotion. Several studies have demonstrated that the PPC is functionally and anatomically connected to the primary motor cortex (M1), which has different anatomical representations for the upper and the lower limbs. Previous studies have applied repetitive transcranial magnetic stimulation (rTMS) on the PPC to modulate the cortical excitability of upper limb, however there is a paucity of studies targeting lower limb. Therefore, the purpose of this study is to determine if the excitability of the upper and the lower limbs differs when targeting the PPC with rTMS. METHODS: Ten healthy young adults (aged 26±4) were recruited. The study consisted of 4 sessions conducted at least 72 hours apart. During the initial session, hotspots location for the first dorsal interosseous (FDI) and tibialis anterior (TA) were determined, as well as motor thresholds. On the three experimental sessions they received either inhibitory rTMS, excitatory rTMS or sham rTMS over the PPC. To quantify the effects of rTMS on the PPC, the PPC-M1 excitability was assessed using a dual-coil protocol, with an interstimulus interval of 4ms, a conditioning stimulus of 90% resting motor threshold (RMT) of the FDI and a test stimulus that evoked 1 mV on the target muscle, in both hand and leg representations. The measurements were acquired immediately before, and at three timepoints (0,20 and 40 minutes) after rTMS. RESULTS: Preliminary data of 10 participants was acquired and analyzed. In all participants we were able to measure the RMT of FDI and TA. But only in 5 participants it was feasible to reach a response of 1mV on the TA. Mean FDI RMT was of 44 ± 9.0% of maximal stimulator output (MSO), and mean TA RMT was 51 ± 14%MSO. There was no significant difference in the interindividual variability between FDI RMT and TA RMT (P=0.387). Additionally, there was no significant changes on the cortical excitability of FDI and TA when preconditioned by PPC, before and after the experimental protocols. CONCLUSIONS: Preliminary results showed that in 50% of the participants it was not feasible to reach 1mV responses on the TA. This suggests that not everyone will be a candidate for lower limb stimulation, due to the unfeasibility to modulate cortical excitability. PPC did not induce changes in the cortical excitability of the FDI and TA, before and after the experimental protocols, suggesting that functional connection between PPC-M1 cannot be modulated by stimulation of the PPC.