

Effects of Nintendo Wii Fit Plus® balance program training on postural stability in Multiple Sclerosis patients: a pilot study.

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Introduction

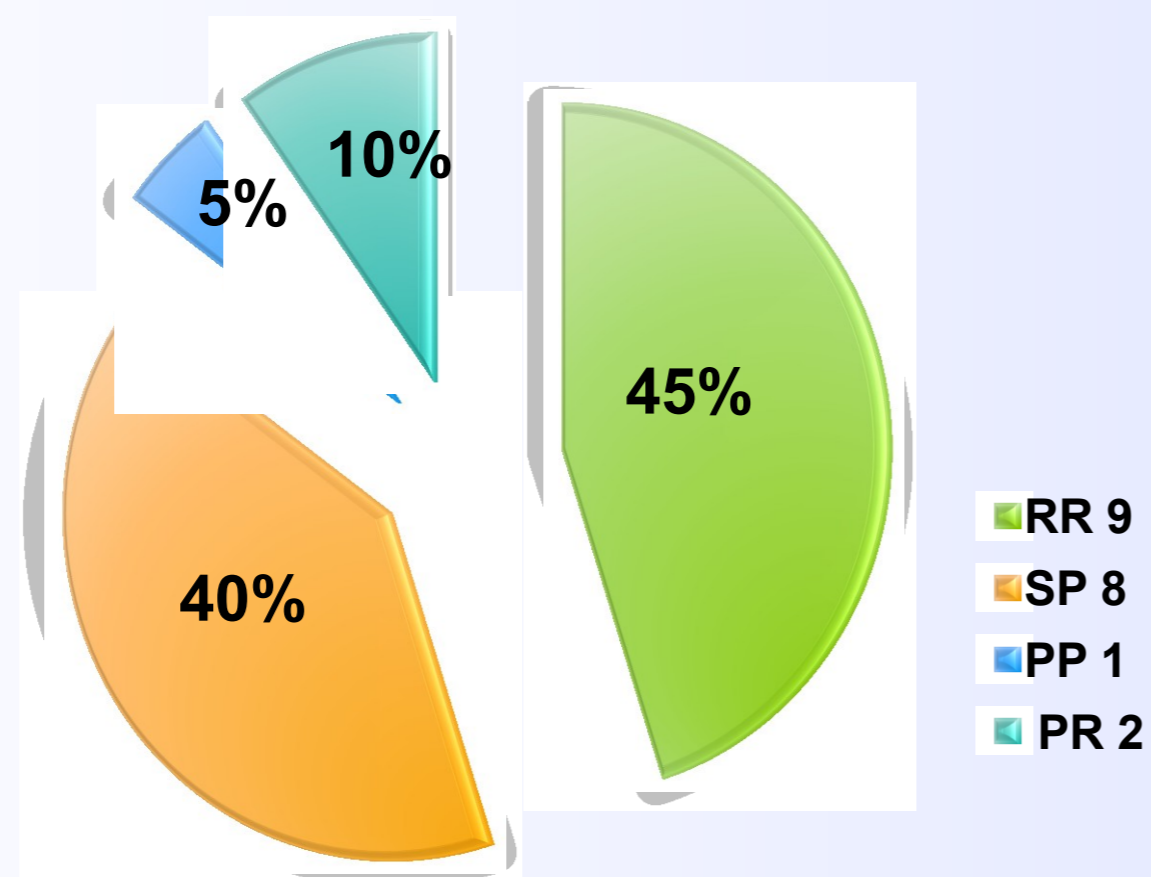
Multiple Sclerosis (MS) is a demyelinating disease, typically affecting young adults. Postural instability is common in PwMS and it has been identified as a major intrinsic risk factor of falling which can potentially be influenced with intervention.

Materials and methods

We enrolled PwMS, with mild-moderate disability (EDSS 5.7 ± 0.9), referring to the MS Centre of the University of Catania from September 2013 to June 2014. Participants underwent 32 individual sessions of balance exercise using Nintendo Wii Fit Plus®. They were assessed at baseline (T0) and at the end of rehabilitation program (T1) by Neurocom Balance Manager® evaluating Center of Pressure (COP), through modified Clinical Test of Sensory Interaction on Balance (mCTSIB). Several validated scales for functional independence measure (FIM), activities of daily living (Barthel Index, BI) and balance (Berg Balance Scale, BBS) were also performed.

Results

20 PwMS were finally enrolled, 9 women (45%). At T1, we found a significant improvement in Total Path Length-open eyes (TPL-OE) (T0 527.9 ± 105.4 vs T1 504.6 ± 107.1 , $p < 0.05$), Sway Area-open eyes (SA-OE) (T0 113.5 ± 83.8 vs T1 82.2 ± 63.2 , $p < 0.05$), Mean sway velocity-open eyes (MSV-OE) (T0 52.8 ± 10.5 vs T1 50.5 ± 10.7 , $p < 0.05$). Furthermore, patients showed significant improvement in FIM motor score (T0 76.8 ± 5.6 vs T1 82.4 ± 4.1 , $p < 0.05$), BI (T0 84.3 ± 9.7 vs T1 87.3 ± 9.6 , $p < 0.05$) and in BBS (T0 38.4 ± 8 vs T1 44.6 ± 7.3 , $p < 0.05$). Moreover, there were no significant differences between T0-T1 in closed eyes trials. A significant correlation between SA-OE and BBS ($r = -0.54$; $p = 0.01$) was found.

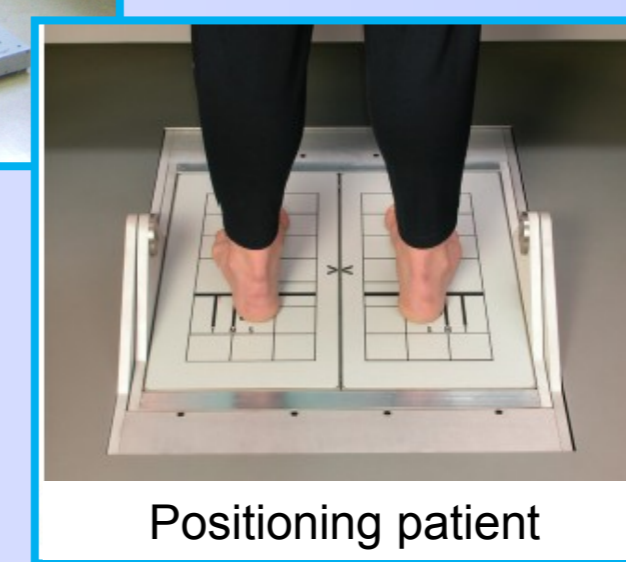


Feet positioning

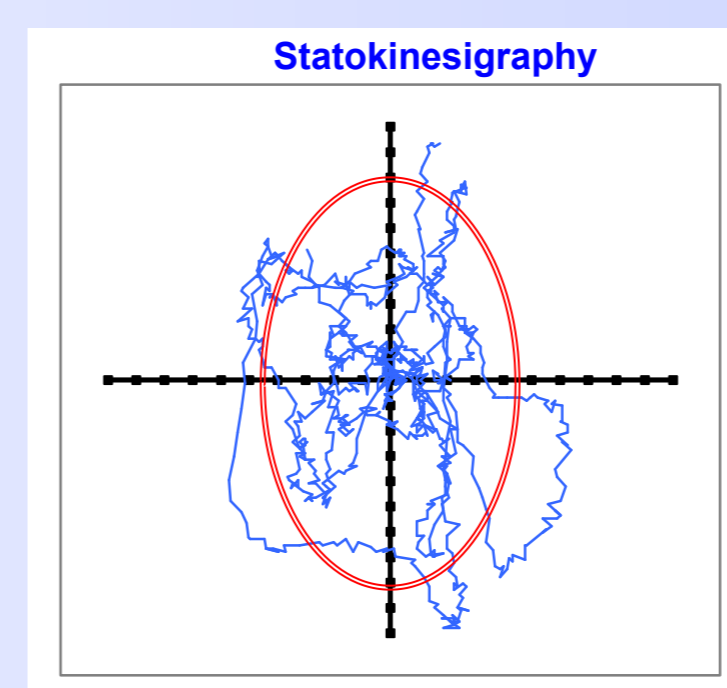
S (Short): 76-140 cm

M (Medium): 141-165 cm

T (Tall): 166-203 cm

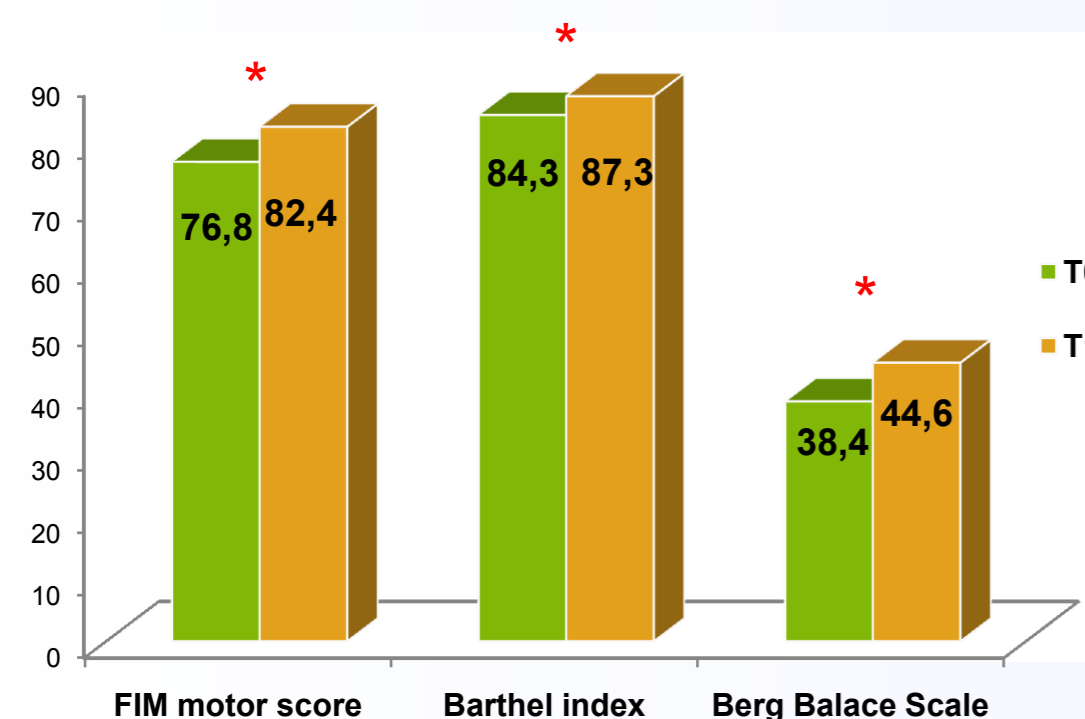
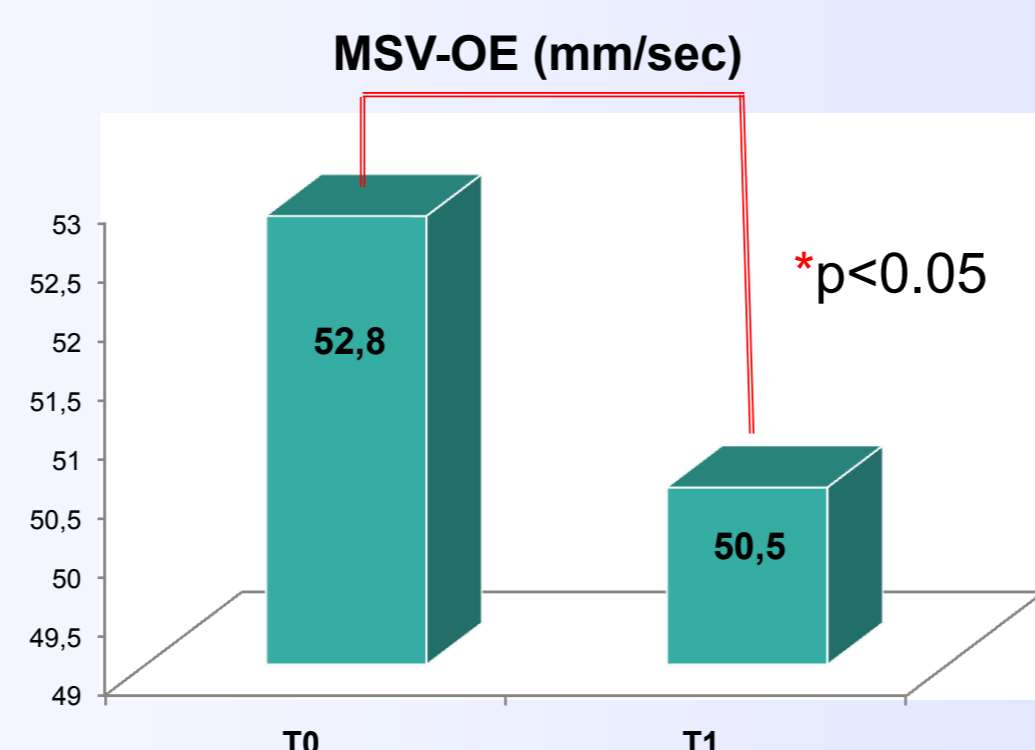
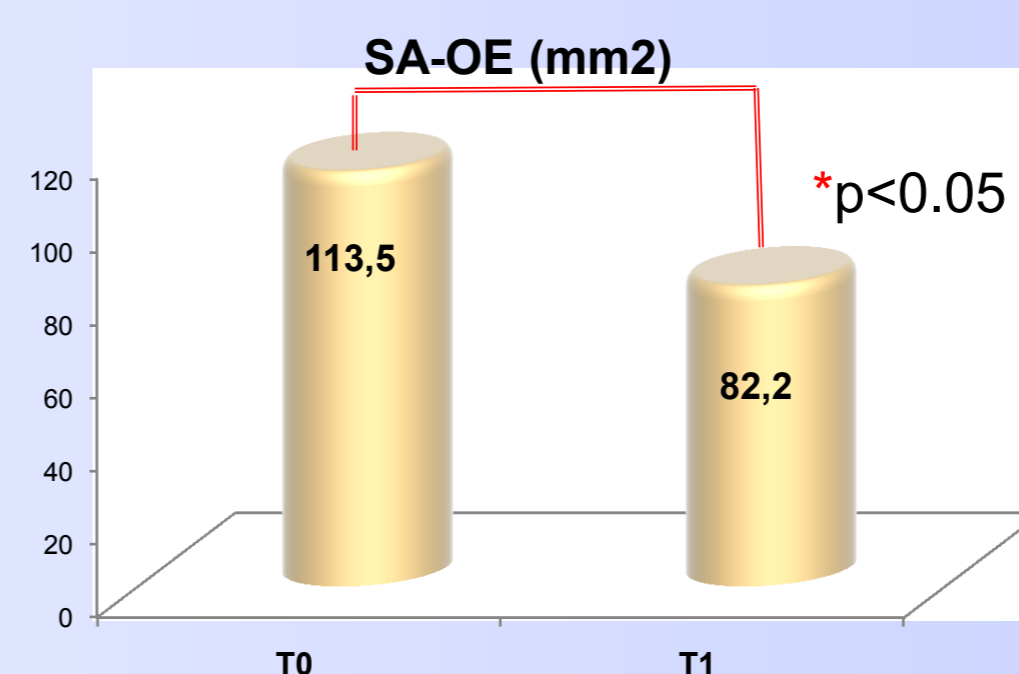
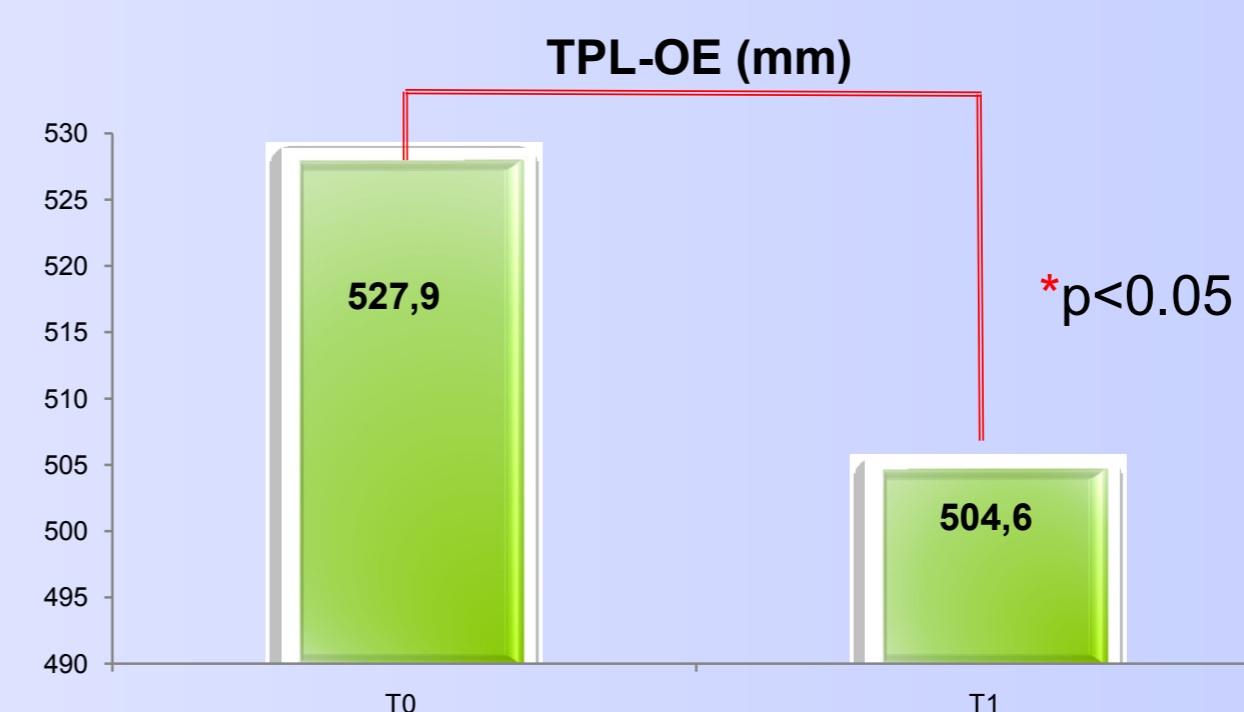


Positioning patient



Age	47.3 ± 7.9
Height (cm)	169.6 ± 9.4
Weight (Kg)	76.6 ± 21.5
Body Mass Index (Kg/m ²)	26.4 ± 6
EDSS	5.7 ± 0.9
Age of onset	28.8 ± 9.6
Disease duration	18.8 ± 8

Duration of treatment (days)	32.3 ± 11.2
Type of treatment	Nintendo Wii
Single section	45'
Section treatment	5 x Week



Conclusion

Results of this pilot study demonstrated that Nintendo Wii Fit Plus® balance exercise training may improve balance functions in PwMS. Among the different stabilometric parameters, SA-OE was the most sensitive measure to detect postural control gained after Nintendo Wii rehabilitation.

References

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