# USE OF THE ORCITI DEVICE IN THE GAIT OF PEOPLE WITH MULTIPLE SCLEROSIS

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## INTRODUCTION

Multiple Sclerosis (MS) is an inflammatory, demyelinating, neurodegenerative disease affecting the central nervous system (CNS)[1] .

The clinical manifestations of MS are very heterogeneous in symptoms and signs[2.] During the development of the disease, most of the neurological functional systems are usually affected, with motor (90%), sensory (77%) and cerebellar (75%) disorders being the most common, followed, less frequently, by brainstem, sphincteric, mental and visual disturbances[3].

People with MS have gait and balance difficulties that can significantly limit activities of daily living and increase the risk of falls[4]. A common symptom during walking in people with MS is foot drop, which is characterized by decreased dorsiflexion of the ankle during the swing phase, increasing the risk of falling[5].

ORCITI is an exomuscular robotic device that aims to help people with different pathologies.

The **aim** of the present study was to analyze the gait and balance ability with the Orciti orthosis compared to a foot-up and without any type of orthosis, in people diagnosed with MS.



## METHODOLOGY

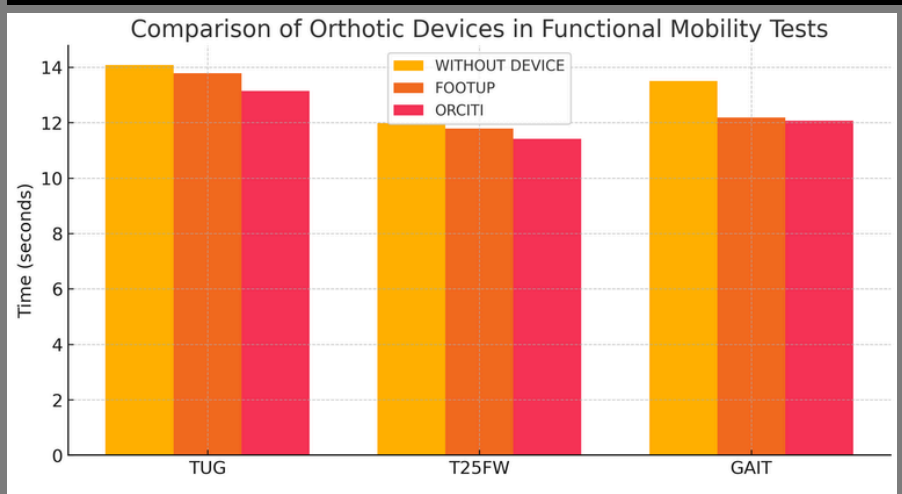
A prospective cross-sectional descriptive observational study was conducted.

The participant recruitment model was by non-probabilistic convenience. Participants were referred by COCEMFE Asturias and University Clinic of the Faculty Padre Ossó-INYPEMA.

Inclusion criteria were to be diagnosed with MS (according to the McDonald criteria)2 in any of its stages, to be of legal age and not to have suffered a flare-up in the last 12 months.In addition, participants had to present difficulties in the swing phase of gait and a score between 4 and 7.5 on the Expanded Disability Status Scale (EDSS).

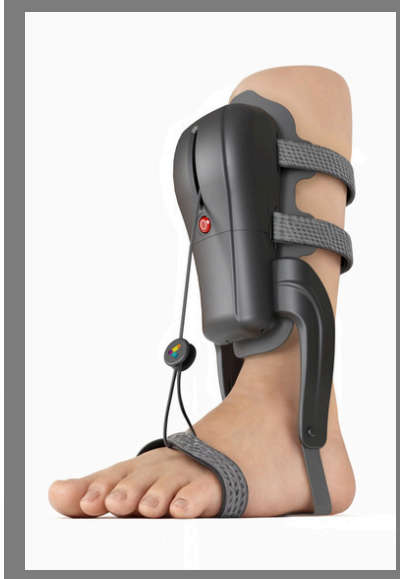
A sociodemographic questionnaire was administered to obtain information related to the independent variables. A total of four assessment tests were administered, in the following order:
Gait Assessment and Intervention Tool scale [6] .
Timed 25-Foot Walk[7] .
Timed Up and Go (TUG)[8].

## RESULTS




Friedman test

| Test | Chi-square ($\chi^2$) | p-value | Significant difference? |
|---|---|---|---|
| TIME UP AND GO | 3.25 | 0.197 | ▯ Not significant |
| T25FW | 2.25 | 0.325 | ▯ Not significant |
| GAIT | 8.72 | 0.013 | ▯ Significant |



## DISSCUSION

Although ORCITI consistently showed lower average times across all functional tests—suggesting better performance—statistically significant differences were only observed in the GAIT test (p = 0.013), according to the Friedman test. Pairwise comparisons did not yield statistically significant results after correction, although a trend favoring ORCITI was observed, particularly when compared to the condition without a device.
These results align partially with previous studies suggesting that dynamic ankle-foot orthoses can improve gait efficiency and reduce energy cost in neurological or orthopedic conditions[9-10] .

## CONCLUSIONS

The ORCITI device showed the best average performance across all functional mobility tests. Statistically significant improvement was observed only in the GAIT test ($p < 0.05$). Although differences in TUG and T25FW were not significant, a trend favoring ORCITI was noted. Further studies with larger sample sizes are needed to confirm these findings.

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