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## **Abstract**

Leprosy is a granulomatous disease that affects the peripheral nervous system, leading to loss of thermal, tactile and pain sensibility. Changes in plantar sensibility and proprioception caused by leprosy might affect postural balance control. The Body Center of Pressure (COP) constitutes the neuromuscular response to changes or accelerations of the body's Center of Gravity and can be affected by orthopedic, neurological or rheumatic injuries. Fifteen multibacillary (MB) and 6 paucibacillary (PB) leprosy subjects were randomly selected, as well as 11 subjects without leprosy for the control group (GC). The MB and PB had their plantar sensibility checked by the Semmens-Weinstein test; all groups had their COP evaluated (stabilometry) using a baropodometer, during standing position with eyes opened and barefooted. The balance variations were measured by the displacement of the COP, as in COP ML (medial-lateral direction) and COP AP (anterior-posterior direction) for right and left feet and total body projection. The stabilometric analysis regarding COP AP revealed no statistically significant difference between groups MB, PB and GC, despite the presence of impaired sensibility in all leprosy patients. The same occurred with the COP ML. The comparison between right and left feet of MB, PB and GC did not show statistically significant differences, although the MB group present the highest variation between the COP projection over right and left feet

The Semmes-Weinstein test is widely used (SWtest) to evaluate plantar sensibility. It consists of nylon wires of the same size and of different diameters, with a variation of strength of 0.05g to 300g and associated colors in this order: green 0.05 g, 0.2 g, blue to violet to 2.0g, 4.0g, dark red to orange to 10g, magenta and red to 300g. The loss of protective sensation in the hands and feet is basically indicated by the lack of response to the stimulus of the violet, blue and green filaments [6].

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The stabilometric analysis regarding AP oscillation revealed no statistically significant difference ( $p=0.15$ ) between groups MB, PB and

COP over the left foot oscillation when compared to the GC, and with the projection over the right foot for the same group, contradicting the literature researched, which demonstrates that PB are more susceptible to variations between right and left. On the other hand, the previous studies on this matter only took into account the distribution of plantar peak pressures, not the COP oscillation.

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This study showed that the impairment of plantar sensibility alone might not be decisive to affect the postural body balance control on leprosy patients. It is important to note that this study was conducted as a pilot, and so the small sample collected could be an important limitation. We believed that further research is needed with a larger number of subjects to ensure a more reliable sample regarding unilateral nerve damage on leprosy patients. Also, further investigation about other mechanisms of postural control such as vision and mobility of the subtalar joint (directly related to proprioception) is required for MB and PB patients in order to elucidate the real intervention of lepromatous neuropathy on the body balance.

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## FYZfYbWg

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