Whole Body Vibration training for Multiple Sclerosis patients

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Abstract

Introduction: The purpose of this study was firstly to investigate whether 8 weeks of whole body vibration (WBV) training was an acceptable form of exercise for patients with Multiple Sclerosis (MS) and secondly what effect it may have on measures of functional capacity.

Methods: Fifteen participants with MS volunteered for WBV training three times a week on a commercialised Galileo Sport™ vibration machine with an oscillating platform. Training consisted of two four week blocks based on an increasing stimulus training programme (overload principle). The first fours weeks involving five sets of 1-min WBV with 1-min rest in between with increasing vibration frequency (15-25Hz, 2.6mm-4.1mm amplitude); the second four weeks training increased to eight sets of 1-min WBV (15-20Hz, 6.1mm amplitude). Functional performance measures (Timed up and Go, Standing Balance, Functional Reach and Timed walk) and quality of life questionnaire (SF-36) were conducted prior to training, at 4 weeks, 8 weeks and 2 weeks (10wk) following the completion of the training.

Results: The 10m walk test showed significant improvements at the 2m, 8m and 10m measure between pre vs. 8wk ($P<0.05$) and pre vs.10wk ($P<0.05$). Timed up and Go demonstrated a significant time effect ($P<0.05$). Standing balance showed significant improvements at pre and 4 week ($p<0.05$) and pre and 10 week ($p<0.05$).

Conclusions: This is the first study to investigate WBV as an exercise training modality for MS patients. It was shown that not only is WBV training safe, well tolerated by MS patients but it also improved standing balance and walking speed in MS patients.

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Abbreviations

C	Celsius
cm	centimetres
CMAP	Compound muscle action potential
CNS	Central nervous system
CSA	Cross sectional area
EDSS	Expanded disability status scale
FP	Foot placement
Fri	Friday
FRT	Functional reach test
FS	Functional system
g	Gravity
HHV	Human herpes virus
HLA	Human leukocyte antigen
hrs	Hours
Hz	Hertz
Kg	Kilograms
Km	Kilometres
MHC	Major histocompatibility complex
m	metres
mm	millimetres
mmHg	millimetres of mercury
Mon	Monday
min	minutes

MS	Multiple Sclerosis
MU	Motor unit
mV	millivolt
MVC	Maximum voluntary contractile
PCr	Phosphocreatine
P_i	Inorganic phosphate
RPE	Rating of perceived exertion
RRMS	Relapsing remitting multiple sclerosis
SB	Standing balance
SD	Standard deviation
SF-36	Short form-36
TUG	Timed up and go
WBV	Whole Body Vibration
Wed	Wednesday
Wk	Week
y	Years