

Postural stability and lokomat therapy in patients with stroke and severe gait disorder

Eicher S¹, Dewor A¹, Schweinfurter R¹, Huster T¹,
Möller JC^{1,2}, Paredes LP¹, Zutter D¹

1 Rehaklinik Zihlschlacht, Switzerland
2 Philipps University Marburg, Germany

Introduction

Many stroke patients suffer from gait disorder and/or disturbances of balance. Lokomat therapy (LT) is an established therapy for gait rehabilitation after stroke. However, only little data are available with respect to LT and postural stability during stance. In daily practice we observed a better stance of some patients directly at the end of each LT session.

Purpose

The aim of this investigation was to measure the deviations from the center of gravity to assess the effect of LT on postural stability after stroke.

Methods

11 stroke patients with a severe gait disorder (Tab.1) were examined by measuring the deviations from the CG at the beginning and at the end of two out of the first three lokomat sessions. 6 patients were able to stand freely (non-pushers), while 5 patients featured the pusher syndrome (pushers). The non-pushers had 55±22 min and the pushers 48±23 min of LT (p=0.62). The deviations from the CG (cm), the radius of sway (cm) and area of movement (cm²) were measured with the MediBalance Pro Board (MediTECH, Germany).

Descriptives	
Stroke	11 (4 male)
Age	60 ± 15
Time from stroke onset	20–51 days
FAC (<i>median</i>)	≤ 1

Tab. 1: Patient characteristics

Results

Over all patients, there were no significant changes between the 1st and last measurement. However, the results differed between the 6 non-pushers and the 5 pushers. Non-pushers showed a decrease of the overall deviation from the CG by 27% (p=0.06), the mean radius of sway by 14% (p=0.28), the maximum radius of sway by 27% (p=0.03) and the area of movement by 52% (p=0.01). In both groups the horizontal deviation of CG and the horizontal maximum radius

of sway decreased, in non-pushers by 19% (p=0.45) and 12% (p=0.46), in pushers by 28% (p=0.1) and 27% (p=0.03). All other values in pushers increased.

Fig. 1 & 2: Moving distance of CoG before 1st and after 2nd Lokomat therapy

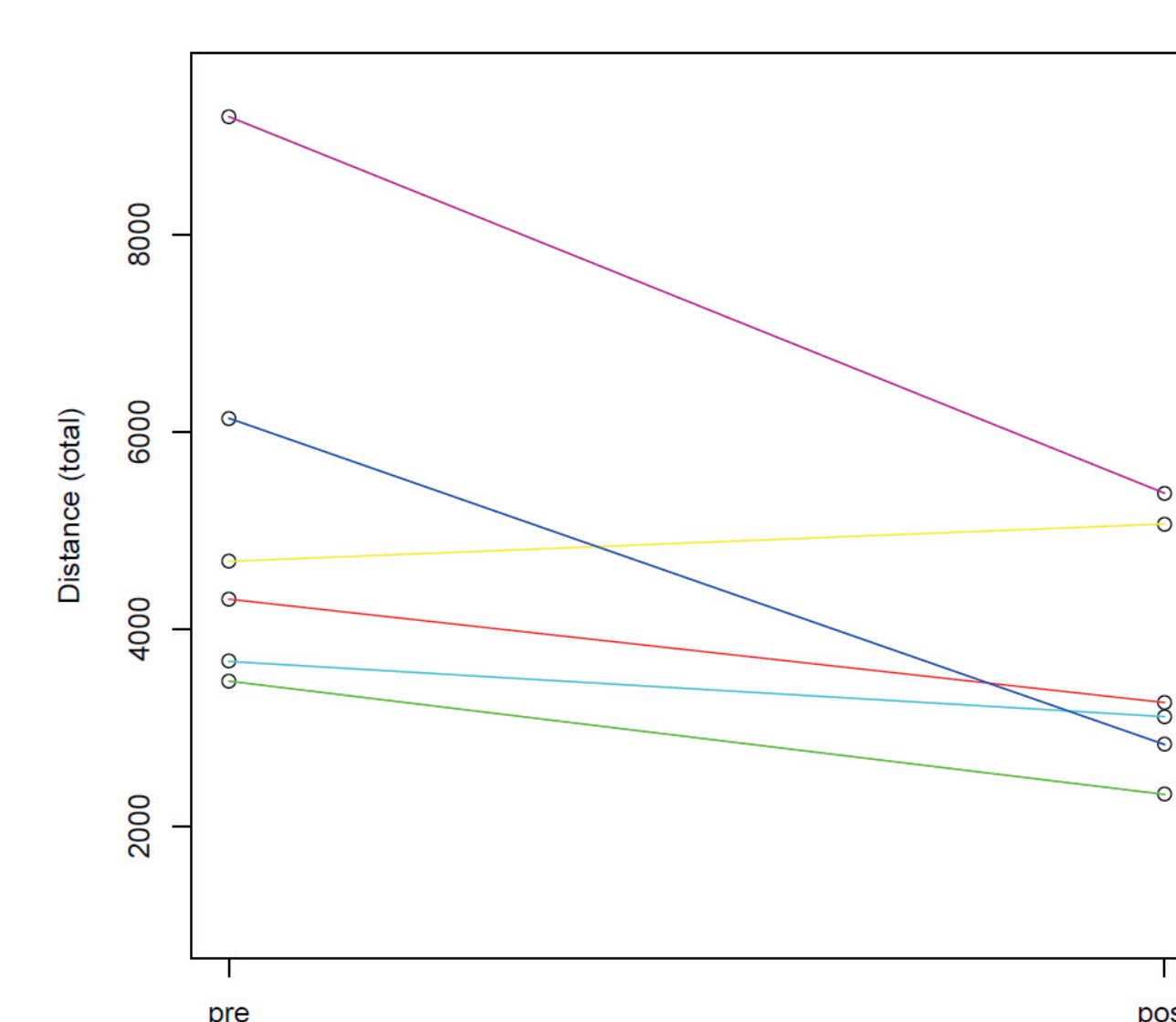


Fig. 1: Non-Pushers p=0.06 (n=6)

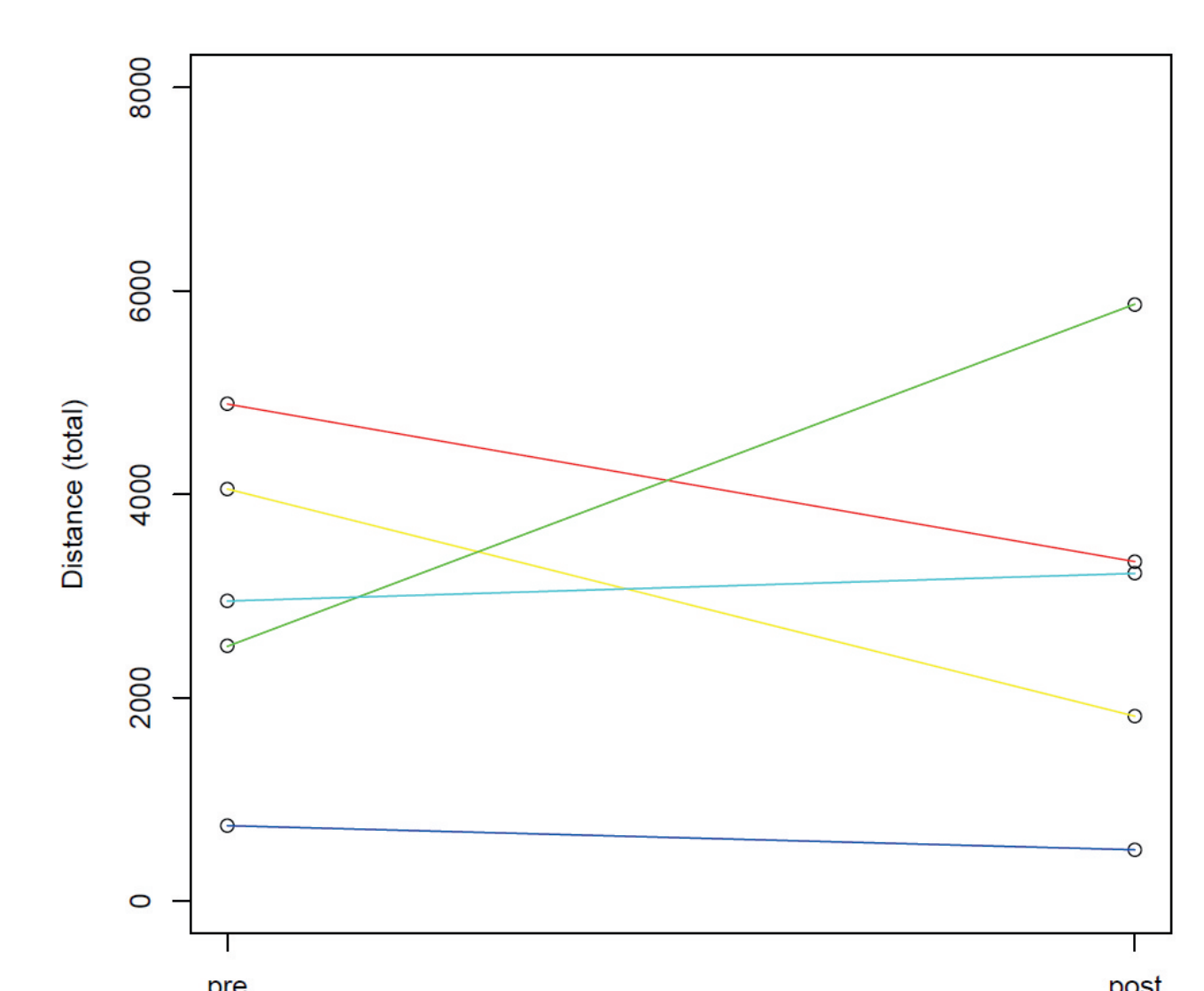


Fig. 2: Pushers p=0.94 (n=5)

Fig. 3 & 4: Radius of sway (CoG) before 1st and after 2nd Lokomat therapy

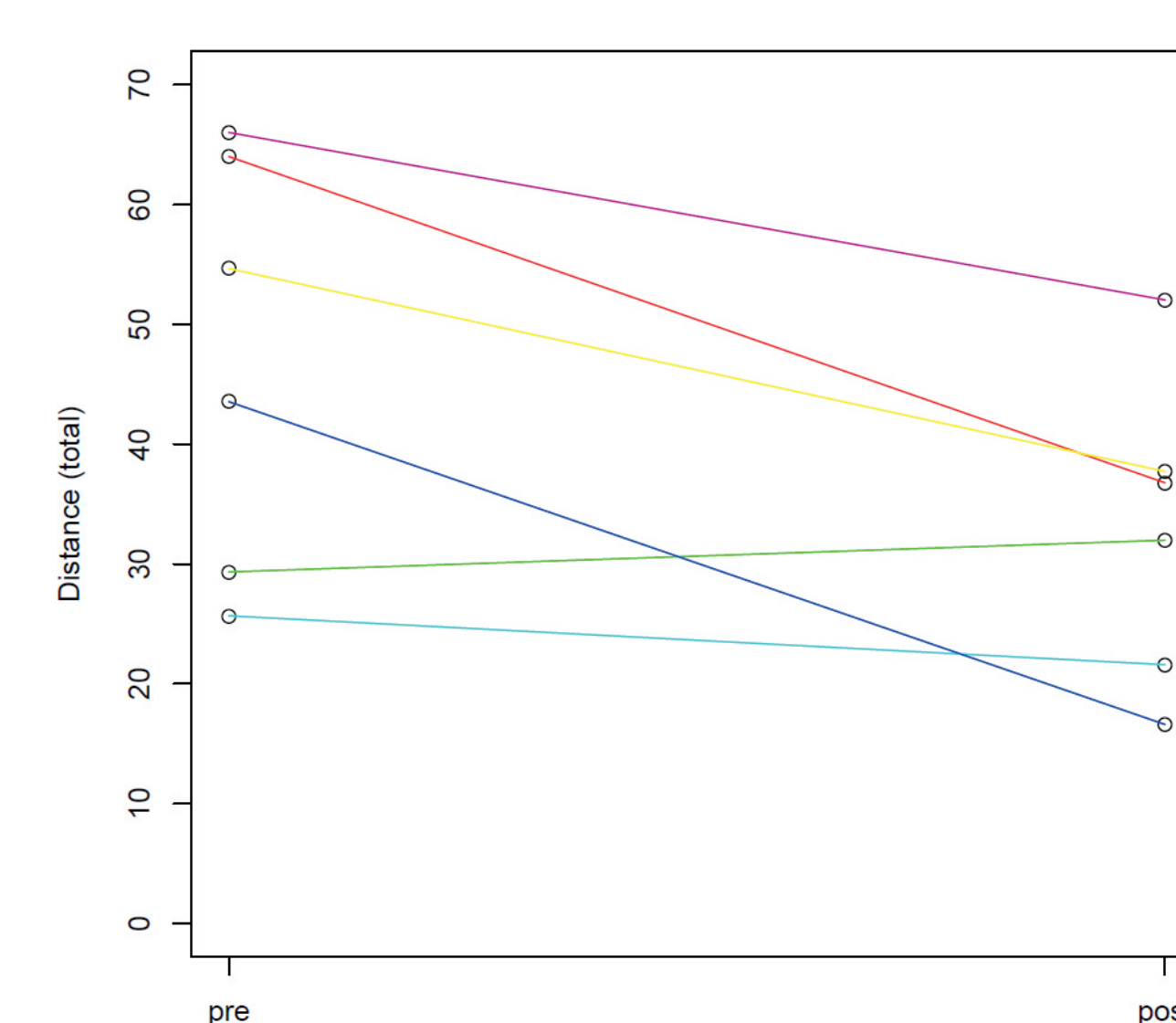


Fig. 3: Non-Pushers p=0.03 (n=6)

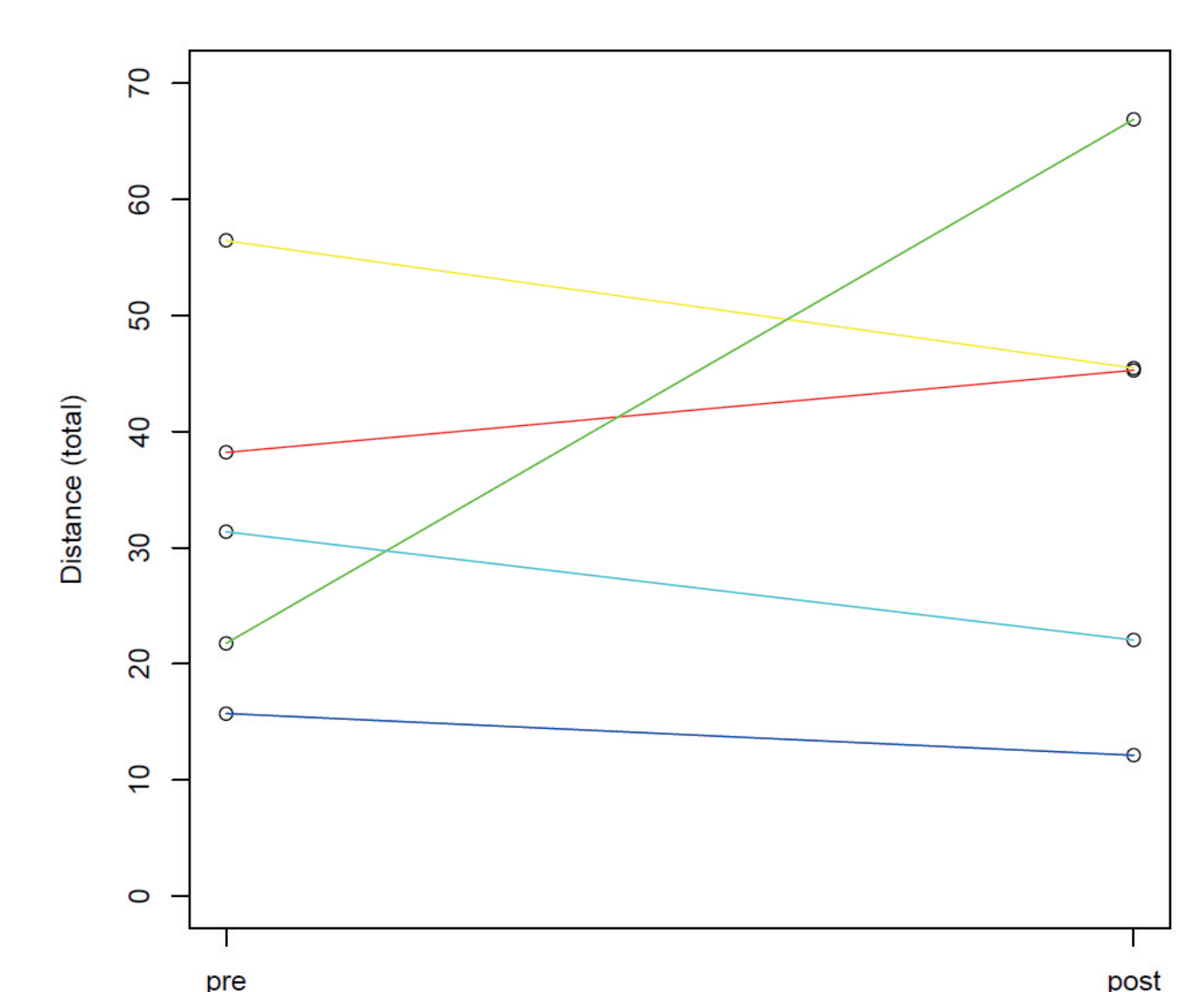


Fig. 4: Pushers p=0.61 (n=5)

Fig. 5 & 6: Position of CoG before 1st and after 2nd Lokomat therapy

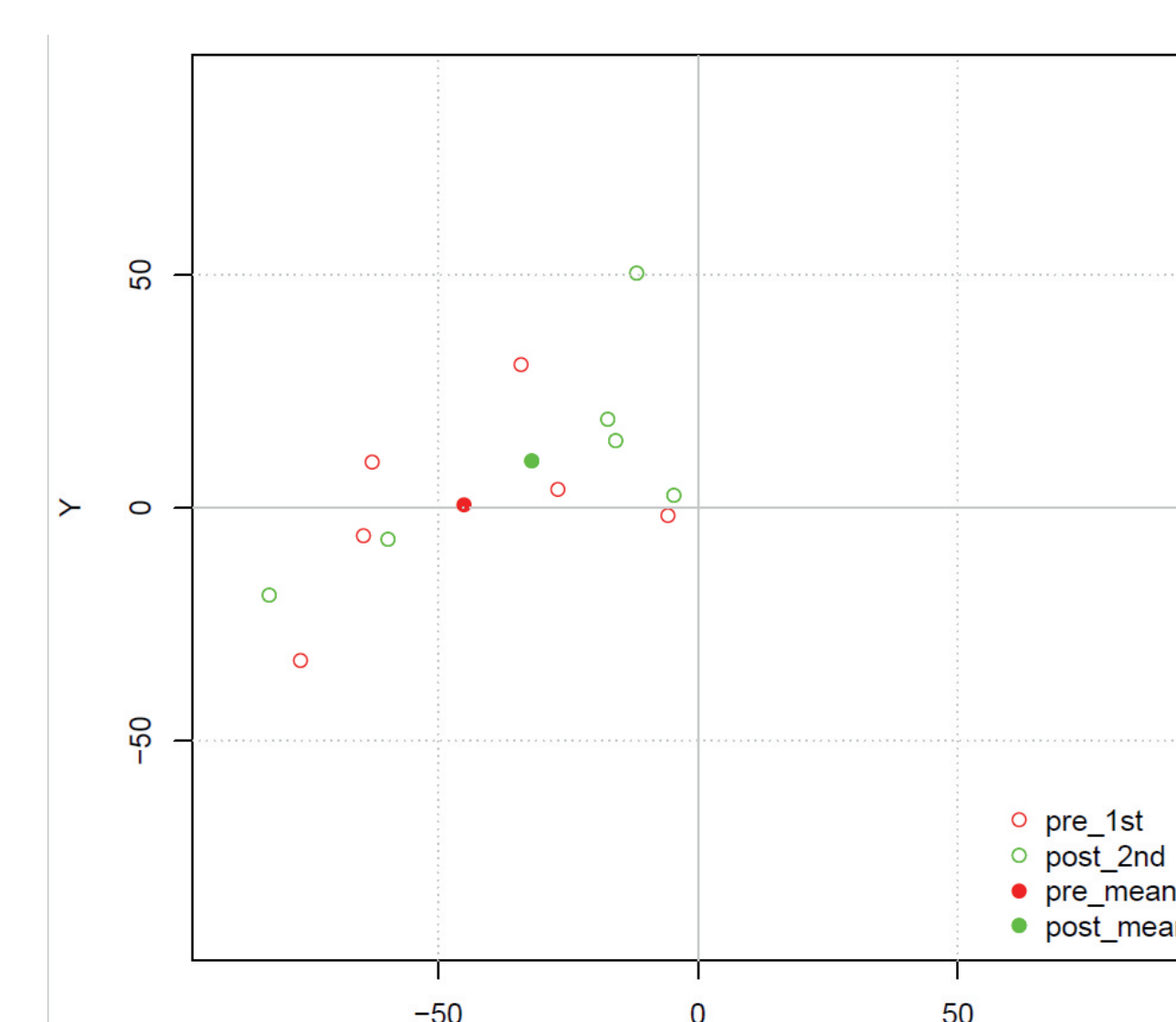


Fig. 5: Non-Pushers (n=6)

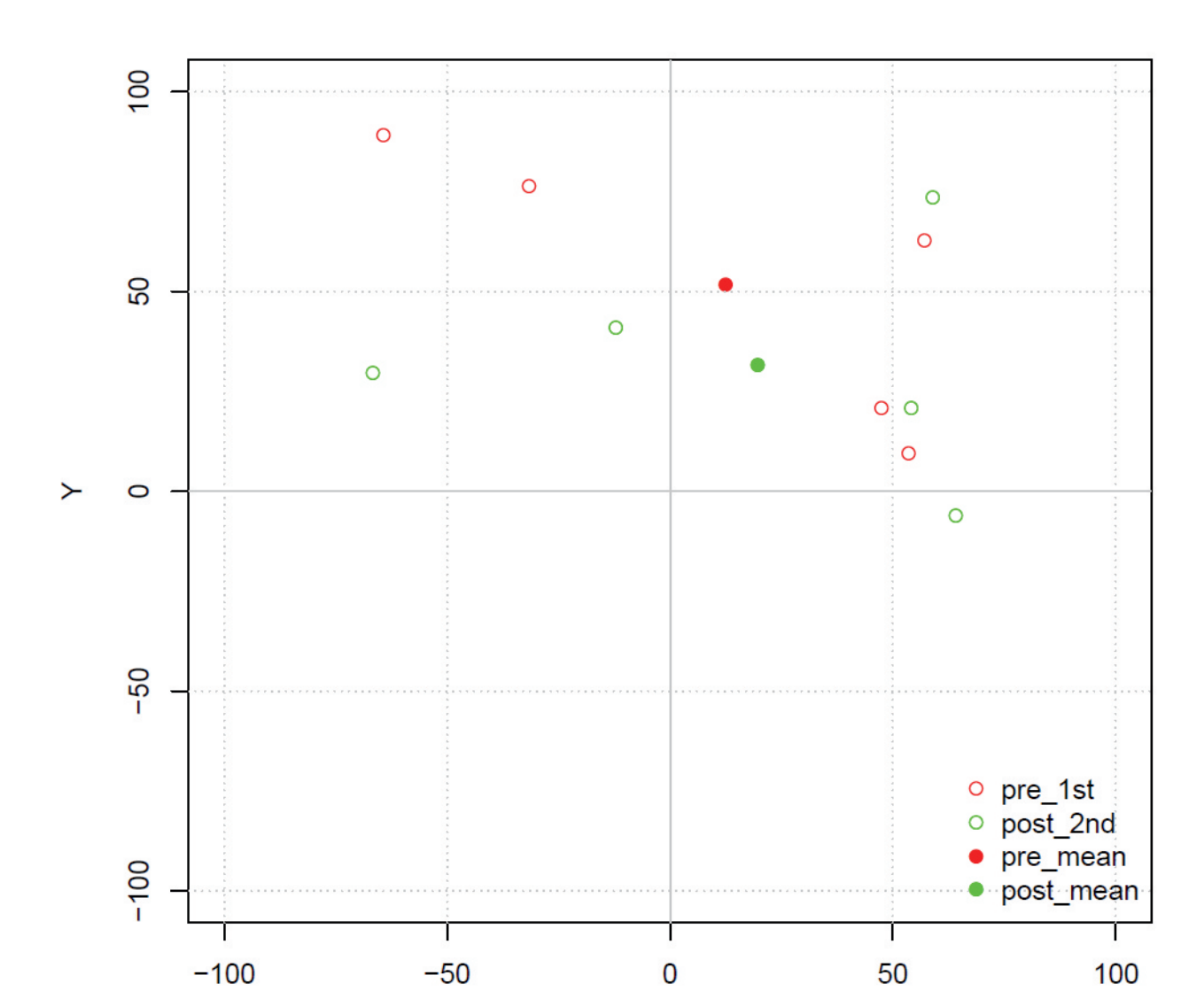


Fig. 6: Pushers (n=5)

Discussion & Conclusions

This pilot study indicates that stroke patients with a severe gait disorder may benefit from LT with respect to postural stability during stance. This, however, may rather be true for patients without a pusher syndrome. Future research should confirm these preliminary data and investigate whether the possible improvement of postural stability is due to a specific effect or rather due to an improved use of the paretic leg.

Correspondence Address

Simone Eicher
Center for Neurological Rehabilitation
Hauptstr. 2-4
CH-8588 Zihlschlacht
Switzerland.
Email: s.eicher@rehaklinik-zihlschlacht.ch