

Functional Strength Training and Pilates Based Training in Moderate Multiple Sclerosis

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BACKGROUND

A handful of studies have reported benefit of Pilates Training (PBT) in MS. Functional Strength Training (FST) focuses on muscle strengthening in movement and positions that the body recognizes as functional, in contrast to classical strength training which focuses on isolated muscles strengthening against resistance. FST is unexplored in MS. We completed a comparative pilot study in MS subjects exploring the overlapping and differing concepts between FST and PBT.

METHODS

- Ten MS subjects were recruited and randomized to an 8-week group class of either functional strength training (FST) or Pilates-based training (PBT).
- Classes were twice a week.
- Subjects were tested pre- and post- 8-week session by an examiner blinded to subject group (FST vs PBT).
- Testing included: Timed-up and Go (TUG), Berg Balance Test (BBT), Single Limb Stance Time (SLST), 30 second Sit to Stand (30SS), self-reported EDSS (SR_EDSS), MS Impact Scale (MSIS), MS Walking Scale (MSWS-12), Modified Fatigue Impact Scale (MFIS), and Health Status Questionnaire (SF-36)

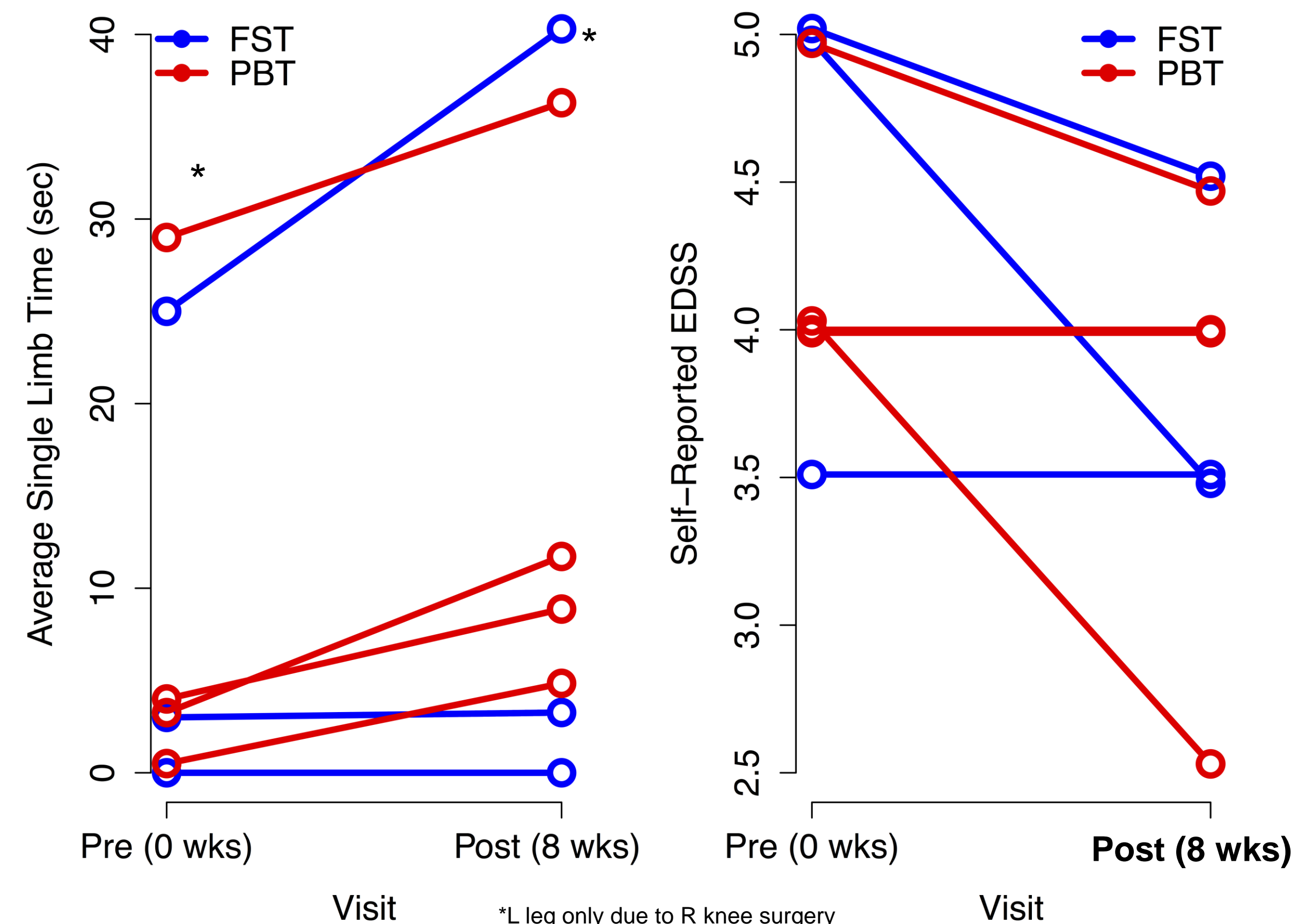


RESULTS

Table 1: Subject Demographics and Outcomes

Variable	Mean +/- SD		Median (IQR)	
	Pre	Post	Pre	Post
Age	54.6 +/- 8.3		55 (49.5 – 59)	
EDSS Step (SR)	4.4 +/- 0.6	3.8 +/- 0.7	4 (4 – 5)	4 (3.5 – 4.25)
MSIS Total	62.7 +/- 11.6	57.4 +/- 14.9	61 (53.5 – 73.5)	54 (45.5 – 72)
MFIS Total	41.3 +/- 13.8	42.0 +/- 15.9	39 (32 – 47.5)	47 (31.5 – 52)
6MW	1079.0 +/- 306.2	1078.0 +/- 273.8	954 (908 – 1282)	1051 (886 – 1312)
TUG	11.6 +/- 4.7	10.6 +/- 3.5	10.3 (8.8 – 13.8)	9.4 (8.4 – 11.7)
SF-36 Total	97.4 +/- 6.7	96.9 +/- 7.9	96 (93.5 – 102)	97 (94 – 99.5)
BBT	7.2 +/- 2.6	7.3 +/- 3.1	7 (5.25 – 9.5)	8 (6.25 – 9.75)
30SS	10.7 +/- 5.6	11.1 +/- 4.6	8 (8 – 13)	10 (9 – 13)

Abbreviations: EDSS = Expanded Disability Status Scale; SR = Self-Reported; MSIS = Multiple Sclerosis Impact Scale; MFIS = Modified Fatigue Impact Scale; 6MW = Six-Minute Walk; TUG = Timed Up and Go; SF-36 = Health Status Questionnaire; BBT = Berg Balance Test; 30SS = 30-second Sit to Stand



RESULTS

Ten subjects agreed to join the study but 3 dropped out prior to completing the first week of classes, resulting in 7 subjects' data available for analysis with 3-FST and 4-PBT completers. One FST subject had secondary-progressive MS and the other 6 had relapsing-remitting MS. With these small numbers, results were not statistically significant, but several trends demonstrated benefit for both FST and PBT.

- Single-limb stance time was substantially improved in the PBT group with mean improvement of almost 6 seconds (pre- vs. post: R-leg mean (sd): 6.3 (11.7) vs. 15.4 (23.8) & L-leg: 8.9 (11.2) vs. 11.7 (12.4)).
- The FST and the PBT group had improvement in the mean SR_EDSS. FST group (pre- mean = 4.5 vs. post = 3.8). PBT group (pre-mean = 4.25 vs. post = 3.75).
- Five out of seven subjects had improvement in MSIS scores pre- vs. post- training. All subjects: mean(sd), was 62.7 (11.6) vs 57.4 (14.9); median 61 vs 54, respectively.

DISCUSSION

This small pilot study confirms the feasibility of FST and PBT in moderately disabled MS subjects. Improvements were seen in both objective and subjective measures for PBT and subjective measures for FST. Though the Borg Scale of perceived exertion was introduced to the FST group to encourage exercise at the “somewhat hard” level, it is possible that this was not sufficient intensity to impact functional outcome measures. Future studies will explore these findings in larger and longer studies.