Examination of the lateral bending of the trunk in Parkinson's disease

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Received 25 February 2013; received in received from 7 March 2013; accepted 14 March 2013

Abstract

In Parkinson's disease (PD), the frequency of the lateral fold posture was examined. The relationship with lateral fold posture and the previous retroversion posture and with lateral fold posture and the center of gravity shift were examined. The subjects were 45 hospitalized PD patients (13 men and women 32). The center of gravity was biased towards the other side of the spinal column convex side. The pelvic lateroversion angle correlated with the trunkal lateral fold angle. The retroversion before trunk did not correlate with the lateral fold or pelvic lateroversion. This suggests the different condition of a patient of both.

Keywords: lipofuscin, Parkinson's disease, mitochondria

Introduction

The degree of leaning of the axon towards a flank, which develops in Parkinson's disease, (PD) is called the Pisa syndrome [1]. This is known as frequently occurring abnormal posture, similar to bent spine symptom [2]. However, it is not known what kind of condition of a patient a trunkal lateral fold develops with. Also, the association with camptocormia is not understood. In this study, we paid attention to the lateral fold attitude that occurs in PD. The relationship with the frequency of the lateral fold posture and the anteflexion posture was examined. Also, the lateral fold posture and the relationship with the center of gravity shift were examined.

Materials and methods

The subjects were 45 PD patients (13 men, women 32) who had been hospitalized from 2009 to 2012. The age range was 56 to 85 years old (average age, 70.8 years old). The disease period was two through 11 years. The disease severity classification of Hoehn and Yahr was Stage 3 to 4. The measurement of the center of gravity position. The center of gravity position at the standing position of the PD patients was measured using a center of gravity unrest meter. The measurement of the center of gravity position was conducted on the bare foot for 30 seconds (Figures 1a and 1b). The measurement of retroversion angle in front of the trunk, lateral fold angle and the pelvic flank angle of inclination. The pelvic projecting side at the standstill standing position was assumed to be the spinal column convex side. The pelvic flank

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angle of inclination was measured from a Jacaby line and the angle of the horizon from a coronal plane. The trunkal lateral fold corner was measured from the perpendicular line from a Jacoby line and the angle of the spinal column midline. The trunkal previous retroversion corner was measured from the angle of a perpendicular line and the camptospasm line from the floor (Figures 2a and 2b).

Results

We examined the relationship of scoliosis and the center of gravity shift (right and left) of the spinal column. The patients with the left center of gravity were 14 of 15 people with the right convex. The patients with the right center of gravity were 22 of 30 people with the left convex. The center of gravity tended to be biased towards the other side of the spinal column convex side ($P < 0.000$).
The relationship of camptospasm, the lateral fold and the pelvic lateroversion were also examined. Is significant in a spinal column lateral fold and pelvic lateroversion; was correlative. The other correlations that were apparent to two were not found (Figures 3a - c).

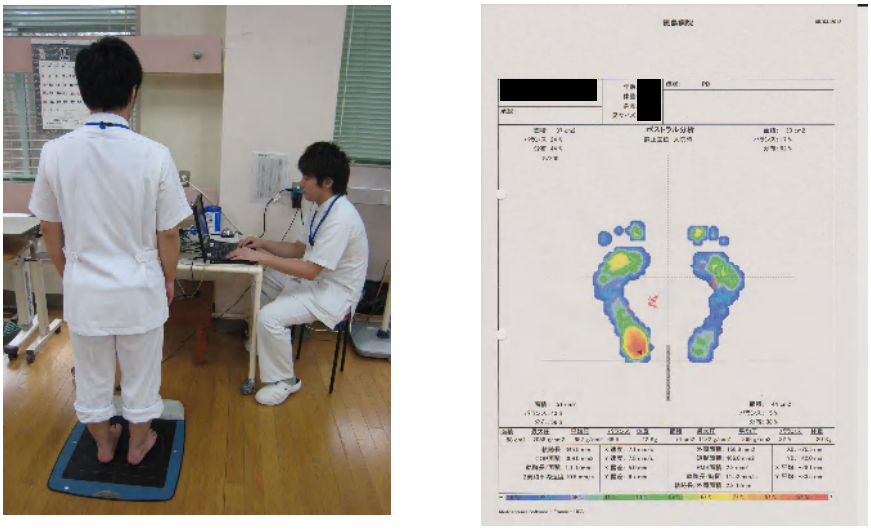
Discussion

The spinal column convex side patients showed a center of gravity biased towards the other side. The pelvic lateroversion angle correlated with the trunkal lateral fold angle. The camptospasm did not correlate with the lateral fold or pelvic lateroversion. It is thought that both appeared from the different condition of a patient. The spinal column scoliosis of PD seems to be abnormal posture independent of anteflexion. Inclination of the pelvis and a center of gravity position may be prescribed by spinal column scoliosis.

References

1. Doherty KM, van de Warrenburg BP, Peralta MC, Silveira-Moriyama L, Azulay JP, Gershanik OS, Bloem BR. Postural deformities in Parkinson's disease. Lancet Neurol. 2011; 10: 538-549.

2. Lees AJ, Hardy J, Revesz T. Parkinson's disease. Lancet. 2009; 373:2055-2066.



a b

Figure 1.The measurement of the center of gravity position

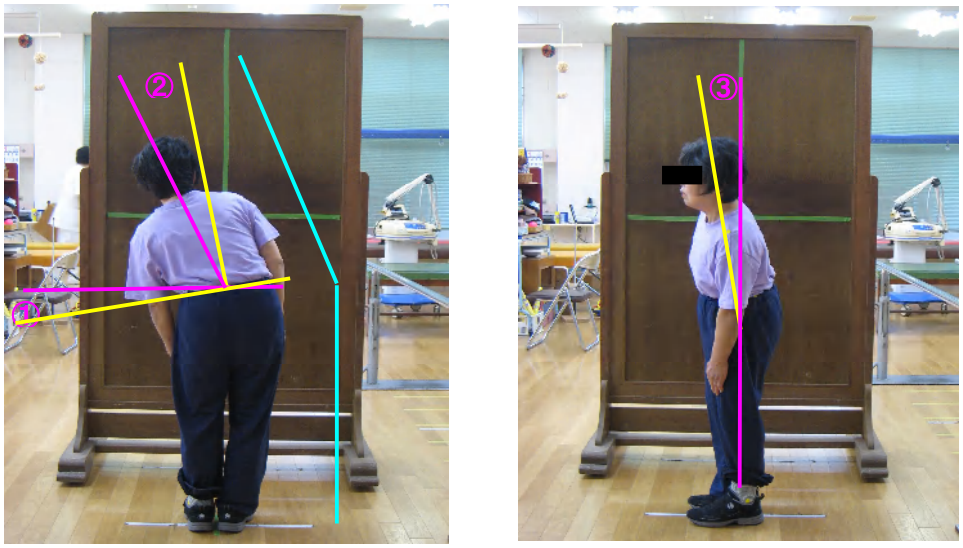


Figure 2. ①The pelvic lateroversion angle ② The lateral fold angle ③ The camptospasm angle.

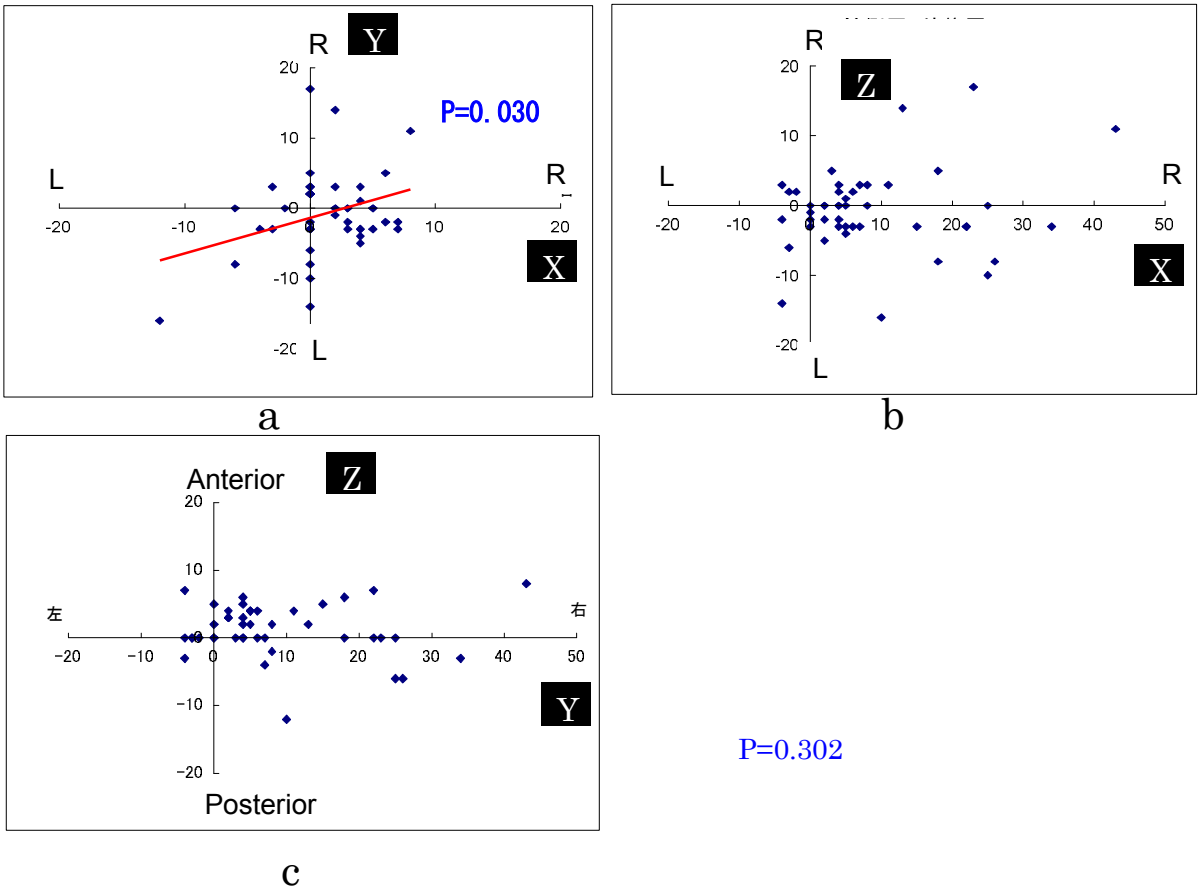


Figure 3. Relationship of retroversion before the trunk, the lateral fold and the pelvic lateroversion a, significant correlation was found in the spinal column lateral fold (X) and pelvic lateroversion (Y). b, A significant correlation was not found in the spinal column lateral fold or anteflexion (Z). c, A significant correlation was not found in spinal column anteflexion (Z) or pelvic lateroversion (Y).