

Effects of Anti-Parkinsonian Medications on Forward and Backward Gait Patterns in Persons with Parkinson's Disease (PD)

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Background

Persons with PD have impairments in both forward and backward walking. Backward walking is important in activities of daily living. Anti-parkinsonian medications alleviate several PD symptoms including tremor, bradykinesia, and functional mobility. We found no information on responses of the medications on forward & backward gait patterns in individuals with PD.

Purpose

To characterize the influence of anti-parkinsonian medications on forward and backward walking patterns in persons with PD.

Procedures

Twenty-two subjects with PD were recruited. Four subjects were unable to walk backwards without dragging their feet , so data from 18 subjects (15 males & 3 females) were used in the analysis. Subjects came to the lab without taking the morning medication dose. After completing the walk tests, subjects took their medications and waited approximately 45 min. to 1 hour for medications to take effect.

Results

Walk Tests

Subjects were instructed to walk forward at their self-selected speed on a computerized, instrumented mat (GAITRite, CIR Systems INC, Havertown, PA.) while "off" medications. The walk was repeated and the average of the 2 walks was used for data analysis . The subject then walked backwards on the mat at a self-selected speed while "off" medications. The backward walk was repeated , and the data averaged. Both forward and backward trials were repeated when medications took effect. Subjects were guarded while walking to prevent falls.

Subject Characteristics (n=18)	Mean	SD
Age (yr)	71.5	8.87
BMI (kg/m ²)	26.26	4.01
Disease Duration (yr)	9.06	6.13
H&Y (on)	2.75	0.31
UPDRS III 'off'	33.28	8.09
UPDRS III 'on'	22.94	6.36

Measures	Forward Walk			Backward Walk		
	OFF	ON	P	OFF	ON	P
Gait Speed (cm/s)	82.22±26.58*	92.13 ± 20.41*	0.024	39.68±18.89*	51.61 ± 21.85*	0.003
Cadence (steps/min)	129.12 ± 36.89	116.75 ± 24.46	0.061	119.63 ± 35.25	119.83 ± 22.40	0.98
Stride Length (cm)	80.55±24.95*	98.23 ± 18.81*	0.000	42.36 ± 21.88*	52.67 ± 21.37*	0.013
Double Support (%GC)	30.00 ± 15.12	25.22 ± 10.77	0.177	27.85 ± 16.40	20.16 ± 8.11	0.051

Conclusion

Anti-parkinsonian medications improved gait speed and stride length when persons with PD walked either forward or backward, but had no effect on the cadence and the double support time.

References

Hackney ME, Earhardt GM. Backward walking in Parkinson's disease. Mov Disord. 2008 Oct. 24;24(2):218-223