

Background

Parkinson disease (PD) has been associated with both weight loss and weight gain in different stages of the disease [1]. Most previous studies have focused on weight loss rather than gain in PD. Weight loss has been attributed to reduced food intake due to hyposmia and loss of taste, gastrointestinal (GI) dysfunction (dysphagia, constipation), decreased hypothalamic orexin, disability, and changes in energy metabolism related to tremor, rigidity or dyskinesia [1].

Objectives

Primary aims

- 1) To examine the prevalence of weight change over two years across the range of PD progression based on thresholds of 3% and 5% weight change
- 2) To determine the association between the baseline characteristics and weight change over time

Secondary aim

- 1) To investigate how weight change, either loss or gain, impacts PD outcomes

Methods

This was a retrospective cross-sectional and longitudinal analysis of data collected between April 2002 and February 2018 as part of the Health Outcomes Measurement (HOME) Study at the University of Maryland Parkinson Disease and Movement Disorders Center. Weight at baseline and follow-up was used to classify patients into groups of weight loss, stable, and weight gain. Differences between these groups at baseline and then with change over time were tested.

Clinical characteristics: PD duration and severity (UPDRS and HY), BSI Depression, and cognition (MMSE). For primary aim, means of continuous variables were compared using ANOVA. For secondary aim, Multivariable Generalized Linear Models (GLM) was used.

Results

The sample was 668 patients, age 66.1(10) and disease duration 5.3(5.4) yrs.

Age was associated with both 3% and 5% change in weight. 5% weight change was associated with disease duration, UPDRS, and HY. Effects of 3% weight loss on Motor UPDRS, and depression remained significant when controlling for baseline differences in age, levodopa use, and Total UPDRS.

Table 1: Weight Change Over Time by Demographics and Clinical Features

	3% Weight Change Over 2 Years			5% Weight Change Over 2 Years			
	Overall N = 668	3% Weight Loss 218 (32.6%)	Weight Stable 296 (44.3%)	3% Weight Gain 154 (23.1%)	5% Weight Loss 151 (22.6%)	Weight Stable 412 (61.7%)	5% Weight Gain 105 (15.7%)
Age, [yrs; mean(SD)]	66.1 (10.0)	68.1 (9.3)	66.7 (10.1)	62.3 (9.9)	70.5(9.8)	67.2 (9.7)	65.1 (10.8)
PD Duration, [yrs; mean(SD)]	5.3 (5.4)	5.8 (5.8)	5.2 (5.3)	4.6 (5.1)	6.2 (5.8)	5.1 (5.3)	4.6 (5.4)
Total UPDRS, [mean(SD)]	38.0 (17.8)	39.5 (18.0)	36.5 (17.4)	38.2 (17.9)	41.4 (18.2)	36.5 (17.7)	38.4 (16.5)
Motor UPDRS, [mean(SD)]	25.7 (12.1)	26.8 (12.1)	24.4 (11.8)	26.5 (12.4)	27.8 (12.2)	24.6 (12.1)	26.7 (11.7)
BSI Depression, [mean(SD)]	49.9 (9.2)	49.8 (8.9)	48.8 (9.1)	51.7 (9.4)	50.3 (9.8)	49.3(8.9)	51.1 (9.3)
Total MMSE score, [mean(SD)]	28.6 (2.1)	28.5 (1.9)	28.6 (2.4)	28.7 (1.6)	28.2 (2.1)	28.7 (2.2)	28.7 (2.2)
HY < 3	407 (79.2)	123 (31.0)	186 (45.7)	95 (23.3)	86 (21.1)	260 (63.9)	61 (14.9)
HY ≥ 3	107 (20.8)	45 (42.1)	38 (35.5)	24 (22.4)	34 (31.8)	52 (48.6)	21 (19.6)
Levodopa Use, n(%)	329 (49.2)	109 (33.1)	158 (48.0)	62 (18.5)	78 (23.7)	210 (63.8)	41 (12.5)

Red: Overall P-value <.05 for 3% weight change; Blue: Overall P-value <.05 for 5% weight change

Conclusion

Greater PD severity and disability were associated with weight loss over a two-year period. Both a 3% and 5% weight loss were associated with age. Only 5% weight change was associated with disease severity and duration of the disease at baseline. Both weight gain and weight loss are seen in the setting of PD.

References

1. Kistner A, Lhommée E, Krack P. Mechanisms of body weight fluctuations in Parkinson's disease. *Front Neurol.* 2014;5:84. Published 2014 Jun 2.
2. Ghourchian, S., Gruber-Baldini, A. L., Shakya, S., Herndon, J., Reich, S. G., von Coelln, R., Savitt, J. M., & Shulman, L. M. (2021). Weight loss and weight gain in Parkinson disease. *Parkinsonism & related disorders*, 83, 31–36.

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