A History of Traumatic Brain Injury Exacerbates Poor Quality of Life in Parkinson's Disease

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INTRODUCTION

- Parkinson's disease (PD) is a neurodegenerative disease characterized by motor and non-motor symptoms as well as poor quality of life (QoL).
- Individuals with mild-moderate traumatic brain injury (mmTBI) also report significantly poorer QoL compared to individuals without a history of TBI.
- While decreased QoL is evident in independent samples of PD *or* mmTBI, the impact of a mmTBI history on QoL in individuals with PD is not known.
- Therefore, the objective of this study was to investigate the impact of mmTBI on overall QoL in individuals with PD; such knowledge has important clinical implications.

PARTICIPANTS

- 25 non-demented PD patients with a history of mild-moderate TBI (PD+TBI) with loss of consciousness (LOC) and 30 demographically-matched PD patients without a history of TBI (PD-TBI).
- Global cognition was screened using the MDRS; scores ≥124 were considered non-demented.
- There was no significant difference between groups in disease duration, depression, global cognition, or Levodopa Equivalence Dosage (LED).

Table 1. Demographic and Clinical Characteristics of Study Participants

	PD+TBI (*n* = 25)	PD-TBI (*n* = 30)	*p*
Age (years)	67.72 (± 8.0)	67.07 (± 9.6)	.69
Education (years)	15.99 (± 2.4)	16.7 (± 2.2)	.85
Gender	Males: 80% Females: 20%	Males: 66.7% Females: 33.3%	
Disease Duration (years)	6.12 (± 4.7)	4.44 (± 4.3)	.26
Hoehn & Yahr Stage* 0 / 1 / 1.5 / 2 / 2.5 / 3 / 4 / 5	0 / 11.3 / 1.9 / 18.9 / 3.8 / 9.4 / 0 / 0	3.8 / 18.9 / 0 / 22.6 / 5.7 / 3.8 / 0 / 0	.25
UPDRS-Part III score	22.71 (± 12.6)	16.50 (± 12.1)	.76
Levodopa Equivalent Dosage (mg/day)	744.50 (± 593.2)	752 (± 861.5)	.93
Geriatric Depression Scale	6.92 (± 5.6)	6.37 (± 4.9)	.40
Mattis Dementia Rating Scale total	137.80 (± 4.5)	139.03 (± 4.1)	.82
TBI Severity* Mild : Moderate : Mild-Moderate	76% : 16% : 8%	—	—
Years from TBI to PD Diagnosis	33.24 (±17.4)	—	—
Years from TBI to Date Tested	38.47 (±19.2)	—	—
Post Traumatic Amnesia Yes : No: Unsure	76% : 20% : 4%	—	—

Note: Hoehn & Yahr n=53. UPDRS-Part III n=54. TBI Durations n=23. The Unified Parkinson's disease Rating Scale (UPDRS) was administered by a senior staff neurologist specializing in movement disorders. LED (mg/day) were calculated using the criteria of Tomlinson et al. (2010). TBI was assessed using semi-structured interviews. All subjects, except 1, sustained TBI prior to PD diagnosis (n=24). *Percentage of participants in each H&Y Stage.

METHODS

Measures

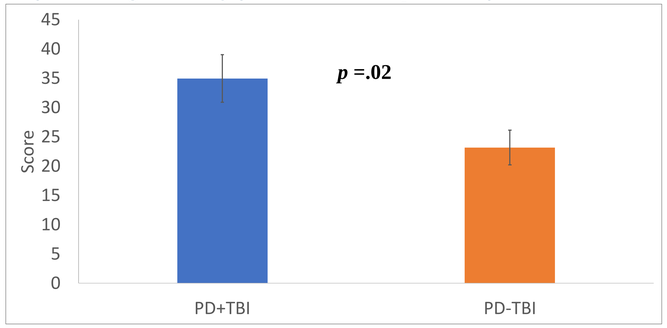
- Participants were administered the Parkinson's Disease Questionnaire (PDQ-39), a self-report questionnaire assessing PD-specific QoL.
- The PDQ-39 includes a total score and eight subscales (each with a range of 0-100): mobility, activities of daily living, stigma, social support, emotional well being, cognition, communication, and bodily discomfort; higher scores = worse QoL.
- Subscale scores were calculated by summing each item in the dimension and dividing by the max possible score of all items in the dimension, multiplied by 100.

Statistical Analysis

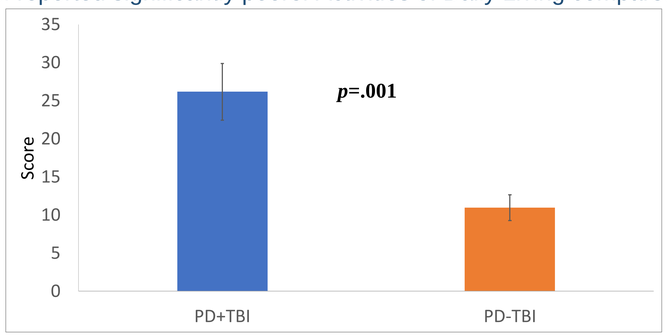
- A two group (PD+TBI v. PD-TBI) one-way analysis of variance was conducted to explore the differences in QoL (PDQ-39 total and subscale scores). Welch's test for Equality of Means results were reported for those tests that violated

RESULTS

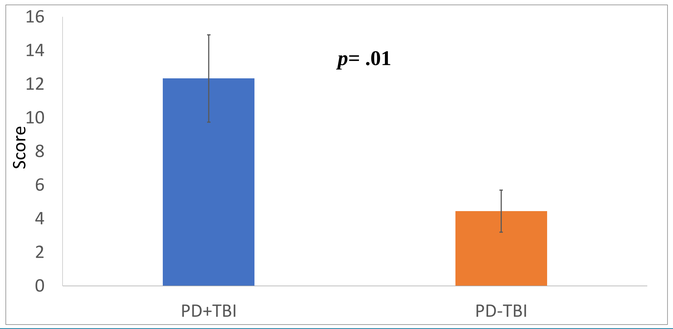
- PD+TBI reported significantly poorer overall QoL compared to PD-TBI



- PD+TBI reported significantly poorer Activities of Daily Living compared to PD-TBI

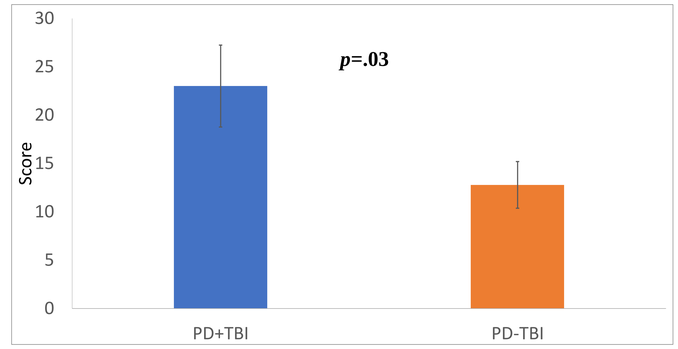


- PD+TBI reported significantly poorer Social Support compared to PD-TBI



RESULTS

- PD+TBI reported significantly poorer Communication compared to PD-TBI



- There was a trend (*p*=.088) for PD+TBI to report significantly worse emotional well being compared to PD-TBI.

SUMMARY

- Results indicate that a history of mmTBI lends to poorer quality of life in individuals with PD compared to PD patients without a history of mmTBI, despite groups being equivalent in disease characteristics.
- Specifically, those with PD+TBI endorsed significantly worse social support, communication, functioning in daily living activities, as well as a trend towards worse emotional well being compared to PD

CONCLUSION

- As hypothesized, the additive impact of traumatic brain injury results in worse QoL in PD, yet this impact appears only specific to social support, activities of daily living, and communication, and possibly emotional well-being.
- Previous research suggests that non-physical aspects of QoL, specifically social and adaptive functioning, communication skills, emotional and behavioral adjustments, psychological distress, as well as long-term difficulties with social/personal relationships are impacted in mmTBI, which could explain our current findings.
- The current study suggests that it may be valuable to incorporate TBI history assessment in the care of PD patients to better ascertain their well-being.
- These results have important clinical implications, including improving treatment protocols for PD. For example, treatment plans could focus on social support, communication, and daily living activities to improve QoL in PD patients with a history of mmTBI.
- Future studies would benefit from exploring cause-and-effect between mmTBI and QoL in PD. For example, studies may further look at the impact of mmTBI on QoL in PD over time.

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