Full indirect effect of hip fractures on the association between osteoporosis and mortality in Parkinson's disease

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Background and Objective: While the role of hip fractures and osteoporosis in contributing to mortality among patients with Parkinson's disease (PD) has been recognized, the specific mediation effect of hip fractures on the association between osteoporosis and mortality in this patient group remains insufficiently explored. This study aims to investigate the mediating role of hip fractures in examining the pathways and associated factors linking osteoporosis to mortality in patients with PD.

Methods: A retrospective cohort study was conducted using Korean national claims databases. The study data were obtained from the 2009~2019 Korean National Health Insurance Service (NHIS) databases. Individuals with PD diagnosis were identified using both the ICD-10 code (G20) and a PD registration code (V124) from the NHIS databases. Path analyses were utilized to estimate the mediating effect of hip fracture between osteoporosis and mortality in patients with PD diagnosis.

Results: Among the 2,084 patients with PD, 576 (27.6%) patients experienced osteoporosis, and 111 (5.3%) patients experienced hip fractures after the diagnosis of PD. In unadjusted mediation analysis, the direct effect of osteoporosis on mortality in PD was not statistically significant (β = 0.0075, p = .7566); however, the indirect effect mediated by hip fracture was statistically significant (β = 0.0151, p = .0006). Similarly, in the adjusted model controlling for sex, age at PD diagnosis, and Charlson comorbidity index, the direct effect was not statistically significant (β = -0.0285, p =.2956); while the indirect effect was statistically significant (β = 0.0083, p = .0117).

Conclusions: The study findings reveal a full mediating effect of hip fractures on the association between osteoporosis and mortality in PD patients. Furthermore, the study suggests the critical importance of considering pathological factors such as osteoporosis in the prevention of hip fractures in PD patients.