COMMENT ON DAVIS ET AL.

Development and Validation of a Simple Hip Fracture Risk Prediction Tool for Type 2 Diabetes: The Fremantle Diabetes Study Phase I. Diabetes Care 2018;42:102–109

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In the article by Davis et al. (1), regarding risk factors for hip fracture in people with type 2 diabetes, we note the absence of two risk factors that were not considered and that are relatively easy to assess. The first is cognitive impairment. Approximately 40% of participants with hip fractures have cognitive impairment (2), including ~20% with dementia. The second factor is an elevated albumin-to-creatinine ratio (ACR)—a manifestation of small vessel disease—which is associated with cognitive impairment and with hip fracture risk (3,4). Both cognitive impairment and microvascular disease are common in people with diabetes.

The association of cognitive impairment and microvascular disease may be understood in two complimentary ways. One is that cognitive impairment leads to falls and fractures; the other is that hip fractures and cognitive impairment are related to one another through common antecedents. We examined the latter possibility in the Cardiovascular Health Study (CHS) (5), a longitudinal observational study of people ≥65 years of age. We reasoned that if microvascular diseases of the kidneys, brain, or eyes were in the causal pathway for hip fracture in people with cognitive impairment, adjusting for these disorders would attenuate the association of the cognitive disorder with hip fracture risk. In our cohort of 3,106 participants (mean age ~79 years; mean follow up 8.8 years), there were 488 (16%) with mild cognitive impairment (MCI) and 564 (18%) with dementia. Approximately 20% with either cognitive impairment had type 2 diabetes (compared with 13% without cognitive impairment). There were 337 incident hip fractures, of which 19% were in those with MCI and 26% with dementia. Adjusted hazard ratios for hip fractures were 2.45 (95% CI 1.67–3.61) in participants with MCI and 2.35 (1.57–3.52) for those with dementia. With doubling of the ACR, the hazard ratio for hip fractures was attenuated in participants with dementia compared with participants with normal cognition. Other microvascular illnesses, e.g., lacunar infarcts, brain white matter disease, albuminuria (≥30 mg/g creatinine; a binary variable), and retinal vascular disease, did not modify the association of dementia with hip fracture risk. Based on these findings, we concluded that higher ACR attenuates the risk of hip fracture with dementia through shared factors. Given the high prevalence of cognitive impairment and elevated ACR in older adults with type 2 diabetes and the ease of assessing these factors, our findings have relevance to the risk models proposed by Davis et al. (1) for predicting hip fractures in people with type 2 diabetes.

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