

PARKINSON DISEASE

Reduced level of dietary vitamin D is associated with PD

Plasma levels of both dietary and sunlight-derived vitamin D are inversely correlated with the risk of Parkinson disease (PD), according to a new study published in *Movement Disorders*. The finding suggests that low vitamin D levels in PD are not simply a result of reduced mobility.

Several previous studies have shown an association between PD and plasma levels of vitamin D, but the causal relationship has remained unclear. “It is debatable whether lower vitamin D levels are a contributing factor in the development of PD, or a consequence of reduced sunlight exposure,” explains Liyong Wang, lead author of the study.

The previous studies measured total plasma levels of vitamin D, but did not distinguish between its two distinct circulating forms: vitamin D2 and vitamin D3. Whereas levels of vitamin D3 depend largely on exposure to sunlight, vitamin D2 can only be obtained through the diet and supplements. For Wang and colleagues, this difference offered a way to gain insight into the relationship between vitamin D and PD.

“Because vitamin D2 level is independent of sunlight exposure, an inverse relationship between vitamin D2 and PD would suggest that lower vitamin D concentrations are not simply the result of reduced mobility in PD patients,” comments Wang.

The researchers measured vitamin D levels in plasma samples from a previous genome-wide analysis study of PD. The cohort included 478 patients with PD and 431 controls without PD. Whereas previous studies of vitamin D levels in PD had used immunoassay-based techniques that could only measure total vitamin D levels, Wang and colleagues used liquid

chromatography–tandem mass spectrometry to also quantify the levels of the two forms of the vitamin separately.

Both deficiency (<20 ng/ml) and insufficiency (<30 ng/ml) of total vitamin D were associated with an increased risk of PD, confirming previous findings. However, in addition, levels of vitamin D2 and vitamin D3 were each inversely associated with the risk of PD in a dose-dependent manner.

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“Our data demonstrate for the first time an inverse relationship of vitamin D2 concentration with PD,” says Wang. “This finding suggests that the inverse association between vitamin D levels and PD is not simply due to lack of sunlight exposure in PD patients with impaired mobility.”

Nevertheless, the new study does not settle the debate of cause and effect, as it does not show that low vitamin D levels precede development of PD. The authors note that gastrointestinal dysfunction, a frequent nonmotor symptom of PD, could impair vitamin absorption and account for the observations.

“Longitudinal studies to confirm the inverse association of vitamin D2 and PD are desired,” says senior study investigator William Scott, “but if confirmed, the association could support additional clinical studies of vitamin D supplementation in treatment or prevention of PD.”

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Original article Wang, L. *et al.* Vitamin D from different sources is inversely associated with Parkinson disease. *Mov. Disord.* doi: 10.1002/mds.26117