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## **Leg restlessness and hyperparathyroidism in Parkinson's disease: a further cue to RLS pathogenesis?**

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*Introduction:* Leg restlessness is frequent in Parkinson's disease (PD) and a key symptom of restless leg syndrome (RLS), whose pathogenesis is still debated. The latter has been associated with dopaminergic impairment and with other conditions such as renal insufficiency. PD patients frequently report low levels of vitamin D, which have been related to poor quality of sleep but not specifically to RLS [1]. Our aim was to investigate the potential association between vitamin D and PTH metabolism with leg restlessness in PD.

*Methods:* 50 PD patients were investigated with motor and non-motor scales and stratified according to the presence of leg restlessness at NMSQ. Serum levels of vitamin D, PTH, calcium, and phosphate, data on supplementations, and calcium intake were also obtained.

*Results:* In our sample, 36% of patients reported leg restlessness. Almost 80% had low vitamin D, while secondary hyperparathyroidism was diagnosed in 21 subjects (45%). Leg restlessness was significantly associated with worse motor symptoms and quality of sleep. Moreover, it was associated with hyperparathyroidism (OR 3.48) and with PTH levels, independently of vitamin D, calcium/phosphate levels, and motor status (multivariate model,  $p=0.02$ ).

*Conclusions:* A relationship between PTH metabolism and parkinsonism has been anecdotally reported [2]. Here for the first time, an intriguing relationship between PTH and leg restlessness in PD was observed. PTH has a putative role in nociceptive modulation, moreover recent literature documented a link between hyperparathyroidism and RLS in patients with renal insufficiency (secondary hyperparathyroidism) [3]. Herein, the presence of secondary hyperparathyroidism - possibly caused by low vitamin D - relates independently to the presence of leg restlessness, adding PTH to the non-dopaminergic landscape of non-motor symptoms in PD.

### **References:**

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