

## Dr. Koeckhoven, *et al* reply

To the Editor:

We highly appreciate the letter of Tufan, *et al*<sup>1</sup>, in which they showed their interest in our manuscript "The Association between Serum 25-hydroxy Vitamin D Level and Upper Leg Strength in Patients with Knee Osteoarthritis: Results of the Amsterdam Osteoarthritis Cohort"<sup>2</sup>. Tufan, *et al* suggested that the assessment of 25-hydroxy Vitamin D [25(OH)D] should be done along with parathyroid hormone (PTH) levels to better define subjects with true Vitamin D deficiency.

In our study, we investigated the relationship between serum 25(OH)D level and upper leg muscle strength in a large cohort of patients with knee osteoarthritis (OA) in the Amsterdam Osteoarthritis cohort using the recommended definition of Vitamin D deficiency (< 50 nmol/l = 20 ng/ml)<sup>3</sup>. Previously, low 25(OH)D and elevated PTH levels were found to be independent determinants of muscle weakness<sup>4</sup>.

We agree with Tufan, *et al* that individuals with a serum 25(OH)D level < 10 ng/ml are more likely to have clinical signs and symptoms, such as muscle weakness and widespread pain, than individuals with serum levels between 10 ng/ml and 20 ng/ml. We also agree that these patients more often have an elevated serum PTH level, and in addition to that, more often have elevated bone resorption markers<sup>5</sup>. As a consequence, the relationship between serum Vitamin D levels and muscle weakness may be stronger in this (small) subgroup of individuals with very low 25(OH)D and high PTH levels. Because we did not measure PTH levels in our cohort of patients with knee OA, we are unable to support this assumption with data. Further research in the subgroup of patients with knee OA with a very low 25(OH)D level along with a high PTH level is recommended, in which the independent effects of 25(OH)D level and PTH level on muscle weakness should also be determined.

ESMEE KOECKHOVEN, MSc, Amsterdam Rehabilitation Research Center | Reade; MARIKE VAN DER LEEDEN, PhD, Amsterdam Rehabilitation Research Center | Reade, and Department of Rehabilitation Medicine, and EMGO Institute for Health and Care Research, VU University Medical Center; LEO D. ROORDA, PhD, Amsterdam Rehabilitation Research Center | Reade; NATASJA M. VAN SCHOOR, PhD, EMGO Institute for Health and Care Research, and Department of

Epidemiology and Biostatistics, VU University Medical Center; PAUL LIPS, PhD, Department of Internal Medicine/Endocrinology, VU University Medical Center; ARJAN DE ZWART, MSc, Amsterdam Rehabilitation Research Center | Reade; JOOST DEKKER, PhD, Department of Rehabilitation Medicine, and EMGO Institute for Health and Care Research, and Department of Psychiatry, VU University Medical Center; MARTIN VAN DER ESCH, PhD, Amsterdam Rehabilitation Research Center | Reade; WILLEM F. LEMS, PhD, Department of Rheumatology, VU University Medical Center, and Amsterdam Rehabilitation Research Center | Reade, Amsterdam, the Netherlands. Address correspondence to M. van der Leeden, Amsterdam Rehabilitation Research Center | Reade, P.O. Box 58271, 1040 HG Amsterdam, the Netherlands. E-mail: M.vd.Leeden@reade.nl

## REFERENCES

1. Tufan AN, Soyul O, Tufan F. True vitamin D deficiency with secondary hyperparathyroidism. *J Rheumatol* 2016;43:2078.
2. Koeckhoven E, van der Leeden M, Roorda LD, van Schoor NM, Lips P, de Zwart A, et al. The association between serum 25-hydroxy vitamin D level and upper leg strength in patients with knee osteoarthritis: results of the Amsterdam Osteoarthritis Cohort. *J Rheumatol* 2016;43:1400-5.
3. Holick MF, Binkley NC, Bischoff-Ferrari HA, Gordon CM, Hanley DA, Heaney RP, et al; Endocrine Society. Evaluation, treatment, and prevention of vitamin D deficiency: an Endocrine Society clinical practice guideline. *J Clin Endocrinol Metab* 2011;96:1911-30.
4. Visser M, Deeg DJ, Lips P; Longitudinal Aging Study Amsterdam. Low vitamin D and high parathyroid hormone levels as determinants of loss of muscle strength and muscle mass (sarcopenia): the Longitudinal Aging Study Amsterdam. *J Clin Endocrinol Metab* 2003;88:5766-72.
5. Kuchuk N, Pluijm SM, van Schoor NM, Looman CW, Smit JH, Lips P. Relationships of serum 25-hydroxyvitamin D to bone mineral density and serum parathyroid hormone and markers of bone turnover in older persons. *J Clin Endocrinol Metab* 2009;94:1244-50.

*J Rheumatol* 2016;43:11; doi:10.3899/jrheum.160835