



SCIENTIFIC LETTERS

Ulnar length as an alternative to height in the management of osteoporosis[☆]

La distancia cubital como una alternativa a la talla en el abordaje de la osteoporosis

The adequate measurement of height in subjects assessed for osteoporosis is of interest for the correct calculation of the body mass index (BMI), a recognized risk factor for osteoporotic fracture. The BMI is related to squared height, which means that small changes in height may have a significant effect on the BMI. Height loss over time results in a fictitious increase in the BMI.¹

The effect of height as measured by a stadiometer, ulnar length, and arm span on the assessment of the risk of fragility fractures was assessed in a sample of patients with suspected osteoporosis referred from different care settings for a bone densitometry test by axial DXA at the Complejo Asistencial Universitario de León.² The study sample consisted of subjects aged 40–90 years with no prior treatment with antiosteoporotic drugs. To estimate the 10-year risk of hip fracture and principal fracture, the application available at the FRAX[®] website for the British population (<http://www.shef.ac.uk/FRAX/>) was used in order that the intervention thresholds of the NOGG guidelines could be applied.^{3,4}

A total of 640 patients (95% females) with a median age of 59.4 years (IQR = 14) and a mean BMI of 26.3 kg/m² (SD = 4.2) were enrolled in the study. Height estimated from arm span was 2.35 cm longer than height measured by a stadiometer ($p < 0.001$). The BMI was greater when height measured by a stadiometer was used in calculation ($p < 0.001$) (Table 1). Median risks of principal and hip fractures with the different height measurements showed no statistically significant differences, so that the use of different height measurement procedures resulted in no significant differences in the number of patients who required bone densitometry or who needed to be treated.

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Table 1 Comparison of heights estimated by stadiometer, arm span, and ulnar length and the BMI.

Difference in means		95% CI	<i>p</i>
Height _{AS} – Height _{ST}	2.35 cm	1.99–2.71	<0.01
Height _{AS} – Height _{UL}	0.87 cm	0.48–1.25	<0.05
Height _{UL} – Height _{ST}	1.48 cm	1.12–1.84	<0.01
BMI _{ST} – BMI _{AS}	0.77 kg/m ²	0.65–0.89	<0.05
BMI _{AS} – BMI _{UL}	0.24 kg/m ²	0.11–0.37	0.06
BMI _{ST} – BMI _{UL}	0.52 kg/m ²	0.40–0.65	<0.05

CI: confidence interval; BMI_{UL}: body mass index using Height_{UL}; BMI_{AS}: body mass index using Height_{AS}; BMI_{ST}: body mass index using Height_{ST}; Height_{UL}: height estimated by ulnar length; Height_{AS}: arm span as height; Height_{ST}: height measured by stadiometer.

It is important when assessing a patient with osteoporosis to ascertain his/her maximum height achieved, because height loss results in a fictitious increase in the BMI and is considered to be an indirect sign of vertebral compression fractures.⁵ This data is often unavailable, but may be estimated from the arm span. Arm span does not change with age, and has therefore been suggested as an accurate indicator of the maximum height achieved.⁶ Unlike maximum height self-reported by the patient, arm span is obtained by objective measurement, provided the patient can stand and has no difficulty in extending both arms.

One of the limitations of arm span is that it should be measured in a precise, exact position. This is impossible when significant neuromuscular weakness, joint deformity, or abnormal muscle tone exists. Arm span measurement is inaccurate in these conditions. In addition, spinal deformities, such as kyphosis, make achieving an adequate position difficult, leading to wrong measurements. Ulnar length could be an alternative to arm span.² The ulna is accessible, and its measurement points are easily identified even in people with severe disability and joint deformities. Ulnar measurement is reproducible and accurate, and provides a precise predictor of height.⁷ No significant differences were seen in our study between arm span and ulnar length, and both estimated a BMI lower than that calculated based on height.

In conclusion, the use of different methods to measure height in the FRAX[®] tool does not affect diagnostic and therapeutic decisions. Height measurement using ulnar length

could be an alternative in cases where measurement might otherwise be impracticable, although additional studies are needed to verify this.

Conflicts of interest

The authors state that they have no conflicts of interest.

References

1. Sorkin JD, Muller DC, Andres R. Longitudinal change in height of men and women: implications for interpretation of the body mass index: the Baltimore longitudinal study of aging. *Am J Epidemiol*. 1999;150:969–77.
2. Mondal MK, Jana TK, Giri Jana S, Roy H. Height prediction from ulnar length in females: a study in Burdwan district of West Bengal (regression analysis). *J Clin Diagn Res*. 2012;6:1401–4.
3. Compston J, Bowring C, Cooper A, Cooper C, Davies C, Francis R, et al. Diagnosis and management of osteoporosis in postmenopausal women and older men in the UK: National Osteoporosis Guideline Group (NOGG) update 2013. *Maturitas*. 2013;75:392–6.
4. Azagra R, Zwart M, Aguyé A, Encabo G. Precauciones necesarias al utilizar los umbrales predictivos de la herramienta FRAX® en la población española para decidir la necesidad de solicitar una densitometría ósea axial. *Aten Primaria*. 2012;44:183–4.
5. Abe K, Tamaki J, Kadowaki E, Sato Y, Morita A, Komatsu M, et al. Use of anthropometric indicators in screening for undiagnosed vertebral fractures: A cross-sectional analysis of the Fukui Osteoporosis Cohort (FOC) study. *BMC Musculoskelet Disord*. 2008;9:157.
6. Ofluoglu D, Unlu F, Akyuz G. Relationship between arm span and height in postmenopausal osteoporotic women. *Rheumatol Int*. 2008;28:737–41.
7. Gauld LM, Fracp M, Carlin JB. Height prediction from ulna length. *Dev Med Child Neurol*. 2004;46:475–80.

Georgios Kyriakos^{a,*}, Alfonso Vidal-Casariago^a, Lourdes Victoria Quiles-Sánchez^b, Alicia Calleja-Fernández^a, Isidoro Cano-Rodríguez^a

^a Sección de Endocrinología y Nutrición, Complejo Asistencial Universitario de León, León, Spain

^b Centro de Salud Jesús Marín, Molina de Segura, Murcia, Spain

* Corresponding author.

E-mail address: giorgos6@yahoo.com (G. Kyriakos).

Kocher-Debré-Semelaigne's syndrome: A case report[☆]

Síndrome de Kocher-Debré-Semelaigne: a propósito de un caso

Kocher-Debré-Semelaigne syndrome is an uncommon condition whose main characteristic is muscle pseudohypertrophy associated with long-standing, untreated severe hypothyroidism.¹ It was first described by Kocher in 1892, and it was not until 1934 that Debré and Semelaigne reported two additional cases. The prevalence of the syndrome is unknown, but identification is vitally important because replacement therapy fully reverses the clinical picture,^{1,2} which is potentially serious.^{3,4}

We report the case of a 9-year-old male who was referred to the endocrinology clinic because he had a very muscular appearance, associated with the occurrence of bilateral supraclavicular and facial oedema, which was most evident in the eyelids. No weight gain, asthenia, growth delay, impaired school performance, behavioural changes, or other associated symptoms were reported. A physical examination showed a significant, generalized increase in musculature both in the trunk and all four limbs, associated with facial and bilateral supraclavicular swelling. The examination was otherwise unremarkable: infantile penis, 3 mL tests, no pubarche or axillary hair, normal cardiac and pulmonary auscultation, a weight of 37.5 kg, a height of 140.9 cm with a

62th percentile (P), a BMI of 18.90 kg/m² (P56), and a bone age of 8 years.

Blood test results included: TSH, 441 mcU/mL; free thyroxine (free T4), 0.1 ng/dL; free triiodothyronine, 0.4 nmol/L; thyroglobulin antibodies, 243 IU/mL; thyroperoxidase antibodies, 1254 IU/mL; creatine phosphokinase (CPK), 983 U/L; glutamic-oxaloacetic transaminase (GOT), 72 U/L; glutamic-pyruvic transaminase (GPT), 44 U/L; total cholesterol (TC), 442 mg/dL; LDL cholesterol, 316 mg/dL; HDL cholesterol, 104 mg/dL; and triglycerides (TG), 469 mg/dL. Because of these findings, thyroid ultrasonography was performed. This showed a thyroid gland of normal size, with an overall decrease in gland echogenicity and a "coarse" echo structure, with millimetric hypoechoic nodules scattered on both sides.

Based on these results, severe hypothyroidism secondary to autoimmune thyroiditis was diagnosed, and treatment was started with levothyroxine 75 µg/day. Laboratory tests performed after six months of treatment showed the following results: TSH, 15 mcU/mL; free T4, 1.4 ng/dL; free T3, 2 nmol/L; CPK, 115 U/L; GOT, 23 U/L; GPT, 15 U/L; TC, 147 mg/dL; LDL, 50 mg/dL; HDL, 87 mg/dL; and TG, 54 mg/dL. An improvement in laboratory test results coincided with phenotype normalization, and muscle pseudohypertrophy and supraclavicular and facial oedema disappeared.

Kocher-Debré-Semelaigne syndrome usually occurs between 18 months and 10 years of age with no sex differences.^{1,2} There is a wide range of clinical symptoms and signs, mainly related to hypothyroidism: lethargy or insomnia, facial myxedema, macroglossia, enlarged fontanelles, mucocutaneous jaundice, constipation, mood changes, thick hair, growth delay, and muscle pseudohypertrophy, preferentially involving the trunk and all four limbs

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