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## EDITORIAL

### On body composition

The Greeks were the first to use the concept of “body composition” around the year 400 B.C. They believed events and diseases had a natural origin. They thought human beings consisted of the cosmos basic elements: fire, wind, earth and water. However, it was not until the 20<sup>th</sup> Century when major advances were made in the implementation of different methods of body composition analysis. The studies were evolving, going from merely experimental to studies of impact in clinical practice.

In recent years, Mexico has been experiencing a nutrition transition phenomenon, where an obesity epidemic coexists with malnutrition.<sup>1</sup> In clinical practice, the patient’s nutritional state can be evaluated using simple anthropometric assessment methods. Body mass index (BMI) is the most utilized method for an obesity diagnosis. BMI has a moderately high sensitivity to identify obesity in a child; however, it has a poor correlation with total body fat, due to the considerable changes in fat mass during childhood.<sup>2</sup> It is important to stress that body composition changes are produced throughout childhood. Children, unlike adults, have a great variation in body composition (including fat and lean tissue), due to maturation, growth, puberty and gender, thus decreasing the accuracy in body and/or abdominal fat estimation using these methods.<sup>3</sup>

Technological advances over the years have allowed the development of multi-compartment models to measure body composition. Examples include: Air displacement plethysmography (Bod Pod®), hydrometry, isotonic solutions prepared with deuterium oxide, dual-energy X-ray absorptiometry (DXA), in addition to computed tomography CT scans and magnetic resonance imaging (MRI) scans. Body composition analysis methods vary in precision, which is defined as the ability to approach the real value of a given body component. A standard method is the one that is accepted as the closest representation of a true body composition, and used as a comparison standard for other methods. The 4-compartment analysis method is considered the gold standard for body composition study. Nevertheless,

it is not a practical measurement because it is expensive and time-consuming. One important characteristic of body composition techniques in children, in addition to its precision, is the fact that it is easy to perform on children of all ages. Similarly, the method should be reproducible, available and safe.<sup>4</sup> In this issue of *Medicina Universitaria* there is a Mexican study comparing the composition between obese and non-obese children, illustrating our previous comment and proving that DXA is a highly precise technique, quantifying the differences in lean and fat tissue, although without proving any difference in mineral content.

Very few clinics have different methods available for body composition measurement in clinical practice, and in recent years, they have used Bod Pod® and DXA in clinical trials to estimate body composition, with a relatively fast scan time, good reproducibility and, in the case of DXA, minimum exposure to radiation.<sup>5</sup>

Having an additional clinical study, using a more appropriate and precise method to determine body composition in children and teenagers, will help us have a better understanding of the key mechanisms which condition, mediate and regulate the distribution and degree of adiposity. In addition, it will give us, in clinical practice, a tool to evaluate the efficacy of interventionist strategies at a pediatric age.

### References

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