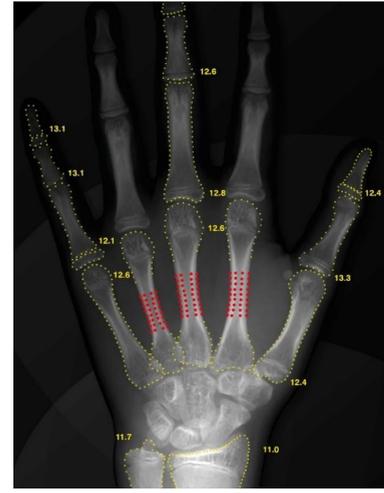


INTRODUCTION. BoneXpert is a software for automated measurement of bone age (BA) and bone health index (BHI) by radiogrammetry. It also includes an adult height prediction model (AHP).¹⁻³ The precision error (repeatability) of the software for BA measure is much smaller than the human rating error and the accuracy relative to the human routine ratings is 0.70-0.80 years. Differences in skeletal maturation between ethnicities have been reported, so it is important to have specific references for the local population.

OBJECTIVE. To present BA and BHI reference curves for Mexican children and adolescents and the possible utility of the AHP in this population.

METHODS. We conducted a prospective, cross-sectional study. We included 915 healthy children of Mexico City's metropolitan area between 2017 and 2018 (range 5 to 18 years). Participants were measured by trained staff. A hand PA radiography was taken and analyzed using BoneXpert software to determine automated BA and BHI. Local Committee Approval HIM 2017-058.

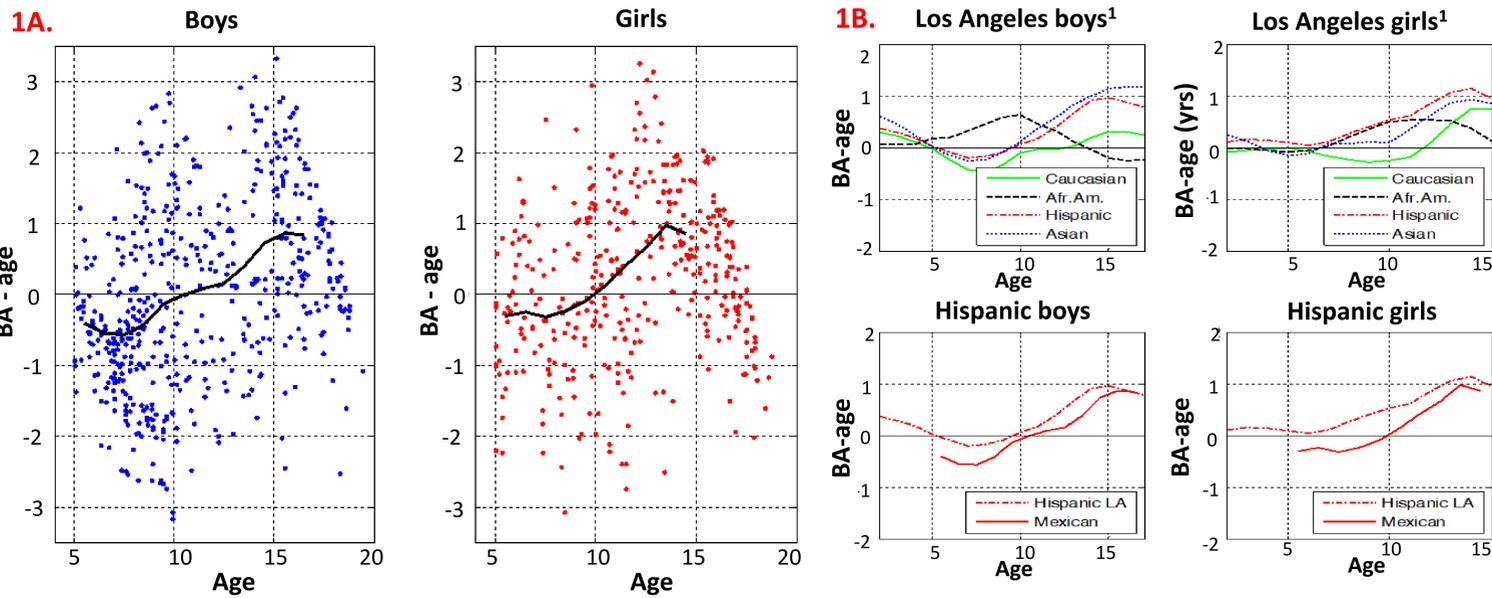


RESULTS

BONE AGE

1A. Automated BA minus age of Mexican children. The black curve represent the average in 3 year intervals.

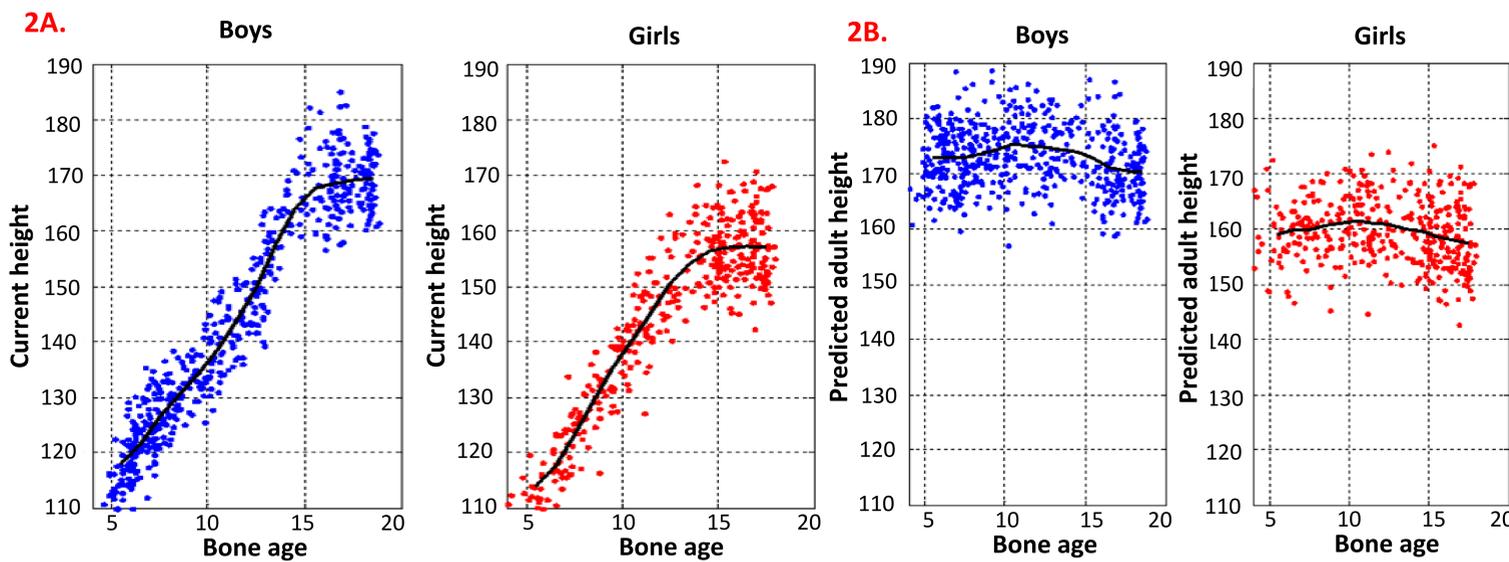
1B. Top plots show the average automated BA minus age in four ethnicities in Los Angeles.¹ Bottom plots show the comparison between Hispanics in Los Angeles (dash lines) and the Mexican children of the present study (solid lines).



ADULT HEIGHT PREDICTION

2A. Height as a function of BA by gender.

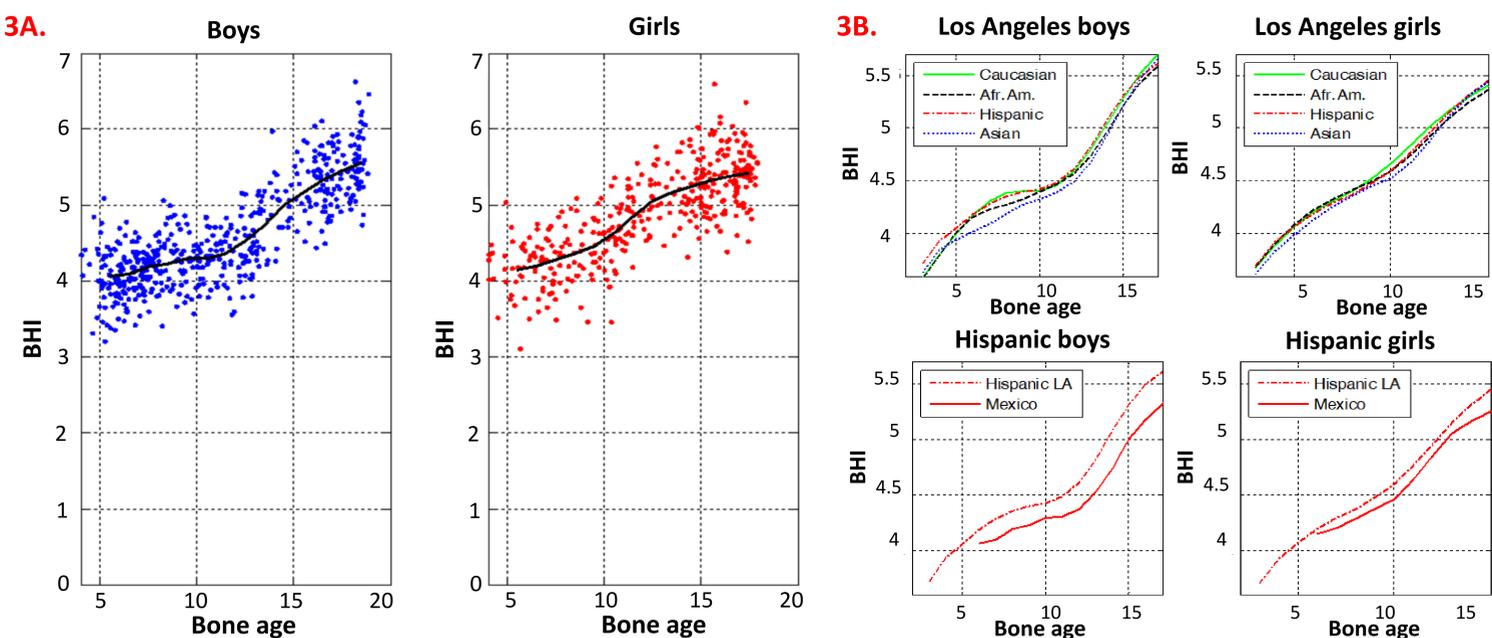
2B. BoneXpert's AHP model as a function of BA by gender (overestimation around 4 cm for males and 2.5 cm for females in prepubertals, if we assume that the average adult height is unchanged over time).



BONE HEALTH INDEX

3A. BHI as a function of BA. The solid curves represents the average of BHI.

3B. Top plots shows an increase in BHI according to BA in different ethnic groups. Bottom plots show a lower BHI in Mexicans in comparison with Hispanics in Los Angeles.



CONCLUSIONS. Mexican children have an acceleration in BA that causes an advance of about 1 year at the end of puberty and it seems than BoneXpert's AHP model overestimate the adult height in this population. In addition, the BHI of Mexican children is lower than other populations mainly at the end of puberty. Longitudinal studies, from childhood until the end of puberty, are required to confirm and evaluate the clinical implications of this observations.

REFERENCES. ¹Thodberg HH, Säwendahl L. Validation and Reference Values of Automated Bone Age Determination for Four Ethnicities. *Acad Radiol* 2010;17:142. ²Thodberg HH, et al. Validation of bone age methods by their ability to predict adult height. *Horm Res Paediatr* 2010;74:15-22. ³Thodberg HH, et al. A paediatric bone index derived by automated radiogrammetry. *Osteoporos Int.* 2010; 21: 1391-400.

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DISCLOSURE. We have nothing to declare for this study.