

An Innovative Ultrasonic Method for Bone Age Assessment of Israeli and Chinese Children

Yu J¹, Zadik Z², Golander A³, Bistrizter T⁴, Yaniv I⁵, Tsoref L⁵, Schwartz T⁵.

1. *Children's Hospital, FuDan University, Shanghai, China.*

2. *Pediatric Endocrine Unit, Kaplan Medical Center, Rehovot, Israel.*

3. *Pediatric Clinic, Dana Children's Hospital, Sourasky Medical Center, Tel-Aviv, Israel.*

4. *Pediatric Endocrine Unit, Assaf Harofeh Medical Center, Zerifin, Israel.*

5. *Sunlight Medical Ltd., Tel-Aviv, Israel*

BACKGROUND

Bone age (BA) assessment is useful as an adjunctive diagnostic tool for growth abnormalities evaluation and adult height prediction. Recently, a new quantitative ultrasound system, Sunlight BonAge (Sunlight Medical Ltd.) was introduced. This non-invasive ultrasonic device is capable of measuring bone acoustic parameters at the wrist and providing an estimation of BA. The goal of the described studies was to estimate the accuracy of the new modality and its correlation to the standard X-ray reading, on different types of populations, Israeli and Chinese.

METHODS:

Two studies, one in China (Children's Hospital, FuDan University, Shanghai) and another one in Israel (Kaplan Medical center, Rehovot) were conducted. Three hundred and one (n=301) healthy Chinese children and 208 healthy Israeli children were measured using the BonAge device. All children underwent an X-ray of the wrist. The hand and wrist X-ray films of each population were interpreted by two pediatric-endocrinologists using the Greulich and Pyle Atlas (1).

RESULTS:

The Chinese population mean age \pm SD was 11.6 ± 3.7 years, with a mean height of 0.2 ± 1.2 (SDS). The Israeli mean age was 11.6 ± 3.1 years, with a mean height -0.8 ± 1.4 (SDS). The r^2 (Pearson correlation coefficient) between both methods was 0.9 for boys and girls in both studies. Accuracy, obtained for the Chinese population, was 1.2 ± 0.9 years for boys and 1.0 ± 0.9 years for girls. Accuracy for the Israeli population was 1.1 ± 0.8 years for boys and 1.0 ± 0.8 for girls.

CONCLUSION:

The accuracy and the correlation of the ultrasonic BA assessment to the X-ray reading were similar for both ethnic groups. The ability of the BonAge device to measure the BA of children from different ethnic groups and to provide an accurate skeletal maturity determination was demonstrated.

References:

1. Greulich WW, Pyle SI, Radiographic atlas of skeletal development of the hand and wrist, 2nd ed. Stanford California, Stanford University Press, 1959.

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