

BONEXPERT ADULT HEIGHT PREDICTION OUTPERFORMS THE BAYLEY AND PINNEAU METHOD IN TALL MALE ADOLESCENTS

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INTRODUCTION

Adult height (AH) predictions by the manual Bayley and Pinneau (BP) method in tall boys have shown large confidence intervals up to a bone age of 15 years (1).

The adult height BoneXpert prediction method, which is based on an automated bone age reading, has not been evaluated in tall adolescents (2).

AIM

To compare the bias between the manual Bayley and Pinneau (BP) method and the BoneXpert (BE) method in tall male Flemish adolescents.

METHODS

20 untreated young adult (age > 19 years) men, who had been evaluated for non-pathological tall stature (height SDS > 2) during adolescence at three Flemish University hospitals, were studied.

AH was obtained by a recent measurement at the hospital or by self-measurement.

X-rays of the left hand and wrist, which had been obtained digitally at initial evaluation, were scored again using the Greulich and Pyle atlas by the same experienced examiner (JDS) as well as by the BE software (version 3.0).

AH was compared with the BP and BE AH (version 2.23) height prediction methods.

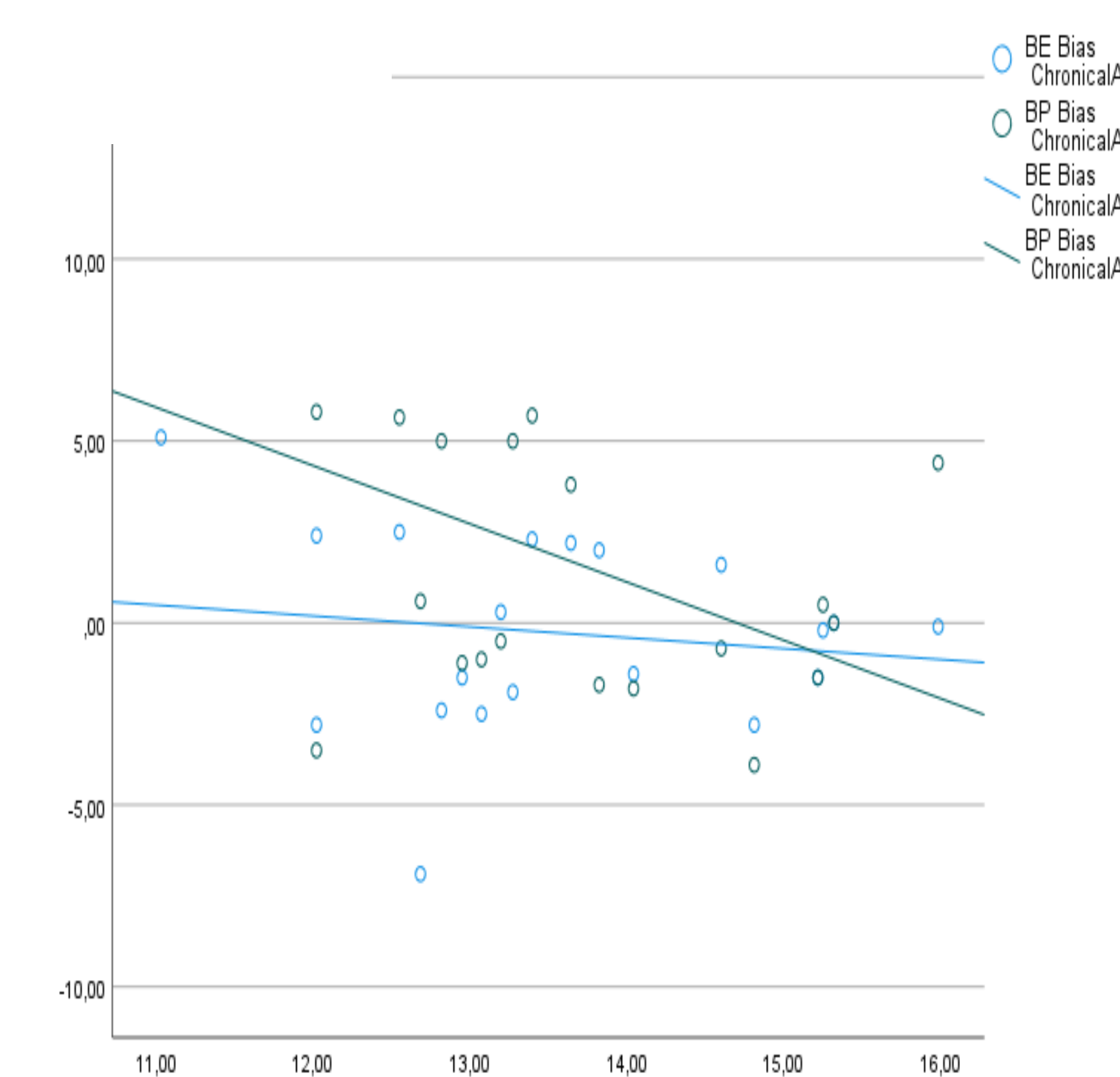
Bias was calculated as the mean of the difference between predicted and measured AH.

RESULTS

Table 1: Auxological and radiological characteristics of the included adolescents with tall stature

	Median	Range (min.-max.)
Height at initial assessment (SDS)	3	2 – 5.2
Chron. age at initial assessment (Yr)	13.3	11-16
Bone age (BE)	14.03	11.84 – 16.76
Bone age (BP)	14.25	12 - 17
Difference BE bone age and BP bone age (Yr)	0.05	-0.83 - 0.79
BE bone age advancement (Yr)	0.43	-1.2 - 1.9
Measured AH (cm)	197	191 – 208
BE predicted AH (cm)	197.2	191.5 – 203.4
BP predicted AH (cm)	198	191 - 208
BE Bias and limits (cm)	0.3	-5.5 – +4.9
BP Bias and limits (cm)	1.8	-6.8 – +10.4

Fig 1 : Scatterplot of BE bias and BP bias in relation to chronological age at prediction



AH correlated with BP ($r = 0.582$; $p = 0.007$) and the BE ($r = 0.774$; $p < 0.0005$) AH predictions

Table 3 Correlation of BE bias and BP bias with auxological characteristics at moment of prediction

	BE Bias R (p value)	BP Bias R (p value)
Chronological age	-0.143 (0.546)	- 0.462 (< 0.040)
Bone age	-0.335 (0.149)	- 0.609 (< 0.004)
Bone age advancement	-0.240 (0.308)	-0.217 (0.357)
Height SDS	-0.230 (0.330)	-0.053 (0.823)

CONCLUSIONS

In tall adolescent males aged between 11 to 16 years and with moderate bone age advancement, the BE AH prediction method performs better than the classic BP method, given its

- higher correlation with AH
- smaller limits of agreement
- lower bias.

REFERENCES

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