Impact of using WHO vs national growth charts on the clinical performance of a decision rule for growth monitoring

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Background

Since the publication of international growth charts by the World Health Organization (WHO) in 2006,(1) the use of national growth charts for growth monitoring has been questioned. Two studies have reported a theoretically higher proportion of children with Turner syndrome or cystic fibrosis early detected using national vs WHO growth charts.(2,3) We have shown that, among the 7 algorithms proposed in the literature for growth monitoring, the Grote clinical decision(4) rule was the best performing one for early detection of children with growth hormone deficiency (GHD) using French growth charts (e-poster n°1028).(5)

Objective

To evaluate the potential impact of using WHO vs. national (French) growth charts on the performance of a clinical decision rule for detecting children with GHD.

Conclusion

The use of WHO growth charts instead of French references when applying the Grote clinical decision rule for the early detection of GHD would lead to a significantly higher sensitivity. The impact of using WHO on early detection of other target conditions of growth monitoring must be evaluated before any implementation.

Methods

Using a case-referent approach, we applied the Grote clinical decision rule on growth data of 33 children with GHD related to pituitary-stalk interruption syndrome born between 1990 and 2006 in France (cases), and 2,200 apparently healthy French children followed longitudinally from birth (referents).

The Grote clinical decision rule is based on several auxological criteria combined in various ways: standardized height, distance to standardized target height, absolute height deflection, small-for-gestational age with no catch-up, and disproportion and/or dysmorphic features. The sensitivities, specificities and theoretical reduction in time to diagnosis of the rule using national or WHO growth charts were calculated and compared using McNemar/Wilcoxon tests for matched pairs/series.

Results

The application of the Grote clinical decision rule would have led to a significantly higher sensitivity and lower specificity with the WHO compared to French growth charts. No statistically significant difference in theoretical reduction in time to diagnosis was identified between the two growth charts.

Table: Sensitivity, reduction in time to diagnosis, and specificity of Grote clinical rule for GHD detection, according to WHO or French growth charts

Grote clinical rule	WHO growth charts	French growth charts	p-value
Sensitivity (%) *(n=33)*	78.8	66.7	**p=0,04**
Specificity (%) *(n=2250)*	98.3	99.2	**p<0,01**
Reduction in time to diagnosis (year) *(n=33)*	0.77 [0.25-2.67]*	0.34 [0.00-1.75]	p=0,12

* Median [Q1-Q3]
Statistically significant difference (p<0.05) in sensitivity, specificity and reduction in time to diagnosis between WHO and French growth charts

References

(1) WHO Multicentre Growth Reference Study Group. Acta Paediatr Suppl, 2006.
(2) Machogu et al. J Pediatr Gastroenterol Nutr, 2015.
(3) Saari et al. JAMA Pediatr, 2013.
(4) Grote et al. Arch Dis Child, 2008
(5) Sempé et al. Theraplix, Paris, 1979.

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