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COMPARISON OF WHO, INTERGROWTH-21 AND HADLOCK FETAL GROWTH CHARTS IN INDIAN POPULATION

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INTRODUCTION

- Population-based reference charts are used commonly in both clinical and research settings to discriminate between normal and SGA infants
- World Health Organization (WHO) and INTERGROWTH-21 (IG-21) groups, attempted to create a universal fetal growth chart. Both charts have included the Indian population. The INTERGROWTH-21 claims that a single chart can be used across various ethnicities whereas, WHO chart has shown significant variation in fetal biometry and birth weight across different ethnicity
- We tested which of the two growth charts fits best in detecting SGA babies and compared fetal biometry measurement variations when WHO, IG 21, and Hadlock charts are used

OBJECTIVE

- To evaluate the performance of WHO, INTERGROWTH-21 and Hadlock fetal growth charts in the Indian population

STUDY DESIGN

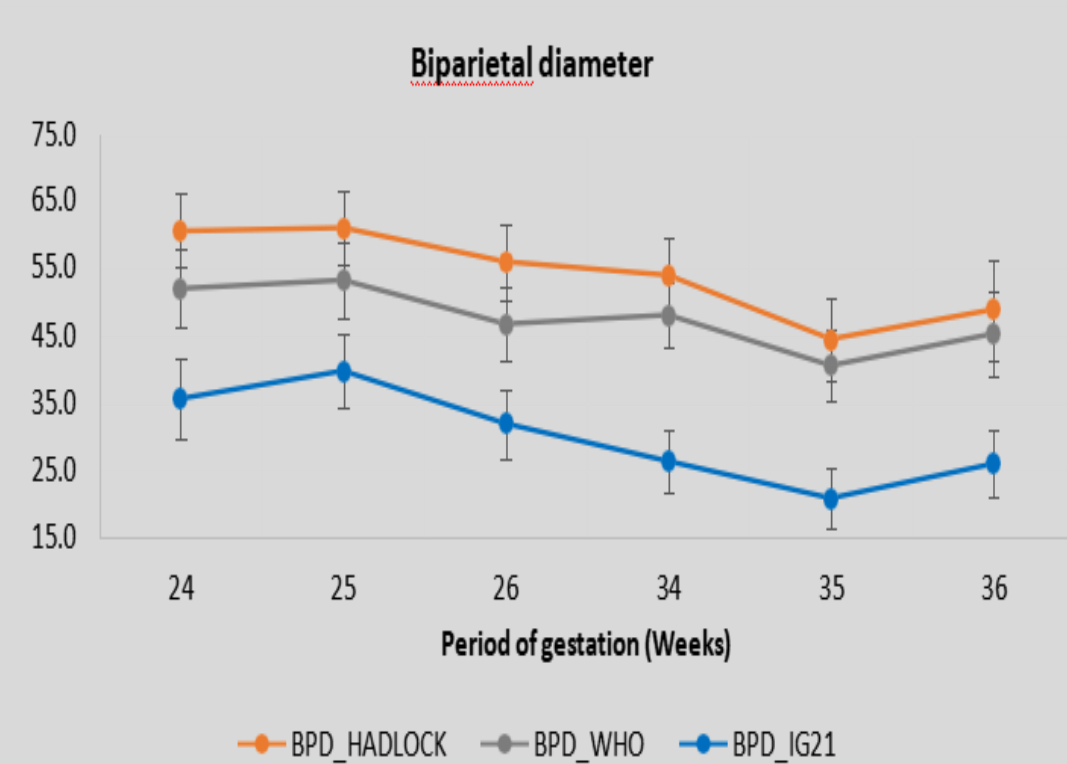
- A prospective observational study, conducted at AIIMS, New Delhi over a period of 2 years

MATERIALS AND METHODS

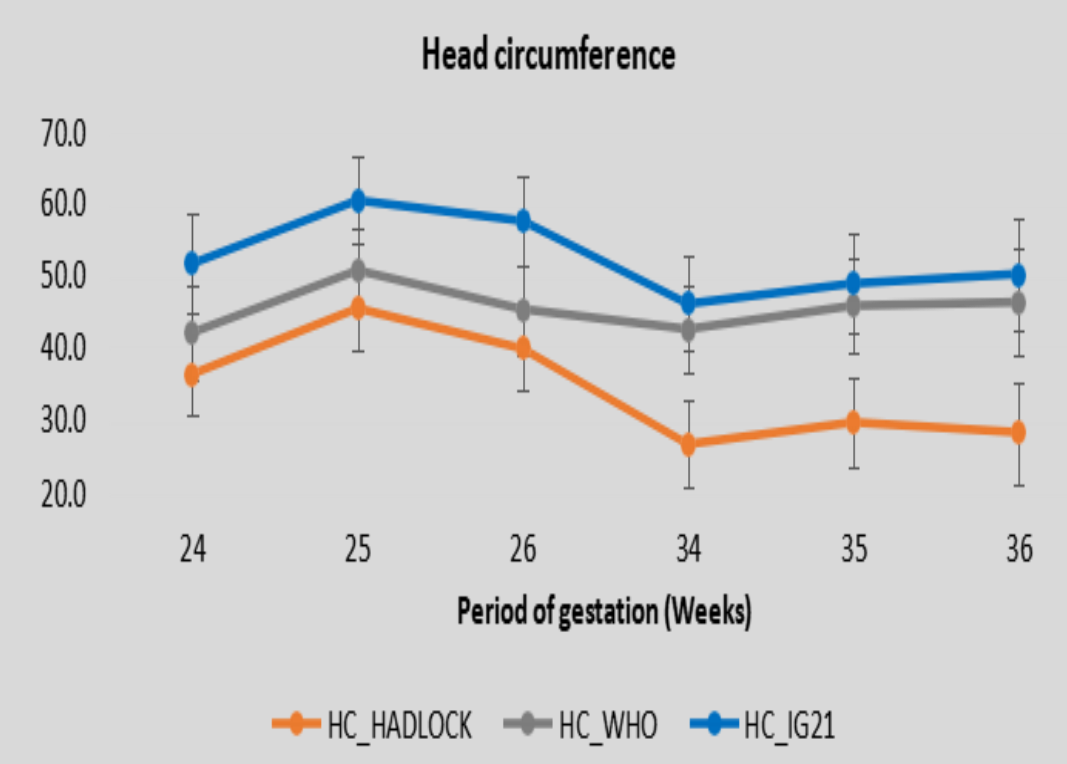
- 250 pregnant women were recruited. All women underwent fetal biometry scans twice at 24-26 weeks gestation and 34-36 weeks gestation
- Sociodemographic data, mode of delivery, NICU admissions, classification of SGA based on local charts was recorded
- The fetal biometry was plotted on the Hadlocks, WHO and Intergrowth-21 fetal growth charts and compared
- The birthweight was classified and compared between the AIIMS Nursery charts, WHO and Intergrowth-21 charts

RESULTS

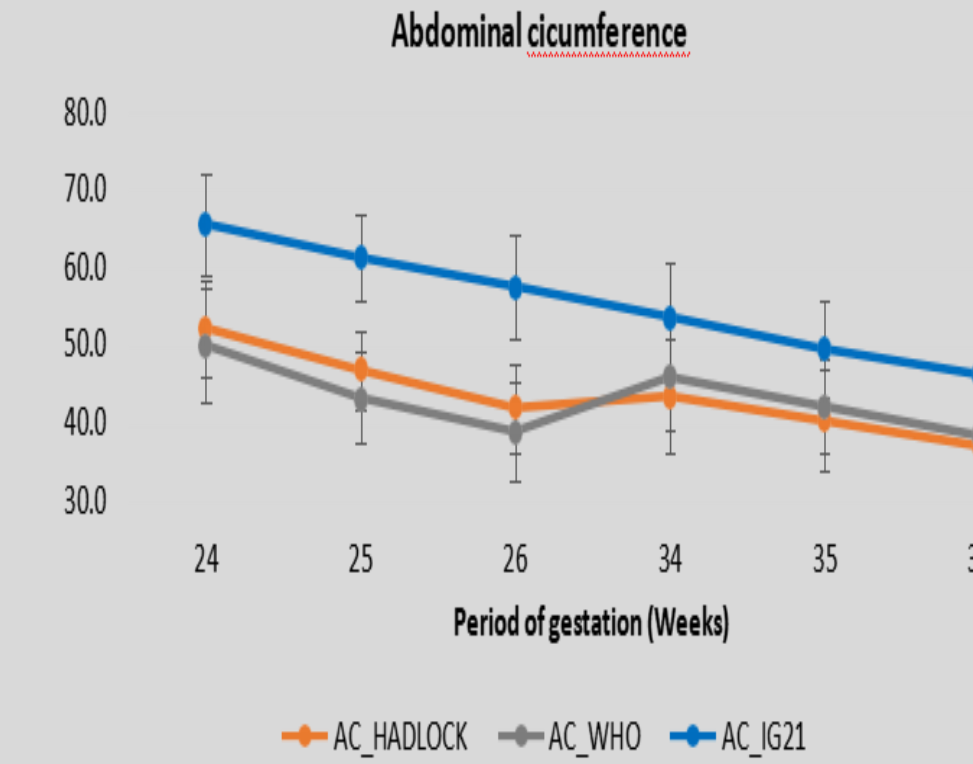
- WHO and INTERGROWTH-21 growth charts significantly (P value <0.001) underestimates BPD and overestimates HC, FL, AC and EFW as compared to Hadlock
- At all gestations INTERGROWTH-21 growth charts had the highest mean percentiles for HC, AC, FL, and EFW but lowest mean centiles for BPD. Also, WHO and Hadlock mean percentile curves behaved similarly for BPD, AC, and EFW at all gestations, but only in the 2nd trimester for FL and HC as evidenced by confidence interval overlap for both the two growth charts



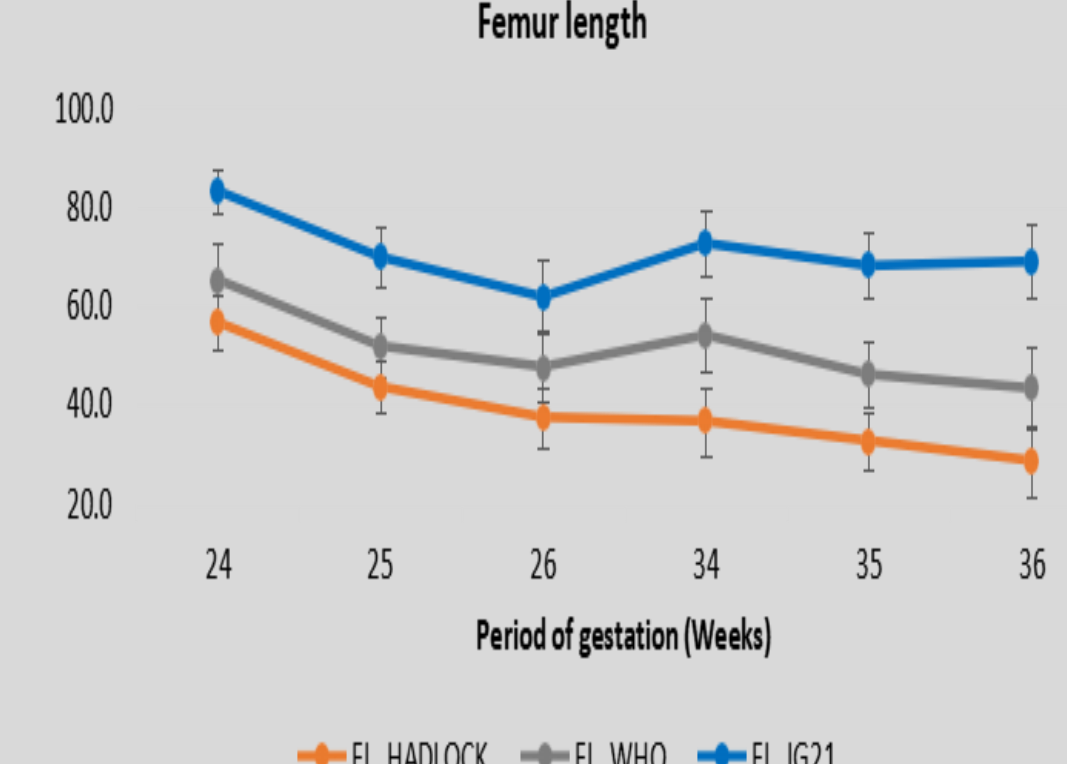
Hadlocks, WHO, and IG-21 mean centiles comparison for BPD



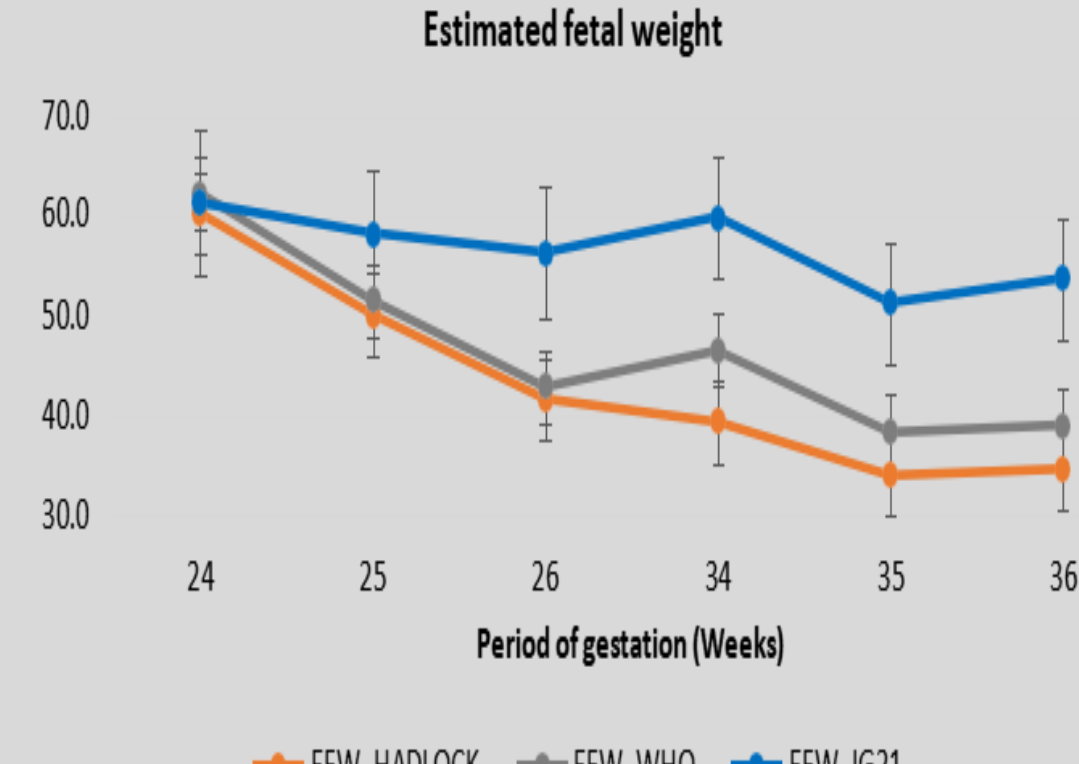
Hadlocks, WHO, and IG-21 mean centiles comparison for HC



Hadlocks, WHO, and IG-21 mean centiles comparison for AC



Hadlocks, WHO, and IG-21 mean centiles comparison for FL



Hadlocks, WHO, and IG-21 mean centiles comparison for EFW

- For birthweight WHO and IG-21 over-diagnosed SGA (PPV 56.5% and 54.2% respectively) compared to Nursery charts. Also, both the growth charts had low sensitivity (28.1%;24.2%) but fairly high NPV (87.4%;86.2%) for predicting NICU admissions

CONCLUSION

Since there are no nomograms available for the Indian population and neither of the two growth charts completely describe the trends in Indian fetal growth, it necessitates the creation of indigenous growth charts with the inclusion of region-specific populations in India with larger sample size.

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- Kiserud T, Piaggio G, Carroli G, Widmer M, Carvalho J, Neerup Jensen L, et al. The World Health Organization Fetal Growth Charts: A Multinational Longitudinal Study of Ultrasound Biometric Measurements and Estimated Fetal Weight. Myers JE, editor. PLOS Med. 2017 Jan 24