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Ethnicity-Specific Normative Models of Quadruple Test as a Screening Test for Down Syndrome

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Abstract

Background and objective: The quadruple test screening widely use in Thailand for fetal Down Syndrome screening however the previous studies have shown the difference between the conventional Caucasian reference model with ethnic correction and ethnicity-specific model. This research aims to generate the specific model for Thai people based on calculated serum biomarkers (Alpha-fetoprotein, beta-human gonadotropins, inhibin-A, and unconjugated estriol)

Methods: The study enrolled 5,719 Thai singleton pregnancies between 14-21 weeks of gestational age under took part in the Quad test at our network hospitals of northern Thailand during June 2015 and May 2017. Each serum biomarker was calculated and converted to multiple of median to create the Thai-specific model by using quantile regression and multivariable factorial polynomial technique as a function of gestational age and maternal weight.

Results: The significant difference of MoMs of all serum biomarkers using the Thai-specific model compared with the conventional model was reported (p <0.0001) AFP and beta-hCG derived from the Thai-specific model were approved higher while inhibin-A and uE3 were too variable at greater MoMs.

Conclusions: Thai-specific models are more appropriate use for Thai people. On the other side, the ethnicity-specific model based on the characteristic of each population is suitable more than the conventional model with ethic correction.

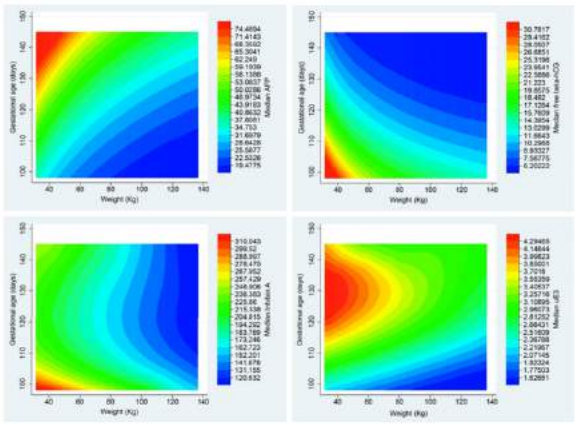


Figure1 Rainbow contour plots of predicted median AFP, beta-hCG, inhibin-A, and uE3 as a function of gestational age(days) and maternal weight(kg) based on the established specific model.

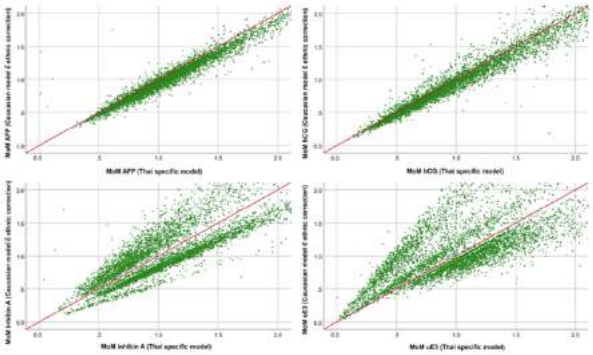


Figure2 The relationship between the MoMs for AFP, beta-hCG, inhibin-A, and uE3, using the Thai specific model on the X-axis and the Caucasian model with ethnic correction on the Y-axis. The line represents the line of equity or expected MoMs.



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