EcoVue®
Ultrasound Gel

Change Your Vue.

Ergonomically designed for ease-of-use, the eco-friendly FlexPac® creates higher product-to-package ratio reducing waste and improving sustainability. Designed with patient safety in mind, our non-refillable & single use products will forever *Change Your Vue* of ultrasound gel.

Introducing the next generation of Ultrasound Gel

Sustainable Packaging

Natural Ingredients

Reduces CO^2 Footprint

20g Packet
Sterile & Non-Sterile

32g FlexPac®
Sterile & Non-Sterile

60g Flip-Top Tube
Non-Sterile

250g FlexPac®
Non-Sterile

EcoVue.com

Comment on "Customized Fetal Growth Charts for Parents' Characteristics, Race, and Parity by Quantile Regression Analysis: A Cross-sectional Multicenter Italian Study"

To the Editor: We read with great interest the article by Ghi et al[1]: "Customized Fetal Growth Charts for Parents' Characteristics, Race, and Parity by Quantile Regression Analysis: A Cross-sectional Multicenter Italian Study". We agree with the limits and the strengths that the authors discussed. Nevertheless, apart from typing errors (such as "gesational" in Figure 1), we are amazed by several biased data interpretations in the article that do not let us to create the customized reference charts.

First, when the authors provide the example of how to compute the 95th percentile for head circumference of a fetus at 30 weeks' gestation, they express maternal and paternal heights in meters (1.80 and 1.60), even if in the statistical analysis they are declared to be expressed in centimeters. According to the article, the 95th percentile for head circumference at 30 weeks is 247.8; that is too low according to other different reference charts[2–4]; whereas it is 292.5, expressing the heights in centimeters. Furthermore, in Figure 2, a new example has these covariates expressed in centimeters.

Second, the aforementioned formula contains a further mistake: the authors did not multiply the appropriate value for Central African race (5.9088 as reported in Table 3), but used the SE value (5.8718).

Third, in the "Results" section, the authors state that different covariates were not statistically significant for each parameter and/or for all of the percentiles. However, there is a slight discrepancy between the *P* values (Tables 2–5) and the description of the influence of covariates according to the percentiles. We report only one example: the authors declared that the influence of parity was present for values in the 50th percentile and higher for head circumference. However, in Table 3, it should be true until the 90th percentile, as *P* values for the 95th and 97th percentiles were .1646 and .3882, respectively.

Last but not least, the log(wk) 25th percentile for abdominal circumference (Table 4) is incorrect, as it leads to an inconsistent value according to the trend.

We hope that these suggestions could be helpful to better appreciate the article, and we thank the editor for giving us an opportunity to clarify these issues.

Francesco Padula, MD, Antonio Simone Laganà, MD, Salvatore Giovanni Vitale, MD, Claudio Giorlandino, MD

Department of Prenatal Diagnosis
Altamedica Fetal Maternal Medical Center
Rome, Italy (F.P., C.G.)
Unit of Gynecology and Obstetrics
Department of Human Pathology in Adulthood and Childhood "G. Barresi"
University of Messina
Messina, Italy (A.S.L., S.G.V.)

doi:10.7863/ultra.16.01008

References

1. Ghi T, Cariello L, Rizzo L, et al. Customized fetal growth charts for parents' characteristics, race, and parity by quantile regression analysis: a cross-sectional multicenter Italian study. *J Ultrasound Med* 2016; 35:83–92.
2. Paladini D, Rustico M, Viora E, et al. Fetal size charts for the Italian population: normative curves of head, abdomen and long bones. *Prenat Diagn* 2005; 25:456–464.
3. Papageorghiou AT, Ohuma EO, Altman DG, et al. International standards for fetal growth based on serial ultrasound measurements: the Fetal Growth Longitudinal Study of the INTERGROWTH-21st Project. *Lancet* 2014; 384:869–879.
4. Giorlandino M, Padula F, Cignini P, et al. Reference interval for fetal biometry in Italian population. *J Prenat Med* 2009; 3:62–65.

Reply

To the Editor: We thank Dr Padula and colleagues for their interest in our work and for their painstaking effort in spotting some minor typing errors that were overlooked at proof correction. We will try to briefly address the main criticisms that they have raised.

First, the equation reported at the end of the "Results" section[1] is just an example to explain to the reader how to use the quantile regression formula. In this simulation, maternal and paternal heights are expressed in meters (1.60 and 1.80, respectively, and not 1.80 and 1.60, as reported in the letter by Dr Padula and colleagues), and there is no correction for maternal race, since the mother belonged to a race different from Central African. As a consequence, the results reported are just an example of a mathematical adjustment and do not reflect the normative ranges. As usual in a scientific work, these values are reported in Tables 2–5. In each table, 180 numerical indices with 4 decimals are reported, and there is in fact a mistake in the log(wk) 25th percentile for abdominal circumference, which is erroneously reported as 240.7708 instead of 260.7708 (Table 4).

As for the different performance in terms of significance of the covariates in the different percentile classes, this finding is not at all surprising but is actually one of the

advantages of quantile regression analysis. This statistical approach, with respect to the conventional least squares method, allows optimization of the estimate of the influence of a covariate (eg, parity) at the percentile value of interest.

In the "Discussion" section, we acknowledged the relatively higher complexity of the individual percentile calculations by quantile regression. To overcome this limitation, the Società Italiana di Ecografia Ostetrica e Ginecologica has updated its app (iObstetrics), which allows automatic calculation of the percentiles of the fetal biometric parameters of interest after input of the observed values and of necessary covariates. This app is freely available to Società Italiana di Ecografia Ostetrica e Ginecologica members. Furthermore, a new version of a popular electronic database (Astraia Software, Munich, Germany) has just been released to allow automatic calculation of the customized reference limits for gestation that we developed.

Finally, we would like to emphasize that the number of observations collected in our multicenter study was remarkably higher than in the 2 quoted retrospective studies previously performed in Italy.[2,3] We do hope that the use of this large data set of pregnancies, together with the statistical approach followed, which allows customization of fetal biometric measurements for parental characteristics and obstetric history, will be able to demonstrate high accuracy in the assessment of fetal growth. A prospective validation study is currently ongoing.

Tullio Ghi, MD, Enrico Ferrazzi, MD, Federico Prefumo, MD, Giuseppe Rizzo, MD

On behalf of the Società Italiana di Ecografia Ostetrica e Ginecologica Working Group on Fetal Biometric Charts

Department of Obstetrics and Gynecology
University of Parma
Parma, Italy (T.G.)

Department of Obstetrics and Gynecology
University of Milan Buzzi Children's Hospital
Milan, Italy (E.F.)

Department of Obstetrics and Gynecology
University of Brescia
Brescia, Italy (F.P.)

Department of Obstetrics and Gynecology
University of Rome Tor Vergata
Rome, Italy (G.R.)

doi:10.7863/ultra.16.01056

References

1. Ghi T, Cariello L, Rizzo L, et al. Customized fetal growth charts for parents' characteristics, race, and parity by quantile regression analysis: a cross-sectional multicenter Italian study. *J Ultrasound Med* 2016; 35:83–92.
2. Paladini D, Rustico M, Viora E, et al. Fetal size charts for the Italian population: normative curves of head, abdomen and long bones. *Prenat Diagn* 2005; 25:456–464.
3. Giorlandino M, Padula F, Cignini P, et al. Reference interval for fetal biometry in Italian population. *J Prenat Med* 2009; 3:62–65.