sciendo

ACTA FACULTATIS
MEDICAE NAISSENSIS

DOI: 10.2478/afmnai-2018-0034

UDC: 618.29(55)

Original article

Error Analysis for Determination of Accuracy of Johnson's Formula, Dare's Formula and Mother's Opinion for the Estimation of Birth Weight: Results of an Iranian Cross-Sectional Study

Somayeh Alirezaei[1], Elham Azmoude[2], Asma Ghaderi[3]

[1]*Ph.D. Student in Reproductive Health, Student Research Committee, Faculty of Nursing and Midwifery, Mashhad University of Medical Sciences, Mashhad, Iran*
[2]*Department of Midwifery, Faculty of Nursing and Midwifery, Torbat Heydariyeh University of Medical Sciences, Torbat Heydariyeh, Iran*
[3]*Student Research Committee, Torbat Heydariyeh University of Medical Sciences, Torbat Heydariyeh, Iran*

SUMMARY

Accurate fetal weight estimation is important for the management of birth. According to the existing literature, none of the clinical techniques is superior to any other. This study aimed to compare error analysis for the determination of the accuracy of Johnson's formula, Dare's formula and mother's opinion for the estimation of birth weight.

A cross-sectional study involving 147 full-term, cephalic, singleton pregnancies, was performed. The mother's opinion was recorded and Johnson's and Dare's formulas were used to calculate the fetal weight. Accuracy was determined by percentage error, absolute percentage error, and proportion of estimates within 10% of actual birth-weight. Statistical analysis was done using the RM ANOVA, Friedman and Cochran. $P < 0.05$ was considered significant.

The birth weight was correctly estimated in 34.7%, 58.5%, 66% of the cases using the mother's estimate, Dare's and Johnson's formulas. Respectively the proportion of the mother's estimate and Dare's formula was significantly lower than that of Johnson's formula for all birth weights. No significant difference was observed in all the measures of accuracy for the low birth-weight range. The mean error of Johnson's formula in both normal weight and macrosomic groups was less than those obtained by the Dare's formula and mother's opinion.

The Johnson's formula is more accurate in actual birth weight estimation than the Dare 's one and mother's opinion. In the normal weight range, Johnson's formula is more accurate of the two, while in the macrosomic group, Dare's formula appears to be more accurate.

Key words: **fetal weight, birth weight, Iran**

Corresponding author:
Elham Azmoude
Email: azmoudehe@gmail.com

INTRODUCTION

Fetal weight estimation is a vital part of pregnancy, labor and childbirth care (1). In the last decade, the routine practice of estimating fetal weight has been supported as a standard component of antenatal care to detect and monitor the abnormal growth of fetus (2).

Estimation of fetal weight is also an important part of the obstetrics management of high-risk pregnancy (3). According to the scientific reports, 11.1% of newborns had a birth weight of less than 2,500 g and 3 % of them weighed above 4,500 g (4, 5). Any deviation from the normal weight is associated with an increased risk of maternal and newborn complications during labor and puerperium (6). Additionally, a large proportion of perinatal mortality is attributed to birth weight, which is considered an important predictor of newborn survival (7). Generally, the obstetric care policies are greatly influenced by fetal weight estimation especially for the management of diabetic pregnancy, the prevention of prematurity, prediction of fetal-pelvic disproportion, the decision for the optimal route of delivery in breech presentation, the trial of vaginal birth after previous cesarean section and detection of intrauterine growth retardation (8). On the other hand, taking care of low and high weight infants requires special conditions and should be performed in centers with good facilities, which can increase the chance of survival (9). Therefore, precise determination of fetal weight is crucially important to prevent obstetric complications, especially in suspected cases of macrosomia or intrauterine growth restriction as well as in preterm deliveries (6). In addition, the need for a quick and easy method for estimating fetal weight has been clearly defined (10).

In this regard, there are two main methods for fetal weight estimation: first, the clinical estimation based on abdominal palpation, fundal height, and Leopold's maneuver, and second, using ultrasound and MRI imaging techniques (11). MRI has been reported as the most accurate method of fetal weight estimation and ultrasound, despite its limitations, is known as a standard method for the estimation of fetal weight and prediction of fetal growth disorders. However, due to their high costs, the clinical value of these methods has been questioned (1). Unfortunately, up to date, there is no study which clearly specifies the best fetal weight estimation method. Some studies have considered ultrasound and others have considered clinical methods for one or two categories of weight groups, and rarely a method has been presented to well estimate fetal weight in all the three categories (9). Abdominal palpation using Leopold's maneuver and Johnson's formula is a method used for estimating fetal weight. Banerjee reports no significant difference in the evaluation of the diagnostic value of Johnson's formula and ultrasound method (12). Khani (13) also compared abdominal palpation, Johnson's technique and ultrasound in the estimation of the weight of SGA fetuses and reported a significant difference between these three methods with the actual birth weight. The most accurate estimating methods included ultrasound, Johnson's formula, and abdominal palpation; however, there was no significant difference between these three methods for AGA fetuses. Dare's formula is another clinical method evaluated by Dare in estimating fetal weight. It was considered a very effective method in fetal weight estimation (12). Johnson's methods is a subjective method; thus, it is difficult for young and inexperienced physicians and midwives. However, the measurement of abdominal circumference and the uterus height is an objective method which is easy to train. Another method used in some studies is relying on mother's perception of her child's weight (10). In this regard, Chauhan's study was the first study in 1992 to report the diagnostic value of maternal estimates of fetal weight as valid as ultrasound technique (11). In some advanced countries, surprisingly, maternal estimates of fetal weight were as precise as clinical methods (14). These three methods, as simple, effective and inexpensive, are used for fetal weight estimation; however, contradictory findings have been reported regarding the effectiveness of each method. In one of these studies, Torloni (15) compared clinical weight estimation methods including Johnson's and Dare's formulas and mother's perception of her child's weight and ultrasound and reported no significant difference. Therefore, given the importance of fetal weight estimation during labor, the present study was designed to do a comparative evaluation of these methods and to know which method is more precise in fetal weight estimation at term.

METHODS AND MATERIAL

This descriptive cross-sectionals were conducted at the maternity ward of a governmental Hospital, Torbat Heydariyeh, Iran. The duration of the study period was four months, from March 1 to July 30, 2017. The sample size was calculated as 147 pregnancies, using 95% confidence interval ($\alpha = 0.05$) and 80% power, based on the pilot study and below formula.

$$n = \frac{z^2_{1-\frac{\alpha}{2}} p(1-p)}{d^2}$$

The inclusion criteria were: term singleton pregnant women in early labor, cephalic presentation, alive and healthy fetus, the absence of fetus and uterus abnormalities, maternal BMI < 30, intact membranes. The exclusion criteria were: preterm and post-term pregnancy, placental abruption, amniotic fluid disorders (oligo and hydramnios), placenta previa, preeclampsia, gestational diabetes, neonatal abnormalities or stillbirth.

All eligible participants were counseled regarding the study, and their written consents were obtained before recruitment into the study. After that, each woman was asked about her baby's weight and this information was recorded. By starting active phase (3–4 cm of cervix dilatation), the participants were asked to empty their bladder and the researcher measured her symphysiofundal height and abdominal girth, between contractions, using a standard sewing tape. The measurements were performed in the supine position, with her legs extended, and were rounded to the nearest centimeter.

The fundal height was measured from the highest point on the uterine fundus to the midpoint of the upper border of the symphysis. Thereafter, the abdominal circumference was measured immediately at the level of the umbilicus.

The researcher then performed a pelvic examination to evaluate cervical dilation and the degree of descent of the fetal head through the birth canal. Then the fetal weight was calculated according to Johnson's and Dare's formulas.

Johnson's formula: fetal weight in grams (Johnson's original formula converted to grams, where ounces were multiplied by 28.34 and pounds were multiplied by 0.453) = 155 x (fundal height in cm (for patients over 90 kg, subtract 1 from the fundal height) – K); K = 11 (fetal head at plus stations); K = 12 (fetal head at zero station) and K = 13 (fetal head at minus stations). Dare's formula: fetal weight in grams = fundal height in cm × abdominal girth in cm. Immediately after delivery, the infants were weighed by using a calibrated digital balance. According to the actual birth, infants were placed at three weight groups: low birth weight = less than 2,500 gr, normal weight = between 2,500 – 4,000 gram and macrosomic = more than 4,000. Also, neonatal grouping was categorized based on moderate weight for gestational age. Infants were considered as SGA when their weights were below the 10th percentile, AGA when they were between the 10 – 90th percentile and LGA when they were higher than 90th percentile. All clinical FWE was done personally by one of a researcher who was a trained graduate midwife. Gestational age was calculated from the day of onset of the mother's last normal menstrual period or by using of ultrasonographic examination performed before reaching 20 weeks. After data collection, the analysis was done with SPSS software version 20 and statistical tests such as Chocran, Fridman, and RMANOVA were used.

The accuracy of the three methods for FWE was assessed by calculating the percentage (relative) error, absolute percentage error, and the ratio by percentage of estimate within 10% of actual birth weight.

Percentage (relative) error was defined as estimated fetal weight (EFW) - actual birth weight (ABW)) × 100/ABW and absolute error as (absolute value (EFW - ABW)) x 100/ABW (2). The mean percentage error represented the sum of the positive (overestimation) and negative (underestimation) estimation from actual birth weight, and the mean absolute percentage error was the sum of the absolute deviation (regardless of their direction) reflecting the size of the overall predictive error in terms of actual birth weight (3). A p-value < 0.05 was considered significant. Ethical clearance for the study was obtained with code 1394.6 from the Torbat Heydariyeh University of Medical Sciences, Iran.

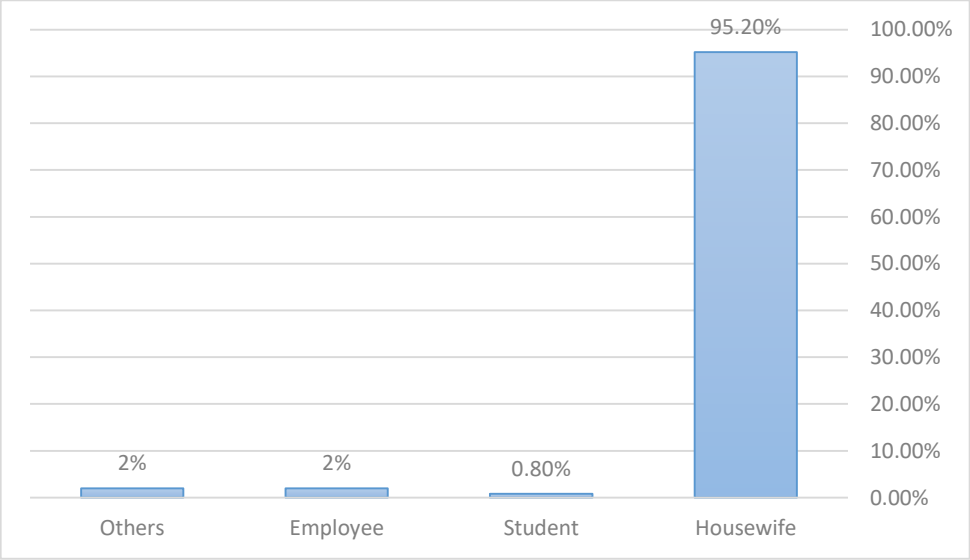
RESULTS

One hundred forty-seven women participated in the study. The mean maternal age was 26.55 ± 6.53 years (age 15-42 years). The median parity was 2 (range 1-6). Thirty-four percent (50 /147 people) of the participants were nulliparous, 34% (50 /147 people) of the participants were primiparous and others were multiparous. The mean gestational age was 39.3 ± 1.28 weeks (range 37-42). For multiparous women, the weight of previous children at the birth was checked. The mean weight for first child was 4,143 ± 1.07 grams, 2,946 ± 5.42 grams for the second child, 2,946 ± 5.71 grams for the third child and 1,680 ± 0.00 grams for fourth child . In this pregnancy, 45.6% of neonates were female and 54.4% were male. Other findings are shown in Table 1 and Graph 1 and 2. The mean actual birth weight of the neonates was 3.2 ± 0.44 kg (range 2-4.7). Eight (5.4%) babies had birth weights of less than 2.5 kg, 132 (89.8%) babies weighed 2.5-3.9 kg and 7 (4.8%) weighed 4.0 kg and more. Actual birth weight was positively correlated with both clinical methods (Johnson's: P = 0.0001, r = 0.73 and Dare's: P = 0.0001, r =0.71) and mother's opinion (P = 0.0001, r = 0.69).

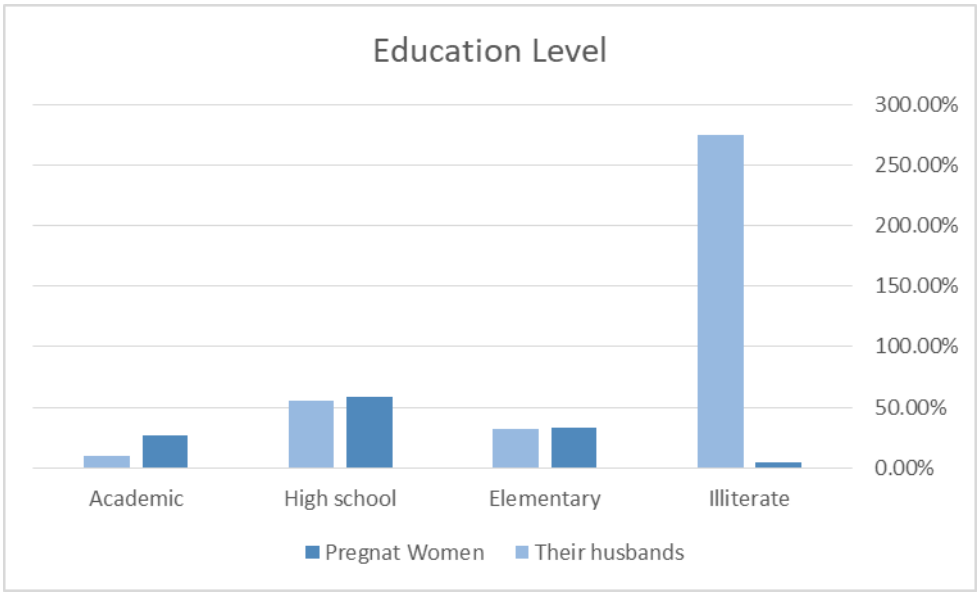
Table 1. **Maternal and infant demographics of 147 pregnancies that underwent fetal weight estimation**

Characteristics	Mean ± SD	Range
Age (y)	26.55 ± 6.53	15 - 42
Parity	2.13 ± 1.10	1 - 6
Gestational age (weeks)	39.46 ± 1.28	37 - 42
Birth weight (g)	3264 ± 442	2000 - 4775
Johnson's formula (g)	3207 ± 464	1860 - 4650
Dare's formula (g)	3308 ± 494	2025 - 4998
Mother's opinion (g)	2851 ± 472	2000 - 4500

SD = standard deviation



Graph 1. **The social status of 147 pregnant women**



Graph 2. **Comparison of education level between pregnant women and their husbands**

Table 2. **A comparison between the accuracy of clinical and ultrasound estimated fetal weights Accuracy and differences between the methods of estimation**

Birth weight category	Mother's opinion	Dare's formula	Johnson's formula	P value
Overall				
Mean percentage error	16.14 ±16.14	14.59 ± 1.78	13.45 ± 1.70	< 0.001*
Mean absolute % error	15.94 ± 11.44	10.62 ± 10.12	9.68 ± 9.41	< 0.001↑
ABW ± 10	51 (34.7%)	86 (58.5%)	97 (66%)	< 0.001‡
< 2.5 Kg				
Mean percentage error	21.06 ± 14.69	25.37 ± 13.63	13.98 ± 15.61	0.072*
Mean absolute % error	14.69 ± 21.06	21.22 ± 15.71	21.06 ± 15.24	1.000↑
ABW ± 10	2 (25%)	1 (12.5%)	2 (25%)	0.779‡
2.5 – 3.9 Kg				
Mean percentage error	14.48 ± 12.20	9.38 ± 1.22	17.08 ± 10.98	< 0.001*
Mean absolute % error	9.55 ± 7.63	15.20 ± 11.21	8.30 ± 7.33	< 0.001↑
ABW ± 10	79 (60.3%)	91 (69.5%)	47 (35.9%)	< 0.001‡
4 Kg <				
Mean percentage error	23.78 ± 8.29	9.92 ± 6.63	12.21 ± 8.64	0.015*
Mean absolute % error	23.87 ± 8.29	10.25 ± 4.81	12.82 ± 7.52	0.050↑
ABW ± 10	4 (57.1%)	2 (28.6%)	4 (57.1%)	0.449‡

RM ANOVA, ↑ Friedman, ‡ Cochran, ABW= Actual Birth Weight*

For all participants, the accuracy and differences between methods of estimation were shown systematically (Table 2). In normal babies (2.5-3.9 kg), the results showed the difference between the three methods and Dare's formula had less % error than other methods. In macrosomic babies (≥ 4.0 kg), the mean % error showed that all methods overestimated the actual birth weight. However, both the mean absolute % error and proportion of estimates within 10% of the actual birth weight for the clinical method were significantly lower than those of the mother's opinion method. Details are shown in Table 2. In LBW babies (< 2.5 Kg), there was no difference between the three methods and at least the results showed that % error for Johnson's formula was less than that obtained by another method.

DISCUSSION

This study used Johnson's and Dare's clinical formulas and the mother's perception of her child's weight to predict the actual fetal birth weight. The present study showed that, considering a maximum error of ± 10% from the actual birth weight, the estimated accuracy of fetal weight for Johnson's, Dare's formulas and mother's personal perception were 66%, 58.5%, and 34.7%, respectively. There were significant differences between all the three groups; however, more accurate results were obtained using Johnson's formula. Johnson and Toshach (1954) accurately estimated fetal weight in 68% of the 200 cases, with ± 10% error in their original research (16). Torloni also showed that just in 61% of the cases there was a 10% difference between the estimated weight obtained with Johnson's formula and the actual fetal birth weight. The reason for this difference can be attributed to the higher prevalence of maternal obesity in the Thorlani's study. Additionally, similar to Torloni's study, Johnson's method was also more accurate than the Dare's formula in determining the actual fetal weight (15). Dare first used this simple formula in 1992 to estimate the weight of 498 fetuses and obtained a good correlation between this method and the actual fetal weights (17). In Torloni's study, 57% of the estimated weights with Dare's formula were similar to the actual weights and this is similar to the result of this study (15). In addition, the mean percentage error and the mean absolute percentage error of Johnson's formula were lower than the other two methods which again indicates the superiority of Johnson's method. Unfortunately, there are few studies on clinical methods of fetal weight estimation and this may be due to the lack of experienced staff or lack of accurate information. Other studies have also confirmed higher accuracy for Johnson's formula in proper fetal weight estimation (16). Galet also compared Johnson's method with ultrasound and reported similar accuracy rates for both methods in fetal weight estimation (18). On the other hand, in a large study on 460 cases, Chauhan compared ultrasound technique with clinical methods, including Johnson's and Dare's methods and observed no significant difference. In addition, Chauhan for the first time published that maternal estimates are as accurate as ultrasound in fetal weight estimation (11). The accuracy of maternal estimates ± 10% in the present study (34.7%) differ from the values previously reported by others, which ranged from 53.5% to 69% (19). It was expected that multiparous mothers had more accurate estimates of fetal weight than nulliparous mothers; however, the difference was not significant in this study. In this study, other factors such as age, education and the weight of previous neonates were studied and none of which related to mother's estimates. Previous studies also confirmed that maternal characteristics did not affect the accuracy of maternal estimates (11, 15, 19).

The highest and the lowest estimated accuracy in this study were related to the weight ranges of 2.5-4 kg and below 2.5 kg, respectively. In the normal weight group, Johnson's formula and Dare's formula, with 8.30 ± 7.33 and 15.20 ± 11.21, had the lowest and the highest mean absolute percentage errors, respectively. This demonstrates why clinical methods are considered suitable for estimating the weight of normal fetuses. Nevertheless, given the small proportion of low birth weight and microsomal neonate in this study, this finding should be interpreted cautiously.

Belete at el. (20) disagreed with this opinion and argued that Johnson's formula was not suitable for estimating the weight of normal fetuses. In the under 2.5 kg weight group, the three groups had low accuracy rates and no significant difference was observed. In a Shittu's study (3), lower accuracy rates were reported for clinical methods in the under 2.5 kg weight group and only 41.7 % of the cases were properly estimated with a 10% error.

Finally, the three methods were significantly different for estimation of weight in the macrosomia group. In the case of overweight groups, all the three methods produced significantly low estimates. However, the Dare's method was more accurate and its mean absolute percentage error was lower than the other two methods. Buchmann (21) also argued that the Dare's method is more accurate in estimating the weight of overweight groups. Faschingbauer and et al. (22) concluded that

accurate estimation of macrosomia is an unsolved problem and clinical methods are conditionally able to estimate the fetus weight and they merely provide a basis for future decisions. In contrast, it was found that Johnson's method was the most accurate clinical method in estimation of overweight groups in another study (23). However, Galet (18) questioned the accuracy of clinical methods in proper fetal weight estimation and Nahar (24) argued that ultrasound is more accurate than clinical methods in actual fetal weight estimation. Each of the two methods used to calculate the percentage error had some limitations; however, their combination with a 10% difference in birth weight enriched the research findings. Additionally, this study was carried out in a hospital which has low generalizability.

CONCLUSION

According to the present study, Johnson's formula produced more accurate estimates, especially for fetuses in the normal weight range. This method is easier than Dare's formula for objective measurements and calculations. It is also more reliable than a mother's perception method and can be easily taught to midwives, less experienced staff, medical students, and physicians. Using modern technologies such as ultrasound for fetal weight estimation requires using expensive equipment, experienced and specialized staff and a lot of time; therefore, utilizing these precise, fast and inexpensive clinical methods can be a good alternative in developing countries. On the other hand, considering the contradictory results mentioned above, it is recommended to use more accurate methods to predict and calculate the weight of fetuses weighing less than 2.5 kg and those above 4 kg; because both macrosomia and low weight groups are associated with increased morbidity and mortality during labor.

Acknowledgment

Authors wish to thank all participants, the University of Torbat Heydariyeh University of Medical Sciences for the approval of this project and financial support of our study. The authors alone are responsible, for the content and writing of the paper.

Conflict of Interests

The authors declare that there is no conflict of interests regarding the publication of this paper.

References

1. Njoku C, Emechebe C, Odusolu P, et al. Determination of Accuracy of Fetal Weight Using Ultrasound and Clinical Fetal Weight Estimations in Calabar South, South Nigeria. Int Sch Res Notices 2014;2014: 970973. https://doi.org/10.1155/2014/970973

2. Bakshi L, Begum HA, Khan Iet al. Comparative Study of Clinical and Sonographic Estimation of Foetal Weight at Term. Mymensingh Med J 2015; 24: 572-7.

3. Shittu AS, Kuti O, Orji EO, et al. Clinical versus sonographic estimation of foetal weight in southwest Nigeria. J Health Popul Nutr 2007;25:14-23.

4. Blencowe H, Cousens S, Chou D, et al. Born too soon: the global epidemiology of 15 million preterm births. Reprod Health. 2013;10 Suppl 1:S2. https://doi.org/10.1186/1742-4755-10-S1-S2

5. Hoopmann M, Abele H, Wagner N, et al. Performance of 36 different weight estimation formulae in fetuses with macrosomia. Fetal Diagn Ther. 2010;27: 204-13. https://doi.org/10.1159/000299475

6. Curti A, Zanello M, De Maggio I, et al. Multivariable evaluation of term birth weight: a comparison between ultrasound biometry and symphysis-fundal height. J Matern Fetal Neonatal Med 2014;27:1328-32. https://doi.org/10.3109/14767058.2013.858241

7. Bell R. Trends in birthweight in the north of England. Hum Fertil (Camb). 2008;11:1-8. https://doi.org/10.1080/14647270701654369

8. Shanmugaraja Y, Kumarasiri SG, Wahalawatte SL, et al. Sri Lankan fetal/ birthweight charts: validation of global reference for fetal weight and birthweight percentiles. Ceylon Med J 2013;58:62-5. https://doi.org/10.4038/cmj.v58i2.5681

9. Ugwu EO, Udealor PC, Dim CC, et al. Accuracy of clinical and ultrasound estimation of fetal weight in predicting actual birth weight in Enugu, Southeastern Nigeria. Niger J Clin Pract 2014;17:270-5. https://doi.org/10.4103/1119-3077.130208

10. Picker RH, Saunders DM. A simple geometric method for determining fetal weight in utero with the compound gray scale ultrasonic scan. Am J Obstet Gynecol 1976;124:493-4. https://doi.org/10.1016/0002-9378(76)90175-7

11. Chauhan SP, Hendrix NW, Magann EF, et al. Limitations of clinical and sonographic estimates of birth weight: experience with 1034 parturients. Obstet Gynecol 1998;91:72-7. https://doi.org/10.1016/S0029-7844(97)00590-5

12. Banerjee K, Mittal S, Kumar S. Clinical vs. ultrasound evaluation of fetal weight. Int J Gynaecol Obstet 2004;86(1):41-3. https://doi.org/10.1016/j.ijgo.2004.03.005

13. Khani S, Ahmad-Shirvani M, Mohseni-Bandpei MA, Mohammadpour-Tahmtan RA. Comparison of abdominal palpation, Johnson's technique and ultrasound in the estimation of fetal weight in Northern Iran. Midwifery 2011;27:99-103. https://doi.org/10.1016/j.midw.2009.10.005

14. Baum JD, Gussman D, Wirth JC, 3rd. Clinical and patient estimation of fetal weight vs. ultrasound estimation. J Reprod Med 2002;47:194-8. https://doi.org/10.1097/00006254-200209000-00007

15. Torloni MR, Sass N, Sato JL, et al. Clinical formulas, mother's opinion and ultrasound in predicting birth weight. Sao Paulo Med J 2008;126:145-9. https://doi.org/10.1590/S1516-31802008000300002

16. Hernandez-Castro F, Laredo-Rodriguez A, Hernandez-Herrera R. Sensitivity and predictive value of the Johnson and Toshach method to estimate fetal weight. Rev Med Inst Mex Seguro Soc 2006;44:309-12.

17. Dare FO, Ademowore AS, Ifaturoti OO, Nganwuchu A. The value of symphysio-fundal height/

abdominal girth measurements in predicting fetal weight. Int J Gynaecol Obstet 1990;31:243-8. https://doi.org/10.1016/0020-7292(90)91018-L

18. Perdriolle-Galet E, Thiebaugeorges O, Lamy C, et al. Fetal weight estimation during labour: comparison of the clinical and ultrasonographic approaches. J Gynecol Obstet Biol Reprod (Paris). 2014;43:593-9. https://doi.org/10.1016/j.jgyn.2013.08.016

19. Diase K, Monga M. Maternal estimates of neonatal birth weight in diabetic patients. South Med J. 2002; 95:92-4. https://doi.org/10.1097/00007611-200295010-00018

20. Belete W, Gaym A. Clinical estimation of fetal weight in low resource settings: comparison of Johnson's formula and the palpation method. Ethiop Med J. 2008;46:37-46.

21. Buchmann E, Tlale K. A simple clinical formula for predicting fetal weight in labour at term--derivation and validation. S Afr Med J 2009;99:457-60.

22. Faschingbauer F, Voigt F, Goecke TW, , et al. Fetal weight estimation in extreme macrosomia (>/= 4,500 g): comparison of 10 formulas. Ultraschall Med 2012; 33:E62-7. https://doi.org/10.1055/s-0031-1281833

23. Sravani CH LKK, Sangeereni M, Lavanya Kumari K. Comparative Study of Fetal Weight Estimation Using Hadlock's and Johnson's Formula and its Correlation with Actual Birth Weight. Int J of Sci c Stud 2014;2:163-70.

24. Nahar N, Akhter N, Hoque MEet al. Comparative study between clinical and sonographic estimation of fetal weight in third trimester of pregnancy and its relationship with actual birth weight. Mymensingh Med J 2008;17:157-63.

Analiza greške pri određivanju tačnosti Johnsonove i Dareove formule i mišljenja majke u određivanju porođajne težine: rezultati iranske studije preseka

Somayeh Alirezaei[1], Elham Azmoude[2], Asma Ghaderi[3]

[1]*Student doktorskih studija u oblasti reproduktivnog zdravlja, Studentski istraživački odbor, Fakultet za sestrinstvo i akušerstvo, Univerzitet medicinskih nauka Mashhad, Mashhad, Iran*
[2]*Departman za akušerstvo, Fakultet za sestrinstvo i akušerstvo, Univerzitet medicinskih nauka Torbat Heydariyeh, Torbat Heydariyeh, Iran*
[3]*Studentski istraživački odbor, Univerzitet medicinskih nauka Torbat Heydariyeh, Torbat Heydariyeh, Iran*

SAŽETAK

Tačno određivanje težine deteta je veoma važno za porođaj. Prema dostupnoj literaturi, nijedna od poznatih tehnika nije superiorna u odnosu na druge. Cilj ove studije bio je poređenje analize greške pri određivanju tačnosti Johnsonove i Dareove formule i mišljenja majke za procenu težine deteta na rođenju. Studija preseka je uključila 147 cefaličnih trudnoća u terminu. Zabeležena je procena majke, a za izračunavanje težine fetusa korišćene su Johnsonova i Dareova formula. Tačnost je izračunata pomoću procentualne greške, apsolutne procentualne greške i proporcije procena u okviru 10% realne težine deteta. Statistička analiza je urađena primenom RM ANOVA, Fridmanovim i Kohranovim testom; $p < 0,05$ označavalo je statističku značajnost. Porođajna težina je tačno određena u 34,7%, 58,5%, 66% slučajeva, koristeći procenu majke, kao i Johnsonovu i Dareovu formulu. Proporcija između procene majke i Dareove formule je bila značajno niža od proporcije između procene majke i Johnsonove formule za sve porođajne težine. Nije zabeležena značajna razlika u merama tačnosti za male porođajne težine. Srednja vrednost greške Johnsonove formule i u grupi sa normalnom težinom i u makrozomskoj grupi bila je niža od Dareove formule i procene majke.

Johnsonova formula je tačnija u proceni realne porođajne težine nego Dareova formula i procena majke. U opsegu normalne težine, Johnsonova formula je tačnija, dok je Dareova formula bila tačnija u makrozomskoj grupi.

Ključne reči: **težina fetusa, porođajna težina, Iran**