

Informativity of perinatal medical card in fetal growth assessment

*Eugenia Bogonovschi, MD, Undergraduate Student; Ion Bologan, MD, PhD, Associate Professor

Department of Obstetrics and Gynecology No 1, Nicolae Testemitsanu State University of Medicine and Pharmacy
Chisinau, the Republic of Moldova

*Corresponding author: bogonovschi.eugenia@gmail.com

Manuscript received January 21, 2019; revised manuscript March 04, 2019

Abstract

Background: Failure to provide antenatal information for pregnant women as well as to complete the perinatal medical records at each visit may have negative effects on the child development.

Material and methods: A retrospective documentary review study was carried out, which included 100 women of fertile age. The questionnaire included 80 questions within the following rubrics: personal information about the patient, obstetrical-gynecological medical history, and perinatal medical card.

Results: The patients were divided into the following age groups <20 years – 10 patients (10.0%), 20-30 years – 67 patients (67.0%), 31-40 years – 21 patients (21.0%) and > 40 years – 2 patients (2.0%). The recommended weight gain range is ≤ 12 kg, whereas 59 patients (59%) reported the highest weight gain ≥ 20 kg and others showed a mean range of 12-20 kg. The assessment of parity's effects on fetal weight proved that multiparous women give birth to heavyweight newborns. Women in their second pregnancies make up 62%. Vaginal and cesarean births were registered in 88% and 12% of cases, respectively. Spontaneous abortions were reported in 20%, abortions on demand – 21%, and premature births in 5% of cases. The perinatal medical records were fully completed in 49.0% and partially – in 51.0% of cases.

Conclusions: The amount of perinatal medical card fulfillment has reached the lowest level, including the "gravidogram" that refers to the fetal growth charts.

Key words: gravidogram, fetal biometrics, perinatal medical card.

Introduction

Pregnancy is a normal, natural and healthy phenomenon in a woman's life. Both the pregnant woman and her family are responsible for her physical and emotional condition [1, 2, 3, 4]. The routine prenatal care may include a series of interventions designed to ensure an optimal fetal development. Pregnant women are provided with screening, prophylaxis and counseling. The medical care provided to the pregnant woman and her fetus throughout pregnancy is essential to prevent the early occurrence of any circumstances that might affect pregnancy outcomes so that they can be treated and monitored.

A mandatory standard for antenatal care is the Perinatal Medical Card (Form 113 / e), approved by Order of the Ministry of Health of the Republic of Moldova No 828, dated of 2011 October 31, that refers to "the approval of the Primary Medical Record Forms" [3, 4, 5]. The perinatal medical card is an evidence-based record book that is provided free of charge in the first prenatal visit [2, 3, 4]. The perinatal medical card is fulfilled by the family doctor or an obstetrician-gynecologist. The pregnant woman keeps the perinatal medical card that will be completed at each medical check-up throughout the entire gestational period [5, 6, 7, 8]. Therefore, the proper assessment of the fetal intrauterine growth is crucial for antenatal care. Fundal height measurement (FHM) has a medium diagnostic value in specifying fetuses of a small gestational age (SGA). The steady recording of FHM on the gravidogram increases the sensitivity and specificity of the method [5, 6, 9]. Ultrasound biometry is indicated in case of a suspected intra-

uterine growth restriction (IUGR), based on both FHM and gravidogram. Thus, the ultrasound parameters for diagnosis of IUGR are as follows: bi-parietal diameter (BPD), cranial circumference (CC), abdominal circumference (AC), and femoral length (FL). AC is the most advanced parameter in detecting IUGR of the fetus with a sensitivity of 61% and a specificity of 95%. FL is a prognostic indicator in severe cases of intrauterine growth restriction of vascular origin [5, 6, 7]. Each pregnant woman will undergo three ultrasound scans: at 12-14 weeks, 18-22 weeks, and 30-32 weeks [8]. Due to these examinations, the necessary ultrasound parameters for fetal development can be assessed within the given gestational term [5, 6, 7, 8]. A dynamic image ultrasonography of the fetal biometric parameters will be carried out additionally, in case if deviation from normal physical growth is recorded throughout the pregnancy and during the mandatory visits [10, 11]. This may precisely determine failure of a fetus to reach its pre-determined growth potential due to insufficient kinetics of intrauterine growth or abnormality resulting from the maternal-fetal disorders [12].

Preconception care is of great importance since it determines both the pregnancy outcomes and the health of the future child [10, 11]. It has been recognized that constant monitoring of physiological changes during pregnancy helps to prevent complications by early detection and emergency treatment, which are essential for maintenance of the pregnancy as a normal physiological process [13].

The purpose of this study is to assess fetal growth by using standardized fetal growth charts related to the gestational age, as well as the study results via FHM and fetal biometric parameters from ultrasound data.

Material and methods

A retrospective documentary study was designed and conducted on 100 women of childbearing age who were recruited from the patients in the postpartum period (2-12 days after birth) and admitted within the Department of Obstetrics No 1 and No 2 in the Municipal Clinical Hospital No 1, from March to July 2018. The questionnaire was impersonal and did not include any rubrics of personal information.

The questionnaire included 80 questions and was structured according to the following rubrics: patient personal data, obstetrical-gynecological anamnesis, perinatal medical cards. Simultaneously, 12 patients with ultrasound results were interviewed, of which only 5 patients presented the fetal biometric parameters assessed during the three antenatal mandatory visits: (BPD, CC, AC, FL) and the estimated fetal weight (EFW) at birth.

Primary data have been processed via Excel (from Microsoft Office 2010).

Results and discussion

According to their age, patients were divided into the following age groups: <20 years – 10 patients (10.0%), 20-30 years – 67 patients (67.0%), 31-40 years – 21 patients (21.0%) and > 40 years – 2 patients (2.0%), (fig. 1).

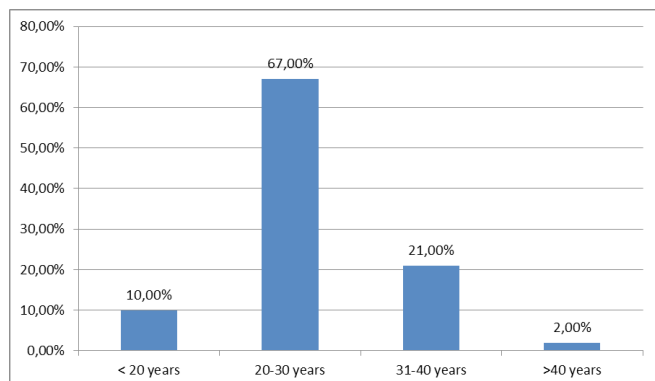


Fig. 1. Distribution of patients into age groups (%).

The distribution of interviewees according to the place of residence is as follows: 76 patients (76.0%) came from urban areas and 24 patients (24.0%) – from rural areas.

Twenty patients (20.0%) were reported to have a previous early miscarriage in anamnesis, 4 patients (4.0%) – late spontaneous abortion, and 5 cases (5.0%) resulted in premature death. Previous abortions on demand were also considered within the study. It should be noted that 21.0% of patients presented a history of abortions on demand (fig. 2).

The present study reported a weight gain within the recommended range (≤ 12 kg) in 14 patients (14.0%), an increased weight gain between 12 -20 kg was found in 27 patients (27.0%) and an overweight ≥ 20 kg – in 59 patients (59.0%), (fig. 3).

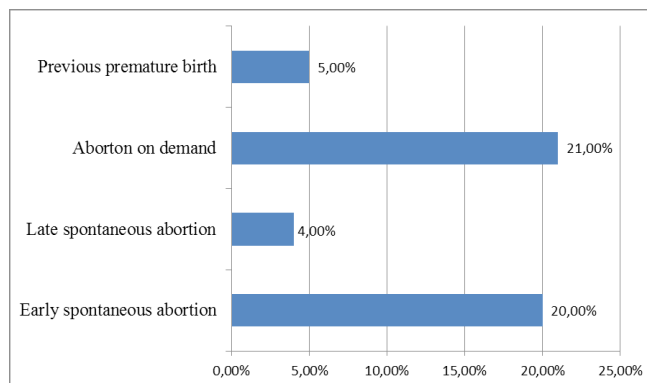


Fig. 2. The most common obstetrical complications in patients (%).

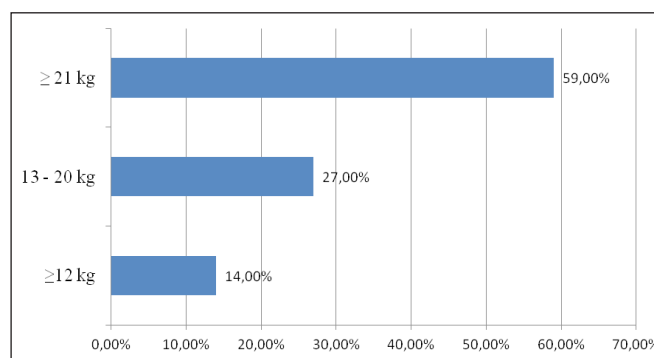


Fig. 3. The weight gain of the patients included in the study during the current pregnancy (%).

Most of the clinical studies that assessed the impact of parity on fetal weight have concluded that multiparous women give birth to heavier weight fetuses. Based on the research, we determined that 34 women were at their first birth (34.0%), 62 women were in their secondary pregnancy (62.0%), and the lowest rate was registered in multiparous women – 4 cases (4.0%), (fig. 4).

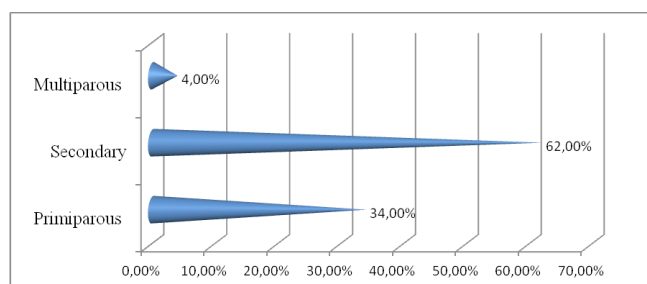


Fig. 4. Influence of parity on fetal weight (%).

According to the study, 88 cases resulted in natural birth and 12 women (12.0%) underwent caesarean section. Assessment of pregnancy term deliveries showed 89 (89.0%) full-term pregnancies, 6 cases (6.0%) resulted in premature childbirth and 5 cases (5.0%) reported birth at the gestational age of 41-42 weeks (fig. 5).

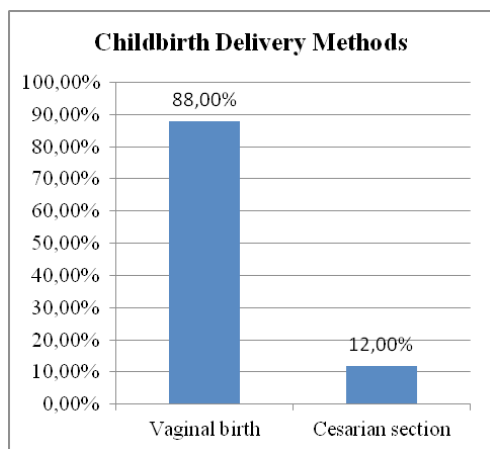
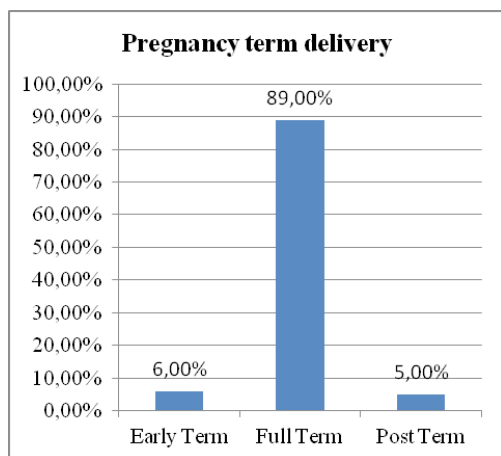


Fig. 5. The delivery term and types of childbirth (%).

The increase of the gestational age may increase both the mass index (MI) and the birth weight [14]. Studies of the fetal birth weight showed the highest rate in 84 (84.0%) newborns with the weight ranging from 2800 g – 3999 g, whereas 9 cases (9.0%) reported a fetal weight greater than 4000 g and 7 cases (7.0%) had less than 2800g at birth (fig. 6).

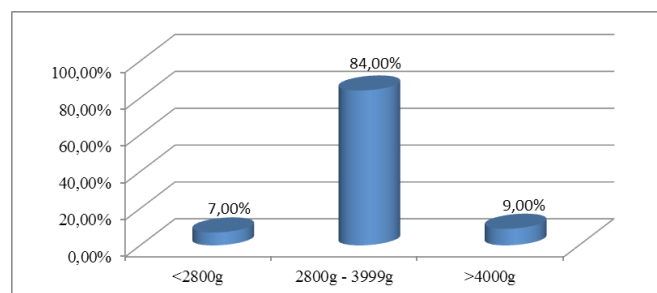


Fig. 6. Fetal birth weight (%).

The perinatal medical card is a mechanism for recording information related to antenatal follow-up and deliveries [15]. According to the amount of the perinatal medical card fulfillment, we found that 49.0% were satisfactorily fulfilled and 51.0% of them were partially or unsatisfactorily filled (tab. 1).

Table 1

The fulfillment of the gravidogram based on the perinatal medical cards used in the study

Gravidogram	Fulfillment of the gravidogram based on the perinatal medical cards	
	Absolute value	Percentage
Complete	85	85.0%
Incomplete	15	15.0%

The Ministry of Health recommends to carry out 6 antenatal care visits during pregnancy, of which 2 are standard visits to the obstetrician-gynecologist. It should be noted that WHO recommends at least 4 antenatal care visits for a normal pregnancy [2, 3, 15].

Table 2 shows the number of visits during pregnancy. It has been determined that most patients – 62 cases (62.0%) reported to have 6 antenatal visits, 26 patients (26.0%) – 5 visits, 10 patients (10.0%) – 4 visits and 2 patients (2.0%) – 3 visits (tab. 2).

Table 2

Number of antenatal care visits

Number of antenatal care visits	Absolute value	Percentage
1 visit	-	-
2 visits	-	-
3 visits	2	2.0%
4 visits	10	10.0%
5 visits	26	26.0%
6 visits	62	62.0%

Proper assessment of the fetal intrauterine growth is the key task of the antenatal care [16, 17]. UFH measurement has a diagnostic value in predicting the fetal weight. It is essential to determine the gestational age and identify the abnormal growth rates in pregnant women since these may lead to a reduced infant mortality rate. The gestational age is assessed by using clinical criteria such as uterus size measurement, data regarding the last menstrual period, or ultrasound criteria. The last menstrual period data exhibits a rather high degree of errors since some pregnant women do not remember exactly the time of the last menstrual period or it did not last for 28 days in all cases. UFH shows a low net value since it can erroneously influence the height of the pregnant woman, some abdominal tumors or uterine fibromas [9]. Therefore, the ultrasound indices are still the most relevant ones [13, 16, 17]. The estimated fetal weight in relation to pregnancy term and actual birth weight was difficult to assess due to the lack / incomplete recording of all ultrasound data (BPD, CC, AC, FL) in the perinatal medical book.

The estimated fetal weight in relation to the clinical parameters of UFH and the abdominal circumference (AC) during 36-38 weeks of gestation according to the Iakubov formula: $(UFH + AC) / 4 * 100$ has also been considered.

This calculation formula has shown higher veracity than other formulas within a national study [9].

The estimated intrauterine weight of the fetus was as-

sessed only in 5 cases, which included the ultrasound parameters evaluated at mandatory antenatal visits and recorded in the medical record cards of these patients. Thus, the intrauterine growth charts were carried out individually for each case, whilst fetal growth assessment was related to 10-90 percentiles. In three cases out of five, the intrauterine weight was found within the 10-90th percentile in relation to the newborn's weight. The ultrasound is considered the method of choice in the diagnosis of fetal IUGR, having a specificity of 80-90%. However, ultrasonography also monitors the intrauterine growth process and allows the assessment of a growth abnormality and its degree of severity. Fetal IUGR is characterized by decreased parameters that define the process of intrauterine development of the fetus (the weight, waist, skull circumference, abdominal, thoracic, subcutaneous tissue and muscular mass). The estimated ultrasound parameters which provide the diagnosis IUGR of the fetus are as following: BPD CC, AC, and FL. Referring to fetal IUGR, the optimal assessment of the individual intrauterine growth rate is being considered, as well as both the mean fetal weight (MFW) at birth and the maternal factor. Therefore, two successive ultrasound examinations within about 14 days apart should be performed for the purpose of a reliable assessment of fetal growth dynamics [13, 16, 17].

The ultrasonic fetal cephalometry that is consecutively performed by assessing BPD (sensitivity – 89% and positive prognosis – 68%) and CC (sensitivity – 63% and positive prognosis-75%) is useful not only for detecting the risk of developing IUGR in fetuses in relation to individual intrauterine growth potential, but it also helps to differentiate between the symmetrical forms of the disease and asymmetrical ones (the method is sensitive in 94% of cases of symmetrical forms and 42% for the asymmetrical ones). Thus, the assessment was not properly performed due to the lack of ultrasound data, which should have been included within the specific rubric of the perinatal medical card.

Conclusions

1. The present study proved that the perinatal medical cards were satisfactorily completed in 49.0% of cases, and partially or unsatisfactorily fulfilled in 51.0% of cases.

2. Based on the study, we found that the pregnancy was completed at 37-40 weeks of gestation in 89 cases (89.0%), whereas the fetal weight ranged from 2800 g – 3999g in 84 cases (84.0%), greater than 4000 g in 9 cases (9.0%) and less than 2800 g in 7 cases (7.0%).

3. The gravidogram was satisfactorily fulfilled in 85.0% of cases within the current study.

4. It has been determined that the accuracy of the fetal weight according to the Iakubov formula made up 49.93%, thus allowing to identify indices under the 10th percentile and the 90th percentile for the gestational age in 30.61% of cases.

5. The study results proved the necessity of interpreting the perinatal fetal weight by using the ultrasound indices and their recording within individualized growth charts. The ul-

trasound examination should be integrated into the clinical context and for each case apart, as well as the population-specific growth curves should be thoroughly considered.

References

1. Centrul National de Studii pentru Medicina Familiei. Ingrijiri prenatale in sarcina cu risc scazut. Ghid de practica pentru medicul de familie [Routine prenatal care in low-risk pregnancies. Family Practice guidelines]. Bucharest: InfoMedica; 2005. p. 18. Romanian.
2. Stratulat P, Curteanu A. Fortificarea sistemului asistentei serviciilor perinatale de calitate [Enhancement of the quality perinatal-assisted care system]. Buletinul Academiei de Ştiinţe a Moldovei. Ştiinţe Medicale [Bulletin of the Academy of Sciences of Moldova. Medical Sciences]. 2007;(2/11):244-255. Romanian.
3. Principii de organizare şi acordare a asistentei perinatale: Ghidul A Naţional de Perinatologie [Principles of organization and perinatal care assistance: National Guidelines for Perinatal Care]. 2nd ed. Chisinau; 2006. 165 p. Romanian.
4. [Ministry of Health of the Republic of Moldova]. [Order no. 828 of 2011 October 31, on the approval of the Primary Medical Forms]. [cited 2018 Aug 9]. Available from: http://old2.ms.gov.md/sites/default/files/legislatie/ordinul_nr_828_din_31.10.2011.pdf. Romanian.
5. [National Center for Health Management of the Republic of Moldova]. [Record forms] [cited 2018 Aug 9]. Available from: <http://www.cnms.md>. Romanian.
6. Rusu C, Streteanu A. Ultrasound diagnosis of fetal macrosomia. Acta Medica Transilvanica. 2012;2(2):225-228.
7. Stratulat P, Curteanu A, Carauş T. Experienţa utilizării curbelor individualizate de creştere intrauterină a fătului pentru diagnosticul problemelor de creştere fetală [The experience of using individualized intrauterine growth charts for the diagnosis of fetal growth disorders]. Buletinul Academiei de Ştiinţe a Moldovei. Ştiinţe Medicale [Bulletin of the Academy of Sciences of Moldova. Medical Sciences]. 2009;(1/20):235-240. Romanian.
8. National Institute for Clinical Excellence. Antenatal care: routine care for the healthy pregnant woman. London: NICE; 2003. (NICE Clinical Guideline, no. 6).
9. Corolcova N, Alaeldin M, Rusu C, Raetcaea V. Caracteristica comparativa a metodelor de calcul a masei probabile a fatului [Comparative characteristics of methods of calculating the estimated fetal weight]. Scientific Annals of the Nicolae Testemitsanu State University of Medicine and Pharmacy (Chisinau). 2008;9(5):37-40. Romanian.
10. [Ministry of Health of Romania, Romanian Association of Neonatology]. Determinarea vârstei de gestaţie la nou-născut [Determining the Age of Gestation in the Newborn]. Bucharest; 2011. 16 p. (Clinical Guide Collection for Neonatology, 01). Romanian.
11. Copilul.ro [Internet]. Bucharest; c2004-2019 [cited 2018 Aug 10]. [The length and weight of the fetus every week of pregnancy]. Available from: <https://www.copilul.ro/sarcina/despre-sarcina/Lungimea-si-greutatea-fatului-in-fiecare-saptamana-de-sarcina-a11386.html>. Romanian.
12. Alexander GR, Himes JH, Kaufman RB, Mor J, Kogan M. United States national reference for fetal growth. Obstet Gynecol. 1996;87(2):163-8.
13. Kiserud T, Piaggio G, Carroli G, Widmer M, Carvalho J, et al. WHO Fetal growth charts: a multinational longitudinal study of ultrasound biometric measurements and estimated fetal weight. PLOS Medicine. 2017;14(3): e1002284. doi:10.1371/journal.pmed.1002220.
14. Goldstein RF, et al. Association of gestational weight with maternal and infant outcomes: a systematic review and meta-analysis. JAMA. 2017;317(21):2207-2225.
15. Bologan I, et al. The impact of the perinatal medical card within the perinatal care service. In: [Proceedings of the 5th Congress of Obstetrics and Gynecology, with international participation; 2010 Oct 7-8; Chisinau, Republic of Moldova]. Chisinau: Ericon; 2010. p. 8-11.
16. Tucker J, Parry G, Fowlie PW, McGuire W. Organisation and delivery of perinatal services. BMJ. 2004;329(7468):730-732.
17. Gardosi J, Francis A. Controlled trial of fundal height measurement plotted on customised antenatal growth charts. Br J Obstet Gynaecol. 1999;106(4):309-17.