



Online Brazilian Journal of Nursing

E-ISSN: 1676-4285

objn@enf.uff.br

Universidade Federal Fluminense
Brasil

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Online Brazilian Journal of Nursing, vol. 12, núm. 4, 2013, pp. 813-822

Universidade Federal Fluminense

Rio de Janeiro, Brasil

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Knowledge about laboratorial routine requested by professionals in Basic Care: a descriptive study

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ABSTRACT

Aim: To evaluate the knowledge and interpretation of laboratorial routine requests by professionals working in pre-natal care in the basic health network.

Method: This is an evaluative study performed between September 2010 and February 2011, based on interviews with 15 doctors and 14 nurses.

Result: 100% of the professionals understood which laboratorial exams should be requested. On the other hand, the interpretation of these exams was not satisfactory in relation to: incorrect standards for glycemia and hemoglobin levels; erroneous interpretation and conduct regarding Rh negative and positivity in VDRL, anti-HIV, HBsAg and toxoplasmosis.

Discussion: The findings of this study are disturbing; excellence in pre-natal assistance depends on both the request for exams and the quality of consultations, enabling opportunistic interventions, to improve the pregnancy outcome.

Conclusion: The interpretation of basic exams of the Program in Humanization of Pre-natal and Birth is an important point of fragility and rupture in pre-natal care in the municipality of Rio Grande, Brazil.

Descriptors: Prenatal Care; Quality of Health Care; Health Evaluation

INTRODUCTION

Pre-natal care is a set procedure that aims to prevent, diagnose and treat undesired events in pregnancy, labor and the newborn. The lack and/or deficiency of this health service is related to higher levels of maternal and perinatal morbidity^(1,2). In this care service some factors are indispensable: the organization of the service, the continued education of the professionals and the use of appropriate and available resources. These guarantee an integral attention and the basic requirements to promote and prevent the most important affections⁽³⁾.

In order to organize and define pre-natal care the Brazilian Ministry of Health (MS, in Portuguese) created the Program in Humanization of Pre-Natal and Birth (PHPN, in Portuguese)⁽¹⁾ in 2000. This states that during the first consultation the following exams must be requested: dosage of hemoglobin and hematocrits (Hb/Ht); blood group and Rh factor; serology for syphilis (VDRL); fasting glucose; urinalysis (Type I); serology anti-HIV and serology for toxoplasmosis (IgG and IgM, whenever possible). These exams must be repeated near the 30th week and serology for Hepatitis B (HBsAg) must be included. In addition, this manual presents the conduct recommended based on the results found in the mentioned exams.

According to the MS the quality of pre-natal care is compromised because there is a high index of congenital syphilis in Brazil, an estimate of 12 cases/1,000 born alive, as seen in the Brazilian Unified Health System (SUS, in Portuguese)⁽⁴⁾. Syphilis, if diagnosed in the early stages, is an easy disease to treat without any later consequences. This indicates a lack in the theoretical-practical structure of the professionals responsible for pre-natal care and their deficient education. Besides the technological developments in contemporary medicine, it

seems an anachronistic fact that a disease that presents a well-defined etiological agent, a known means of transmission, a long period of incubation and treatments with excellent levels of cure, still generates new cases^(1,5).

Therefore, we decided to study the laboratorial exams requested by health professionals, as the importance of such proceedings to perform an effective pre-natal care is not in question. The use of opportune interventions during the whole pregnancy, either preventive or therapeutic ones, aim to provide assistance to the pregnant woman in all levels of complexity of the health system^(1,6). Besides that, many studies call attention to the importance of understanding with regard to laboratorial exams and their interpretation as a response in pre-natal care services^(1,2,3,6-9).

Some studies deal with the evaluation of the quality of services, but the majority only describe the indicators, such as coverage, the number of pre-natal care consultations and the number of labors performed^(2,3,7-9). There is significant marginalization about the evaluation of the minimal understanding needed by the professionals involved in pre-natal care, and as a consequence, the effective results achieved because of the actions taken based on the pre-natal routine, aiming to evaluate the information and the interpretation of laboratorial routines described in the PHPN by pre-natal professionals in the basic health public network.

METHODOLOGY

This is a descriptive study, done in the municipality of Rio Grande, located in the south coastal plains of the Brazilian state of Rio Grande do Sul, in which the public health system is composed of 32 basic units (UBS, in Portuguese) and two general hospitals. The pre-natal coverage of

the city in the year of 2010 was 95.5%; the SUS was responsible for 60% of these occurrences.

This present study presents a quantitative approach, which is adequate to perform the evaluation of services. The target population was composed of health professionals (doctors and nurses) that work with pre-natal care in the UBS public network of the studied municipality. The care is performed by 22 doctors and 16 nurses, a total of 38 professionals. However, nine professionals, from three UBS, did not participate in this study, therefore our sample comprised 15 doctors and 14 nurses.

In this study we opted to interview doctors and nurses responsible for the pre-natal care in the UBS of the municipality. Rio Grande uses, as a reference, the Technical Manual of Pre-Natal and Puerperal, edited by the Brazilian Ministry of Health⁽¹⁾, in which the competencies of each professional is described and established. As a competence of the nurse and the doctor, this manual states that these two professionals must take turns in pre-natal consultations. They must ask for exams and guidance throughout the treatment, according to technical and operational standards; guide through the pregnant women regarding risk factors; identify risky pregnancies and send them to referral units; perform the collection of cytopathology and update the pregnancy card at every consultation. With regards to the competencies of the pregnant woman, she must carry the current, up to date Pregnancy Card to each consultation. Thus, both the doctor and the nurse can request pre-natal care exams, they must also have full acknowledgement about the conduct that must follow based on the results of the exams.

The information was collected using a wide standardized and pre-codified instrument that contained questions about the understanding of basic routine, according to the setting described in the technical manual of the Brazilian Ministry

of Health, called 'Pre-Natal and Puerperal: Qualified and Humanized Attention' ('Pré-natal e Puerpério: Atenção Qualificada e Humanizada', the original title, in Portuguese), with regards to soliciting and interpreting laboratorial exams and the later conduct based on the results found. The interviews were performed between September 2010 and February 2011 by two medicine students who demonstrated interest in participating in this study. The answers to the questions were considered to be two possibilities: spontaneous or induced. The spontaneous answer was when the interviewer only read the question without mentioning possible alternatives. In the case of induced answer, this option was taken after the individual declared that his spontaneous answer was final, and then the interviewer read alternative answers not previously mentioned by the interviewee.

The training of the students/interviewers was based on the reading of the questionnaire and the instruction manual, the application of the questionnaire in pairs and to the research group. After that a pilot study took place. Quality control was performed through the repetition of 10% of part of the interviews by the coordinator of data collection. Typing the questionnaires was done using the software called Epi-Info 6.04. All questionnaires were transcribed in double by different typists, with later comparison and correction of typing. The descriptive analysis of data was done with SPSS software suite (*PASW Statistics Base Serie*: 10112665).

The protocol for research was submitted and approved by the Ethics in Research Committee in the Area of Health (CEPAS, in Portuguese), at the Rio Grande Federal University, under registry 63/2010. Furthermore, the confidentiality of the data was guaranteed, participation was voluntary and it was possible to leave the study at any time without the need for justification.

RESULTS

Among the 29 professionals interviewed, 86.2% were female, with an average of 43 years old (± 7.8). Regarding their professional background, 51.7% were doctors and 48.3% were nurses, holding their undergraduate diploma for 17 years and working with pre-natal care consultations for 7 years, on average.

Table 1: knowledge about pre-natal exams among professionals of basic health units. Rio Grande, Brazil, 2010-2011

Complete Blood Count^a		(%)
Yes, spontaneous		100
Yes, induced		0
No		0
Blood type and factor Rh^a		
Yes, spontaneous		96.6
Yes, induced		3.4
No		0
Fasting Glucose Test^a		
Yes, spontaneous		100
Yes, induced		0
No		0
Anti-HIV^a		
Yes, spontaneous		100
Yes, induced		0
No		0
VDRL (serology of syphilis)^a		
Yes, spontaneous		100
Yes, induced		0
No		0
HBsAg^a		
Yes, spontaneous		96.6
Yes, induced		3.4
No		0
Common Urine Exam^a		
Yes, spontaneous		100
Yes, induced		0
No		0
Urinalysis^b		
Yes, spontaneous		93.1
Yes, induced		3.9
No		0
Toxoplasmosis IgG^b		
Yes, spontaneous		93.1
Yes, induced		3.9
No		0

Toxoplasmosis IgM^b	
Yes, spontaneous	93.1
Yes, induced	3.9
No	0
Parasitologic of feces^b	
Yes, spontaneous	24.1
Yes, induced	0
No	75.9
Obstetric Ultrasound^b	
Yes, spontaneous	69
Yes, induced	31
No	0

^aMandatory, according to the Brazilian Ministry of Health. Pre-Natal and Puerperal: Qualified and Humanized Care; 2005.

^bSuggested to be done, if possible, according to the Brazilian Ministry of Health. Pre-natal and Puerperal: Qualified and Humanized Care; 2005.

Source: Designed by the authors, 2013

In table 1, it is observed that the understanding regarding laboratorial exams that must be solicited during the consultation is in accordance with the established standards in the PHPN. From the 29 professionals interviewed 100% of them answered correctly and spontaneously about the need to ask for a blood count, fasting blood glucose, anti-HIV, VDRL (syphilis serology) and urinalysis. With regards to blood type, factor Rh and HbsAg, 96.6% responded spontaneously; with regards to the exams of urine culture, toxoplasmosis IgG and IgM, 93.1% also reported spontaneously that they usually ask for them during consultations. When questioned if the feces parasitological exam had to be solicited, 24.1% of the answers were affirmative against 75.1% negative, which is the correct measure to be taken as the PHPN does not consider this type of exam to be obligatory. At the same time, obstetric ultrasound was mentioned spontaneously as obligatory step in pre-natal care by 69% of the interviewed.

Table 2: knowledge about pre-natal exams among professional of basic care units. Rio Grande, Brazil, 2010-2011

Diagnose of anemia	(%)
Hemoglobine <11	82,8
Other answers	17,2
Pregnant woman Rh negative	
Demand indirect Coombs	93,1
No further requests	6,9
Normal Fasting Glucose results	
< 90mg/dl	72,4
Other results	27,6
Syphilis (positive VDRL)	
Correct conduction ^a	13,8
Incorrect conduction	79,3
Does not know	6,9
What to use to trat syphilis	
Penicillin	93,1
Does not know	6,9
With syphilis, need to treat the partner	
Yes	93,2
No	3,4
Does not know	3,4
Conduction of reagent Anti-HIV	
Send to reference service	93,1
Does not know	6,9
Conduction of reagent HBsAg	
Send to reference service	65,6
Vaccine and immunoglobulin to the newborn	10,3
Does not know	24,1
Conduction of reagent Toxoplasmosis IgG and non-reagent IgM	
None	65,6
Send to reference service	20,7
Does not know	13,7
Conduction of reagent Toxoplasmosis IgM	
Treat with spyramicin	6,9
Send to reference service	65,6
None	10,3
Does not know	17,2

Conduction of non-reagent Toxoplasmosis IgG and IgM	
Guidance and repetition of exams	58,7
Send to reference service	10,3
None	20,7
Does not know	10,3
When exams must be repeated	
From 24 to 30 weeks	86,2
More than 31 weeks	13,8

^aIt was considered as the Correct Conduction: Ask for a confirmation test (FTA-Abs); or treat the pregnant woman and her partner. All routines mentioned above are part of the technical manual: Brazilian Ministry of Health. Pre-natal and Puerperal: Qualified and Humanized Care; 2005.

Source: Designed by the authors, 2013

In table 2, the conduct of these professionals is analyzed based on the interpretation of the exams in pre-natal routine. From the 29 professionals interviewed, 82.8% answered that the value found in hemoglobin below 11 is a diagnosis of anemia; 93.1% solicited indirect Coombs in the cases where the pregnant woman was Rh negative; 72.4% responded that measures below 90mg/dl indicate that fasting blood glucose is between the limits of normality.

With regards to the routine used in syphilis, only 13.8% mentioned the correct conduct by using positive VDRL (requiring a confirmatory test (FTA-Abs) or treating the pregnant and the partner); on the other hand, 93.1% reported the use of penicillin to treat syphilis, and 93.2% responded positively about treating both the pregnant women and her sexual partner.

With regards to other serologies, 93.1% send the patients to a referral service unit when there is a case of positive HIV, and 65.6% do the same when HBsAg is positive; 65.6% of these professionals reported no established conduct during the exam for Toxoplasmosis with positive IgG and negative IgM. However, in the presence of positive IgM for toxoplasmosis only a small amount (6.9%) answered that they would treat the pregnant woman with spyramicin. It is im-

portant to note that 27.5% do not know or they simply do not take any action. Furthermore, when the toxoplasmosis IgG and IgM exams are negative only 58.7% of those interviewed answered that they would provide further orientation to the patient and repeat the exams. Based on the period during which the exams must be repeated 86.2% affirmed they must be done between 24 and 30 weeks of pregnancy.

DISCUSSION

The discussion used, as reference material, the PHPN (2005)⁽¹⁾ and the Manual of Pre-Natal: High-risk pregnancy (2010)⁽⁶⁾. One limitation of this study was the denial on the part of some of the professionals (doctors and nurses) to participate in the research; in the end this study had the adherence of 76.3% of all professionals involved in pre-natal care in the UBS of the municipality of Rio Grande.

In this present research the professionals interviewed showed a 100% understanding of the laboratorial routine to be requested in pre-natal care. However, the knowledge and skills to interpret the pre-natal exams and the conduct to be followed based on the results found, demonstrated a certain lack of preparedness on the part of the professionals to provide adequate care. When we evaluate the interpretation of the exams, such as the level of hemoglobin, fasting blood glucose and indirect coombs exams in pregnant women with Rh negative, this can lead to the conclusion that not even the performance of such examinations will lead to a totally correct routine.

Anemia caused by iron deficiency is the most prevailing nutritional deficiency. The limits of reference of hemoglobin are shorter in pregnant women due to physiological hemodilution in pregnancy, being considered anemic if the

levels of hemoglobin are below 11 g/dL. The lack of iron is correlated to the rise in maternal mortality and morbidity, early labor and low weight at birth⁽¹⁰⁾. High prevalence of pregnancy anemia in developing countries, a diet lacking iron and the low cost of iron supplements in comparison to the necessary tests to track anemia in the laboratory, are some of the factors pointed out that justify the implementation of programs of iron supplementation to all pregnant women. Some principal risks of iron deficiency must be taken into consideration; such risks are: increased fatigue, reduction of work performance, cardiovascular stress, reduced resistance to infection and low tolerance to blood loss during labor⁽¹¹⁾. In this present study, 17.2% of the participants stated levels above 11g/dl of hemoglobin as a diagnosis of anemia. This fact can lead to an excessive use of iron, which is related to a possible deleterious effect and teratogenicity⁽¹⁰⁾.

Although all professionals mentioned requesting blood type and factor Rh tests as an obstetric routine 6.9% were not able to associate the presence of Rh negative to the request of indirect coombs. The main cause of alloimmunization maternal-fetal is the lack in the administration of immunoglobulin anti-D. Although the recommendations in relation to prophylaxis with immunoglobulin are public and known, this pathology still affects five in every 1,000 pregnant women. Furthermore, the presence of positive indirect coombs shows an immediate follow up of the pregnant woman in high-risk pre-natal care^(1,6).

The exams to track pregnancy diabetes are normally asked for by those interviewed, which shows that they believe it is important. According to SUS, in Brazil, the prevalence of pregnancy diabetes in women above 20 years old is 7.6%, of which 94% of the cases present only a lower tolerance to glucose and 6% present pre-pregnancy diabetes⁽⁶⁾. Maternal hyper-

glycemia is related to ketoacidosis, higher risk of infections, fetal malformation and macrosomia, surgical labor and respiratory distress syndrome in newborns⁽¹²⁾. According to the Brazilian Ministry of Health all pregnant women, whether or not they carry a risk factor, must perform a blood glucose level test at the beginning of the pregnancy. The tracking is considered positive in pregnancy when the fasting plasmatic glucose level is equal or higher than 85mg/dL and/or there is the presence of any risk factor for pregnancy diabetes. In the absence of risk factors and fasting glucose \leq 85mg/dL it is considered to be negative tracking and the fasting glucose test must be repeated between 24 and 28 weeks of pregnancy⁽⁹⁾. In this research, the dividing standard for negative tracking was 90mg/dl, even though 27.6% of the participants mentioned higher values than the standard taken as a normal glucose state. This implies a smaller amount of test solicitation in the glucose tolerance test during the diabetogenic period, and as a consequence, a smaller number of diagnoses of reduced tolerance to glucose.

Among the routines investigated in this research, the investigation of infections that could be vertically transmitted were those that presented a higher level of incorrect interpretation and conduct by the pre-natal professionals. For example, syphilis, a disease with an easy diagnosis and treatment, but which can lead to a higher level of maternal-fetal morbimortality, presented 86.2% of incorrect answers from the participants, even with a positive VDRL result. Furthermore some professionals (6.8%) reported they did not know if they should treat the partner or not. A similar situation was found in another study which observed that only 21.1% of obstetricians presented an adequate basic understanding with regards to the interpretation of syphilis exams⁽⁵⁾. In Brazil, the higher prevalence of syphilis in parturients is found in 1.6%, which

is four times higher than HIV infection. In 2005, around 50 thousand pregnant women were infected, an estimate of 12 thousand cases of congenital syphilis. In 2009, the highest proportion of cases of congenital syphilis occurred in children whose mothers had complete pre-natal care (75.5%). Among the pregnant women that had pre-natal care 55.4% were diagnosed with syphilis during pregnancy, and among those 53.7% did not have their partners treated. This situation has worsened and it is considered a clear benchmark of the quality of pre-natal care in Brazil⁽⁴⁾.

In the country it is estimated that 0.4% of the pregnant women are HIV seropositive, which can be translated into 12,635 pregnant or parturients with HIV/children exposed, per year⁽⁴⁾. The higher number of cases of HIV vertical transmission (around 65%) occurs during labor, and the other 35% happened intra-uterus, especially during the last weeks of pregnancy, with an additional risk of post-partum transmission through breastfeeding. The rate of HIV vertical transmission without any intervention is around 25.5%. However, many studies show a reduction of HIV vertical transmission for levels between 0% and 2% through the use of preventive interventions, such as: the use of combined antiretrovirals, labor by elective cesarean section for patients with unknown viral load, or with load above 1,000 copies, the use of AZT by the parturient and by the newborn and the denial of breastfeeding⁽¹³⁾. In our research, we identified that there are still some professionals (6.9%) who, when dealing with a positive HIV result, do not know the correct conduct. In the city of Rio Grande there is a referral service in pre-natal care to HIV pregnant women, which until the end of this study was mentioned by all health professionals. It is therefore concerning that HIV infection procedures are ignored by the health managers, based on the fact that some professionals do not

know how to proceed with a pregnant woman with a positive HIV result, due to the magnitude and importance of the infection.

With regards to the test for hepatitis type B, 24.1% of the interviewed professionals did not know how to proceed with the reacting HBsAg test, despite the fact that the municipality of Rio Grande has an available vaccine and immunoglobulin to be used during the first 12 hours of birth. The Brazilian National Program of Immunization indicates the use of vaccine against hepatitis type B after the first trimester of pregnancy, for women that present negative serology. Therefore, there is a clear obligation to perform the triage of hepatitis type B during pre-natal care. This strategy aims to contribute to the reduction of vertical transmission of hepatitis B, and the tendency to chronicity (from 70% to 90%) that occurs during the contamination at an early age⁽¹⁴⁾. Another important step to prevent vertical transmission of hepatitis type B is the use of vaccine and immunoglobulin in newborns with positive HBsAg mothers. Such measures can reduce the transmission in up to 95% of the cases^(1,6). Hence, the information found in this research is surprising, as it reflects the lack of information and communication among pre-natal professionals and health managers, besides indicating a flaw in the process of the education of these professionals.

Another infection investigated in this study was toxoplasmosis, which besides not being part of the mandatory routine in pre-natal care⁽¹⁾, is still included in the routine of the municipality, as the Brazilian state of Rio Grande do Sul presented a high prevalence of this disease. Studies performed in the state's capital, Porto Alegre, showed a prevalence of between 38% and 40% of pregnant women with negative IgG and IgM, therefore, with a vertical contagious and transmission risk. In these studies the acute infection rate during pregnancy was of 2.4% and 2.6%^(15,16).

Toxoplasmosis can cause natural abortion, retarded intrauterine growth, fetal death, prematurity and malformation; it is therefore fundamental to prevent this disease^(1,6).

The prevention of toxoplasmosis must be done through the education of the pregnant women with negative IgG and IgM about the means of transmission of the disease. They should be aware of: the non-indigestion of raw meat (especially pork and embedded food), the prohibition to get close to cats (especially kittens), and when working with the soil the pregnant must wear gloves^(1,6). According to the data in this research only 58.7% of the participants mentioned that they would suggest the pregnant women underwent a toxoplasmosis exam for negative IgG and IgM, and explained the types of transmission of the disease. Furthermore, 27.5% of those interviewed did not know which steps to take based on a reagent IgM toxoplasmosis result. We must say that pre-natal care professionals in this city, besides not planning effectively for the prevention of toxoplasmosis, do not know how to treat when the illness is in place.

When asked about urinalysis and urine culture, all professionals mentioned that they request these tests. This may be because urinary infection is the most common problem during pregnancy, affecting from 16% to 20% of the pregnant women⁽⁶⁾. We highlight that, although urine culture is not part of the mandatory routine described by the MS, it is the only way to diagnose asymptomatic bacteriuria, which may lead to pyelonephritis and preterm labor.

Both the WHO⁽¹⁷⁾ and the Brazilian Ministry of Health⁽¹⁾ do not preconize ultrasound exam as part of pre-natal routine care, however, in this study a clear prioritization of obstetric echography was noted. There is scientific evidence that the early use of ultrasound during pregnancy provides more precise determination of gestational age, early detection of multiple preg-

nancies and fetal malformation, not detected clinically^(6,18,19). However, other studies confirm that the use of ultrasound as a routine in low-risk pregnant women and after the second trimester does not present evidence that impacts on neonatal mortality and morbidity^(18,19). It is important to mention that ultrasound is an exam desired by pregnant women, and the pre-natal professionals frequently request the test as the result of pressure from the patients.

The professionals demonstrated lack of information in relation to the stage to perform the second laboratorial routine during pre-natal care. According to the MS, the exams must be requested again during the 28th week of pregnancy. To facilitate the correct answers this research considered as correct any indication between the 24th to the 30th week, but only 86.2% of the answers were between this margin of error.

The findings of this study are worrying as excellence in pre-natal care depends both on the quantitative criteria of requests for exams and the quality of the content of consultations, in order to permit more opportune interventions, so that maternal and neonatal outcomes are adequate⁽²⁰⁾.

CONCLUSION

We conclude that the interpretation of basic exams in the PHPN is an important weak point in pre-natal care assistance in the municipality of Rio Grande. The fact that the pregnant woman is present at all proposed consultations and is available to perform all the requested exams does not mean that these tests will be properly evaluated, because this depends on the conduct of the professional. To guarantee the understanding of the professional, and especially, how is it being applied in practice.

The biggest challenge to evaluation of the quality in pre-natal care, focusing on the

professionals and their possible mistakes (and not in medical records or pregnancy cards), is transferring to these professionals the responsibility to be the main influencing factor in the relationship between illness and health, for both the pregnant woman and the child, different from the economical or cultural conditions of the pregnant woman. Therefore, it is important to educate all professionals involved, both doctors and nurses, in a timely manner, especially making the technical information about what is standardized by the MS become part of their daily routines.

The data obtained in this study can support the planning of interventions and the decision-making processes linked to the improvement of quality in pre-natal care in the municipality's service network. Such a proposition can contribute to the reduction of maternal and perinatal mortality, considered a sensible indicator of the adequacy in obstetric and neonatal assistance, and the impact of intervention programs in this area, due to the narrow relationship that it has with the service provided to the pregnant woman and to the newborn.

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Received: 06/11/2012

Revised: 06/08/2013

Approved: 03/09/2013