Screening for infectious diseases in prenatal and childbirth: quality assessment in the municipality of Manaus, Amazonas

Rastreamento das doenças infecciosas no pré-natal e parto: avaliação da qualidade no município de Manaus, Amazonas

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ABSTRACT
During pregnancy until delivery, several complications may occur, causing in some situations its interruption before the expected outcome. Tracking and dealing with these complications in a timely manner contributes to reducing the morbidity and mortality of the mother-child binomial. This study aimed to evaluate the quality of childbirth care in the public network in the city of Manaus, using as indicators the active search, the timeliness of diagnosis and the management of infectious diseases with mandatory coverage. This was a cross-sectional study with a sample of 390 women in the immediate puerperium admitted to maternity hospitals from June to July 2015. Indicators were used to evaluate the conduct in the search, diagnosis, treatment and follow-up of five infectious diseases. Among the 390 puerperal women interviewed, the exams in the maternity hospital for screening for syphilis and HIV and hepatitis B, had a frequency of 98.2% and 99.7%, respectively, being considered regular, the one for hepatitis B was 26.2 %, being considered unsatisfactory. The observed prevalences were 3.4% for syphilis infection; 0.4 of HIV. Hepatitis B samples were negative. We observed a frequency of 81.3% and 0.8% of prenatal exams for toxoplasmosis and malaria, respectively, but there was no positivity. The study showed limitations of childbirth care provided in maternity hospitals, among them, failures in delivery and birth care, as well as competence to obtain quality care.

Keywords: evaluation of the quality of health care, delivery assistance, infectious diseases, complications of labor, maternal mortality.
RESUMO
Durante a gravidez até o parto, podem ocorrer várias complicações, ocasionando em algumas situações a sua interrupção antes do desfecho esperado. O rastreamento e as condutas dessas complicações em tempo oportuno contribuem para a redução da morbimortalidade do binômio mãe-filho. Este estudo teve como objetivo avaliar a qualidade da atenção ao parto na rede pública do Município de Manaus, usando como indicadores a busca ativa, a oportunidade do diagnóstico e a conduta as doenças infecciosas de obrigatória cobertura. Tratou-se de um estudo transversal com uma amostra 390 mulheres em puerpério imediato internadas nas maternidades no período de junho a julho de 2015. Foram utilizados indicadores de avaliação a conduta na busca, diagnóstico, tratamento e seguimento de cinco doenças infecciosas. Entre as 390 puérperas entrevistadas a realização dos exames na maternidade para rastreamento da sífilis e HIV e hepatite B, tiveram uma frequência de 98,2% e 99,7%, respectivamente, sendo considerados regulares, o de hepatite B foi de 26,2%, sendo considerado insatisfatório. As prevalências observadas foram de 3,4% para infecção de sífilis; 0,4 de HIV. As amostras de hepatite B foram negativas. A realização dos exames no Pré-natal de toxoplasmose e malária, observamos uma frequência de 81,3% e 0,8% respectivamente, porém não houve positividade, foram considerados insatisfatórios quanto à realização desses exames. O estudo evidenciou limitações da atenção ao parto realizada nas maternidades, dentre elas, falhas no atendimento ao parto e nascimento, assim como competência para obtenção da qualidade da assistência.

Palavras-chave: avaliação da qualidade dos cuidados de saúde, assistência ao parto, doenças infecciosas, complicações do trabalho de parto, mortalidade materna.

1 INTRODUCTION

It is indisputable that the quality of care provided before birth and childbirth has become a matter of concern in many countries. It is estimated that every year approximately 358,000 women worldwide die from complications associated with pregnancy, 99% of which occur in developing countries (WHO, 2010).

The Ministry of Health recommends starting prenatal care in the first trimester and a minimum of six visits, one in the first trimester, two in the second and three in the third. After childbirth, a visit should be made until the 42nd week of the puerperium (BROUSSELLE et al., 2011, p. 33-34).

Early identification and appropriate management of the factors that increase the risk of developing severe maternal morbidity and mortality contributes to qualified care, as well as preventing deaths. Several previous studies have identified a series of factors that contribute to a high risk of severe maternal morbidity progressing to death, such as delay in identifying high-risk status and inadequate management and referral, inadequate and sub-optimal prenatal care and clinical care during childbirth and postpartum (GELLER et al., 2004; OLIVEIRA et al., 2009; OLADAPO et al., 2005).
In this context, in order to improve perinatal indicators, health service activities must take place in an integrated and continuous manner throughout the pregnancy, childbirth and postpartum process. It is important that, during prenatal care, the pregnant woman receives care such as nutritional support, has infections treated and is advised on breastfeeding, preparing for childbirth and how to recognize danger signs. In addition, during labor and birth, qualified care is essential to identify complications and carry out appropriate procedures. The newborn should also receive essential care after birth (BHUTTA et al., 2005).

Studies from different parts of the world, including the United Kingdom, show a higher risk of mortality among women who do not receive adequate prenatal care (OLADAPO et al., 2005; (NAIR; KURINCENT; KNIGHT, 2014; SACHS et al., 1987).

Although there is a debate about the role of prenatal care in preventing maternal deaths caused by acute illnesses that arise close to childbirth, this care is of fundamental importance in identifying high-risk pregnant women (such as women with hypertensive disorders, medical morbidities, anemia and infections) and reducing the risk of mortality is widely accepted (CARROI; ROONEY; VILLAR, 2001).

In addition, among the complications are maternal infections such as HIV, syphilis, toxoplasmosis, hepatitis B and malaria, among others. These diseases have been associated with miscarriage, premature birth, stillbirth, low birth weight and can be vertically transmitted causing neonatal morbidity and mortality (NEWTON, 1999). Other frequent complications are hypertensive syndromes, which are among the main causes of maternal deaths worldwide (BRASIL, 2001).

In this context, the aim of this study was to evaluate the quality of screening for infectious diseases during prenatal care and childbirth.

2 METHODOLOGY

This is a cross-sectional study of a sample of women aged between 10 and 49 years in immediate puerperium seen between June and July 2015 in public maternity hospitals in the municipality of Manaus, Amazonas.

Simple random sampling was used to determine the sample size. The sample size was estimated based on data from 2010, when a total of 39350 live births were reported, approximately 75% of which came from the public network. Considering a proportion in the population of 50% to give the largest possible sample size with an absolute precision of 95% and a significance level of 5% using the virtual calculator available on the website.
(http://www.lee/dante.br/pesquisa/amostragem/amostra.html), the recruitment of 384 women in immediate puerperium in the maternity ward was estimated.

In addition, all the sample sizes were also estimated using Epinfo's statcalc. As the estimates were very close to 400, we opted to leave this number as the sample size of puerperal women in maternity hospitals.

The sample was selected on the basis of convenience, with the puerperal women chosen in such a way as to exhaust the sample from each maternity hospital. The size of the sample considered the proportion of hospital births and the route of delivery, according to the year 2013, according to the Live Birth Information System (SINASC). Data was collected from June to July 2015. A total of 391 puerperal women were interviewed in maternity wards in the first 24 to 72 hours after giving birth.

After including the puerperal women as research subjects, they were interviewed using a questionnaire designed specifically for this purpose by previously trained professionals.

The questionnaire was made up of questions on clinical, epidemiological and socio-economic data, prioritizing information on age, professional occupation, marital status, number of pregnancies, gestational age, number of prenatal consultations, among others.

In order to assess childbirth care, the conduct and routines adopted in maternity hospitals were identified and compared with the practices recommended for perinatal care, as outlined by the WHO and recommended by the Ministry of Health.

Quality was considered satisfactory when indicators remained above 80%, regular between 50% and 80% and unsatisfactory when below 50% (ALVES; SILVA, 2000).

However, specifically with regard to the indicators for carrying out VDRL and anti-HIV serological tests on pregnant women on admission to the maternity ward, as these procedures are recommended as essential, they were only assessed as satisfactory when coverage reached 100%.

After organizing and tabulating the data collected, it was analyzed using Excel 2010, EpiInfo 7 and Minitab 17.

The comparison of the distribution of the variables age, marital status, profession, schooling, parity, history of abortion, living children, chronic illness before pregnancy and number of prenatal consultations was validated using Student's t-test, with the results expressed as mean and standard deviation.

This study is part of the project "Evaluation of prenatal care and childbirth in the public health system of Manaus, Amazonas", which was carried out between June 18 and July 9, 2015, in the maternity hospitals of the public health system in the municipality of Manaus.
All the data in this project "Evaluation of Prenatal and Childbirth Control in the Public Health Network in Manaus" was collected retrospectively and prospectively from primary and secondary sources. The project was funded by "Public Call FAPEAM/DECIT-MS/CNPq/SUSAM No. 002/2012 - PPSUS-AM - Research Program for the SUS: Shared Health Management", and was submitted to and approved by the FMT-HVD Research Ethics Committee, with Consensualized Opinion No. 735. 837 of August 7, 2014.

All the puerperal women who agreed to take part in the study signed an informed consent form, in accordance with Resolution 466/2012 of the National Health Council.

3 RESULTS

The age of the puerperal women ranged from 12 to 46 years, with an average of 24.4 ± 6.3 years. Seventy-eight percent reported being married or living with a partner. With regard to profession/occupation, 66.5% reported being housewives. The average number of years of schooling was 10.5 ± 2.9 years and 0.3% reported being illiterate (Table 1).

Table 1: Sociodemographic characteristics of the women in immediate puerperium interviewed at the public maternity hospitals in Manaus between June and July 2015.

<table>
<thead>
<tr>
<th>Variável</th>
<th>n</th>
<th>%</th>
<th>IC (95%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Faixa etária</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 - 17 anos</td>
<td>48</td>
<td>12.3</td>
<td>[9.41 - 15.94]</td>
</tr>
<tr>
<td>18 – 34 anos</td>
<td>312</td>
<td>80.0</td>
<td>[75.75 - 83.67]</td>
</tr>
<tr>
<td>35 – 46 anos</td>
<td>30</td>
<td>7.7</td>
<td>[5.44 - 10.77]</td>
</tr>
<tr>
<td><strong>Estado Civil</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Casada ou vive com companheiro</td>
<td>305</td>
<td>78.3</td>
<td>[73.84 - 82.02]</td>
</tr>
<tr>
<td>Solteira</td>
<td>80</td>
<td>20.5</td>
<td>[16.80 - 24.80]</td>
</tr>
<tr>
<td>Separada/divorciada</td>
<td>4</td>
<td>1.0</td>
<td>[0.40 - 2.61]</td>
</tr>
<tr>
<td>Viúva</td>
<td>1</td>
<td>0.2</td>
<td>[0.05 - 1.44]</td>
</tr>
<tr>
<td><strong>Profissão/ ocupação</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Estudante</td>
<td>44</td>
<td>11.3</td>
<td>[8.51 - 14.81]</td>
</tr>
<tr>
<td>Do lar</td>
<td>258</td>
<td>66.1</td>
<td>[61.32 - 70.67]</td>
</tr>
<tr>
<td>Ocupações com renda</td>
<td>88</td>
<td>22.6</td>
<td>[18.69 - 26.97]</td>
</tr>
<tr>
<td><strong>Escolaridade</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Analfabeta</td>
<td>1</td>
<td>0.3</td>
<td>[0.05 - 1.44]</td>
</tr>
<tr>
<td>1– 4 anos</td>
<td>18</td>
<td>4.6</td>
<td>[2.94 - 7.18]</td>
</tr>
<tr>
<td>5 – 8 anos</td>
<td>98</td>
<td>25.1</td>
<td>[21.08 - 29.66]</td>
</tr>
<tr>
<td>9 – 11 anos</td>
<td>231</td>
<td>59.2</td>
<td>[54.29 - 63.99]</td>
</tr>
<tr>
<td>&gt;11 anos</td>
<td>42</td>
<td>10.8</td>
<td>[8.07 - 14.24]</td>
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<tr>
<td><strong>Faixa etária</strong></td>
<td></td>
<td></td>
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<td>4</td>
<td>1.0</td>
<td>[0.40 - 2.61]</td>
</tr>
</tbody>
</table>
Regarding the results of the variables of the tests carried out during hospitalization at the time of delivery, 98.2% of the women admitted for delivery had a VDRL test and 99.7% had HIV serology, which was considered regular. As for hepatitis B screening, 26.2% of the women had it, which was considered unsatisfactory (Table 2).

Table 2: Proportional distribution of puerperal women according to the tests carried out during hospitalization at the time of delivery, Manaus, 2015.

<table>
<thead>
<tr>
<th>Variáveis</th>
<th>n</th>
<th>%</th>
<th>IC (95%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Realizou exame de VDRL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Não</td>
<td>7</td>
<td>1,8</td>
<td>[0,87 – 3,66]</td>
</tr>
<tr>
<td>Sim</td>
<td>383</td>
<td>98,2</td>
<td>[96,34 – 99,13]</td>
</tr>
<tr>
<td>Realizou exame de HIV</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Não</td>
<td>1</td>
<td>0,3</td>
<td>[0,05 – 1,44]</td>
</tr>
<tr>
<td>Sim</td>
<td>389</td>
<td>99,7</td>
<td>[98,56 – 99,95]</td>
</tr>
<tr>
<td>Realizou exame de Hepatite B (N=386)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Não</td>
<td>285</td>
<td>73,8</td>
<td>[69,23 – 77,97]</td>
</tr>
<tr>
<td>Sim</td>
<td>101</td>
<td>26,2</td>
<td>[22,03 – 30,77]</td>
</tr>
</tbody>
</table>

Source: Authors

Regarding the result of the VDRL (Syphilis) test, 13 women (3.4%) had a reactive VDRL, all of whom were treated with 2,4000,00 IU benzathine penicillin (Figure 1).
With regard to anti-HIV serology, 1.0% of the sample tested positive, all of whom had been treated with intravenous AZT (Figure 2).

The results of the variables of the tests carried out in the prenatal period showed that 85.9% of the pregnant women had at least one VDRL test, of which 2.1% had a reactive result. Treatment was carried out with benzathine penicillin of 2,4000,00 IU, but it was observed that the pregnant women were reinfected, given the reactive result in the maternity hospital, showing a possible failure in the treatment. With regard to HIV serology, the frequency was 84.4%, with 0.9% having a reactive result. For hepatitis B and toxoplasmosis tests, the frequency was 84.1%
and 81.3% respectively, with no reactive results. The frequency of the thick drop test for malaria screening was 0.8%, and there were no reactive results. As a result, these tests were considered unsatisfactory, given that all pregnant women should undergo them during prenatal care (Figure 3).

Figure 3: Frequency of infectious disease screening tests carried out during prenatal care among women interviewed in the immediate puerperium at public maternity hospitals in Manaus, Amazonas, between June and July 2015 (n= 390).

### 4 DISCUSSION

The average age found among the puerperae in this study (24.4 ± 6.3 years) is similar to that found in a study carried out in the municipality of Maringá in the state of Paraná (25.0 ± 6.4) involving 569 puerperae (NAGAHAMA; SANTIAGO, 2011). With regard to marital status, in a study carried out in the municipalities of Maringá and Cascavel, 86.1% of puerperal women reported being married (MONTESCHIO et al., 2014). Another study found 80.0% (DOMINGUES et al., 2014), data equivalent to the 78.3% identified in our sample.

In relation to profession/occupation in our study, 66.5% of the puerperal women reported being housewives, a high percentage when compared to a study carried out in Australia of 27.7% (CANTRILL et al., 2014), in Fortaleza the findings were 42.8% (DODT et al., 2010). The fact that only a small percentage of women are in paid employment contrasts with the growing trends of women entering the labor market, as a result of changes in the economic profile and the struggles of feminist movements.

With regard to schooling, this variable is of fundamental importance for understanding the differences in a population's reproductive health behavior. In our study, 59.2% of puerperal
women had between 9 and 11 years of schooling, similar to 58.6% in a study carried out in the state of Rio Grande do Norte (SOUZA; ARAÚJO; COSTA, 2011).

In relation to the syphilis screening test carried out on parturients admitted to maternity hospitals, our study found that 98.2% underwent the VDRL test, demonstrating a failure in care, as the Ministry of Health recommends that all pregnant women admitted to maternity hospitals for delivery should undergo the same test (BRASIL, 2007), with a prevalence of 3.4%. A study carried out in the Amazon region at the FMT-HVD found a frequency of 1.2% among 674 pregnant women tested for syphilis (MACHADO FILHO et al., 2010), in Fortaleza the frequency was 7.7% among 222 pregnant women tested (ARAÚJO et al., 2013), and a study carried out in Bahia identified 7,038 cases of congenital syphilis, of which 2,145 (30.5%) pregnant women were diagnosed with maternal syphilis at the time of delivery/curettage, 1,025 (14.6%) after delivery, and 54 (0.8%) were not diagnosed (SOUSA et al., 2019).

In our study, the findings regarding HIV serology in parturients admitted to maternity hospitals were 99.7%, with a 1% prevalence of positive serology, and these women were unaware of their carrier status, since the results of HIV screening during prenatal care were negative. In a study carried out in Caxias, the frequency was 0.4% (CÂMARA, 2014), and in São José do Rio Preto the frequency was 2.1% among 531 pregnant women tested (GONÇALVES et al., 2010). In Cameroon, HIV prevalence was 2.1% (EGBE et al., 2016). In Tanzania, the prevalence was 2.0% (LAWI et al., 2015) and in Nigeria it was 1.2% (UKAIRE; AGBOGHOROMA; DUROJAIYE, 2015). In these studies, the women were also unaware of their carrier status. We note that these findings demonstrate the importance of carrying out HIV screening at the end of pregnancy and at the time of delivery, thus contributing to the prevention of vertical transmission.

With regard to hepatitis B screening among parturients admitted to maternity hospitals, our findings were that 26.2% underwent the test, but that no woman had a positive serology. This finding should be interpreted with caution, given the percentage of women who underwent the test. A study carried out in the Amazon region at the FMT-HVD found a frequency of 0.7% (MACHADO FILHO et al., 2010). In the municipality of Catalão, GO, in a public maternity hospital, the prevalence was 2.2% (FERNANDES et al., 2014). In Hong Kong, in a study including 10,808 pregnant women, the prevalence was 7.5% (LAO et al., 2014) and in Iran the prevalence was 1.5%, including 768 pregnant women (AFZALI et al., 2015).

In our sample, 85.9% of the pregnant women had at least one VDRL test and the prevalence of positive tests was 2.1%. In a study carried out in Fortaleza, the frequency of VDRL tests was 98.1% and the positive result was 5.4% (ARAÚJO et al., 2013).
In relation to HIV serology, the frequency was 84.4%, with 0.9% having a reactive result. In the hepatitis B and toxoplasmosis tests, we observed a frequency of 84.1% and 81.3% respectively, with no reactive results. While a study carried out in Itajaí-SC found that all pregnant women were tested for HIV, hepatitis B and at least one test for syphilis, the prevalence was 1.7%, 0.4% and 0.4% respectively (KUPEK; OLIVEIRA, 2012).

With regard to toxoplasmosis, a study carried out in Paraná including 1,534 pregnant women found that 97.7% were tested for IgG and IgM antibodies, with positivity of 59% and 1.1% (FEREZIN; BERTOLINI, 2013). In Japan, a study of 4,466 pregnant women found a prevalence of 10.3% (SAKIKAWA et al., 2012) and in Egypt the prevalence was 50.8% in the high-risk pregnancy group and 8.3% in the normal pregnancy group (KAMAL et al., 2015). In addition, in a study carried out in Rio de Janeiro including 100 pregnant women, 28% (28) with seroreactivity showed IgG+ and IgM- results, indicating an old infection, and 3% (3) were positive for IgG and IgM. Only 2% (2) of the samples showed IgM antibodies alone in the first test, representing a high number compared to other studies (RICHTRMOC et al., 2020).

In relation to the thick drop test for malaria screening, our findings reveal that only 0.8% of pregnant women underwent the test, demonstrating a failure in care during prenatal care, given that the Ministry of Health recommends that the thick drop test be carried out at all prenatal consultations in the states of the Legal Amazon (BRASIL, 2012).

In Manaus, a study carried out at the FMT-HVD including 1,699 women with malaria, 11.7% were pregnant (MARTÍNEZ- ESPINOSA; DANIEL- RIBEIRO; ALECRIM, 2004) and another study in the same city found a prevalence of 6.1% of malaria in pregnant women (DE ALMEIDA; BARBOSA; MARTÍNEZ- ESPINOSA, 2010). In Tanzania, a study of 1,835 pregnant women found a prevalence of 8.1% (MUTAGONDA et al., 2016). In Colombia, in another study including 582 women with malaria, 5.8% were pregnant (LOPEZ- PEREZ et al. 2016).

5 CONCLUSION

In this study, we observed limitations in maternity care, including shortcomings in labor and birth care, as well as competencies for achieving quality of care.

The VDRL, HIV and hepatitis B tests, carried out on admission for delivery in the maternity hospitals, were not carried out on all pregnant women, demonstrating shortcomings in the screening for these diseases, but in relation to the measures taken in response to the results, they were carried out in accordance with the recommendations of the Ministry of Health and were considered satisfactory.
Not all the women were tested for toxoplasmosis during the prenatal period, but there were no positive results. With regard to the thick drop test for malaria screening, few women were tested, demonstrating a failure in prenatal care, given that this test is recommended for all pregnant women living in an endemic area, but there were no positive results.

The prevalence of syphilis in the population studied is high in relation to that found by various authors. HIV prevalence is lower than that found in other studies.

The study revealed limitations in maternity care, including shortcomings in labor and birth care, as well as competencies for achieving quality care.

In view of these limitations, it is essential to improve the quality of prenatal care and childbirth in relation to carrying out these tests, with a view to preventing mother-to-child transmission and promoting better maternal and neonatal outcomes.

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