

Comparison between Postpartum Smokers and Ex-Smokers as to Breastfeeding Duration and its Impact on the Health of Newborns

Comparação entre Puérperas Fumantes e Ex-Fumantes com Relação ao Tempo de Amamentação e suas Consequências sobre a Saúde dos Recém-Nascidos

Comparación entre los Fumadores y ex Fumadores Después del Parto con Respecto a la Duración de la Lactancia Materna y su Impacto en la Salud de los Recién Nacidos

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Abstract

Introduction: The harmful influence of tobacco smoking during pregnancy and breastfeeding is widely described in the literature. **Objective:** To evaluate the relationship between the duration of breastfeeding and tobacco smoking among mothers smokers and ex-smokers in the Hospital de Clínicas de Porto Alegre and its effects on their babies. **Method:** A cross-sectional study applying a questionnaire by telephone among mothers smokers in the HCPA, separated in two groups: women who had not smoked after delivery (G1) and those who smoked after delivery (G2). Continuous variables were described by measures of central tendency and dispersion; categorical variables by absolute and relative frequencies. Means were compared with Student-t and complications between the groups with chi-square. **Results:** 154 mothers were evaluated, respectively, 75 in G1 and 79 in G2. Age did not differ between groups (26.0 and 24.7 years); 67.5% had prenatal care and, of these, half did not smoke during the postpartum period. Only 51.3% received medical information that smoking could cause complications for her and her baby. There was no statistically significant difference with respect to problems or respiratory problems in babies. The groups breastfed, on average, 7.2 (G1) and 6.2 (G2) months and there was no statistically significant difference between them. In group G2, there was a tendency for breastfeeding cessation due to respiratory causes ($p=0.058$). **Conclusion:** There were no significant changes with respect to respiratory problems in infants or early breastfeeding cessation in mothers who smoke. However, tobacco smoking is a worrisome public health problem and should receive continued attention in this special group of women. **Key words:** Smoking; Breast Feeding; Tobacco; Postpartum Period

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INTRODUCTION

The pernicious influence of smoking during pregnancy and breastfeeding is widely described in medical literature. Maternal smoking not only causes damage to the baby during its intrauterine life, as, for example, growth restriction, low birth weight, premature rupture of membranes and placenta previa; its effects also affect the postnatal period, including early termination of breastfeeding and its effects on child development¹⁻².

According to the World Health Organization, there is an increasing trend of smoking among women, and it is known that its onset coincides in time with the period of childbearing age³, but even though some women quit smoking during pregnancy, many of them take up smoking in the immediate postpartum period or during the postpartum period and concomitantly with breastfeeding⁴⁻⁵. It is known that these women generate higher spendings on health care than nonsmokers⁶. Breastfeeding rates in the United States are below the recommended guidelines, and even lower among smokers, among who there is a perception of lower milk production⁷⁻⁸. Smoking is associated with a shorter duration of breastfeeding: lower volume and a lower fat content in milk are some factors involved. Furthermore, the sleep of the baby is affected, which may also explain the change in their eating pattern. A healthy lifestyle, high educational level and previous positive breastfeeding experience are characteristics that significantly improved continuity rates for the maintenance of breastfeeding⁹.

American studies suggest that the prevalence of smoking during pregnancy varies from 8.8% to 20.3%¹⁰⁻¹¹. In Brazil, there is a prevalence between 23% and 25%, and the following risk factors are detected: white race, low socioeconomic status, low educational background and single marital status^{1,12}. Not undergoing prenatal care is more frequent in the population of smokers, which implies an increased risk of maternal infections, complications for the fetus and consumption of illicit drugs¹³. Smoking mothers expose their children to a risk of sudden infant death syndrome¹⁴⁻¹⁶, type 2 diabetes mellitus in young adults¹⁷, asthma¹⁸ and deleterious cognitive effects². Infants of mothers who smoke more than five cigarettes per day tend to have symptoms that sometimes are not noticed as fetal smoking withdrawal symptoms that can be facilitators of cessation of breastfeeding, such as colic and crying¹⁹.

Nicotine decreases the production of breast milk through inhibition of prolactin secretion and therefore smoking reduction can substantially increase the breastfeeding period^{3,13}; however, studies suggest that the social and behavioral differences between smokers and nonsmokers may be more important than possible physiological effects of smoking⁵. Among the immediate

effects of this substance significant reduction in infant sleep²⁰ may occur; but smoking does not contraindicate breastfeeding though, because its benefits are greater than any risk associated to early weaning. Breastfeeding for more than three months attenuates the effect of repeated respiratory infections and the risk of developing asthma between 1 and 10 years of age²¹.

In view of the numerous benefits that the period of breastfeeding provides to the baby and the widely proven harms that smoking causes at this stage of child development, this study evaluated the relationship between the duration of breastfeeding and postpartum smoking among smokers and former smokers at the Hospital de Clínicas de Porto Alegre (HCPA) and its consequences for the health of babies.

METHOD

A prospective and cross-sectional study, with application of a questionnaire by telephone on postpartum women in HCPA, from October 2007 to March 2008. The project has obtained approval of the Research Ethics Committee of HCPA, N° 07-511, and all women previously signed the term of consent.

The patients included were healthy, with complete gestational periods (over 37 weeks), who delivered their babies at HCPA, without complications during prenatal or childbirth. All patients who could not be contacted during the study period or had their data charts incomplete were excluded.

The protocol included identification data, history of smoking in the postpartum period and its complications on the health of newborns, feeding preferably with breast milk (defined as breast feeding at least five times a day).

The variables analyzed were: (a) demographic data: age, marital status, race, educational background and parity, (b) history: smoking during the postpartum period, information on treatments for smoking cessation, abstinence time or smoking relapse after birth, and number of cigarettes a day; perinatal data, pathological diagnosis and hospitalization of the child in the postpartum period, (d) postpartum data, breast feeding duration predominantly with breast milk, breastfeeding cessation causes.

For statistical purposes, the sample was divided into two groups: (1) women who had not smoked after delivery and (2) women who smoked after delivery. Continuous variables were described by measures of central tendency and dispersion (mean and standard deviation or median and interquartile range as data show normal distribution or not), and the groups were compared with Student's t and Mann-Whitney tests (with significance level of $p < 0.05$). Categorical variables, as absolute and relative frequencies, and data from the two groups were compared using Fisher's exact test and chi-square test.

RESULTS

The studied population was acquired as a result of a previous study that assessed smoking during pregnancy in a sample of 346 mothers²². Of this initial sample, a total of 154 mothers were interviewed by telephone, with a follow-up loss of 55%. Of the patients interviewed, 49% (n = 75) did not smoke in the postpartum period (group 1) and 51% (n = 79) smoked in the postpartum period (group 2).

The demographic characteristics are presented in Table 1. The average age was 25 years old, with an interval between 16-45 years of age, and did not differ between groups. Of the study group, 61% of patients were white, 58% had high school or higher education and 67.5% received prenatal care. Of those who had prenatal care, that is, at least six visits, half didn't smoke during postpartum period.

Only 51.3% of patients received medical information during pregnancy that smoking could cause complications for their child during breastfeeding. After postpartum and breastfeeding period, only three women reported having done some treatment to quit smoking. With regard to marital status, among the unmarried, 40% of them never quit smoking during the period of breastfeeding; among married women, 60% didn't smoke in the same period ($p < 0.001$).

With respect to perinatal monitoring data (Table 2), there was no statistically significant difference with respect to issues presented at birth or hospital admissions. After birth, 46 children (30%) were diagnosed with some disease, of whom 34 (22.1%) had some trouble breathing (bronchiolitis, asthma, bronchitis) and 27 (17.5%) were hospitalized for this reason, and there was no significant

difference between groups. Patients breastfed on average 6.7 months and there was no statistically significant difference in the time of breastfeeding among groups. We classified the reason for discontinuation of breastfeeding as being related to smoking (decreased milk, respiratory diseases of children, need to complement the breast milk and not adequate gain weight by the infant) and other causes (desire of the mother or child, return to work, use of medications by the mother that contraindicates breastfeeding or breast pathologies).

Of the total sample, 108 children (70%) were exposed daily to smoke at home (a close relative such as a parent or grandparent), yet there was no statistically significant difference in the emergence of disease or need for hospitalization during the period after birth.

DISCUSSION

The literature states that the prevalence of pregnant and postpartum women smokers is 23% to 25% and that, among these, most are white, of low socioeconomic status, low educational background and single^{3,12-13}. The demographic data of this study differed from the literature, since the skin color, educational background and the presence of prenatal care were not statistically significant between the groups in the postpartum period with regard to continuity of smoking during the breastfeeding period. Demographic data were relevant to the acknowledgement of the smoking mothers's profile at HCPA for future planning of treatment strategies for these patients.

The data in this study were obtained by telephone interview and filling out of questionnaires. With this, there was a high follow up loss, though expected. This

Table 1. Characteristics of studied groups

| Variable | Group 1: did not smoke after delivery (n=75) | Group 2: smoked after delivery (n=79) | p |
|----------------------------------|--|---------------------------------------|--------------------|
| Age (years) | 26.0±6.3 | 24.7±6.3 | 0.709 ^a |
| Skin color (n%) | | | |
| White | 49 (52%) | 45 (48%) | |
| Non-white | 26 (43%) | 34 (57%) | 0.287 ^b |
| Educational Background (n%) | | | |
| Illiterate and elementary school | 30 (46%) | 35 (54%) | 0.589 ^b |
| High school / higher education | 45 (51%) | 44 (49%) | |
| Prenatal (n%) | | | |
| No | 23 (46%) | 27 (54%) | 0.642 ^b |
| Yes | 52 (50%) | 52 (50%) | |

^a= t test ^b= Chi square test.

Table 2. Characteristics of newborns during breastfeeding by groups

| Variable | Group 1: did not smoke after delivery (n=75) | Group 2: smoked after delivery (n=79) | P |
|---|--|---------------------------------------|--------------------|
| Problems: | | | |
| None | 57 (76%) | 51 (64.5%) | 0.294 ^a |
| Respiratory | 13 (17.3%) | 21 (26.5%) | |
| Other | 5 (6.7%) | 7 (9.0%) | |
| Hospitalizations: | | | |
| None | 51 (68%) | 59 (74.6%) | 0.647 ^a |
| Respiratory | 15 (20%) | 12 (15.2%) | |
| Other | 9 (12%) | 8 (10.2%) | |
| Time of breastfeeding (months) | 7.2±4.7 | 6.2 ± 4.3 | 0.472 ^b |
| Reason of breastfeeding interruption | | | |
| Smoking-related | 11 (14.7%) | 23 (29.1%) | 0.058 ^a |
| Other causes | 35 (46.6%) | 33 (41.8%) | |

^a= t test ^b= Chi square test.

was related to the fact that our patients often exchanged address or phone within a short time between studies²². Such an approach sometimes brings greater fragility to data that could be underestimated with high rates of false-negative or incur in recall bias, as in a similar study²³. Concentrations of metabolites of nicotine, as cotinine, could be tested in mothers or in newborns in order to confirm the information on the use of tobacco in the puerperal period²⁴. Researches show that infants breastfed by smoking mothers have urine cotinine levels ten times higher than those without breastfeeding, but with secondhand smoke exposure; and still 50 times higher than those not exposed to smoke, regardless of nourishment².

The literature indicates that most women who get prenatal care get to the first appointment with no history of smoking or having already quit smoking before or immediately when they find themselves pregnant⁹. With respect to performing prenatal as a protective factor for the maintenance of smoking in the period of breastfeeding, this study showed no difference in the sense of protection. It seems that perhaps our prenatal care is not effective when it comes to properly inform our mothers about the risks of smoking and its relationship with breastfeeding, because only 51% of patients received some information about it in their prenatal visits. These guidelines should be encouraged by any health care provider.

The literature shows a greater risk of respiratory problems and hospitalization among infants born to

mothers who smoke during breastfeeding^{13,21}. Besides the direct effect of smoking, there seems to be a change in the lower airway colonization by pathogens, increasing the frequency and intensity of diseases of infectious etiology in pediatric age²⁵; however, among the patients interviewed, this was not significantly different between groups.

Among pregnant women who smoke, only three said they had some treatment during pregnancy to quit smoking, two treated with homeopathic medication and one with bupropion hydrochloride, which has B risk during pregnancy and breastfeeding. This proves that smoker mothers in postpartum period are inappropriately treated and many treatment options that have been discussed in the literature are not offered². Encouraging smoking cessation is the minimum (up to 3 minutes of information on risks, for example); evidence suggests that psychosocial intervention must overcome it (5-15 minutes of conversation with different health professionals offers, by itself, a statistical advantage). Despite being controversial, reducing the number of cigarettes smoked per day should be encouraged. There are no studies in pregnant or lactating demonstrating the benefit of pharmacotherapy, but overall its use is recommended in any patient without a specific contraindication to treatment. Replacement with nicotine, for example, must be used under strong supervision and following guidance on the risks of treatment. Bupropion, despite increasing the risk of birth defects when used in the first quarter, can be used and has shown to increase rates of smoking cessation².

While breastfeeding time is been reported as lower in mothers who smoke^{3,13}, this study showed no such difference. Perhaps this is due to a local culture that emphasizes more and more the habit of breastfeeding as a protective factor for newborns²¹, unlike what happens in the United States, where breastfeeding is declining⁷⁻⁸. The reasons leading to discontinuation of breastfeeding as to smoking did not differ between groups, and perhaps this is explained by the average length of breastfeeding being 6.7 months between groups and the fact that it is a cultural perception that, even for smoking mothers, the benefits of breastfeeding outweigh the risks.

CONCLUSION

It should be noted that although this study did not point out the risks, perhaps due to a biased sample, smoking concomitant to breastfeeding remains an important public health problem with consequences that involve not only the health care system, but also the economy of society as a whole. Therefore, it is necessary that, in prenatal consultations, information about the risks of smoking during postpartum continue to be delivered.

In this sense, guidance campaigns should keep on addressing this issue in order to educate smoker mothers, especially, of the dangers and harmful effects of smoking on their newborn children during breastfeeding.

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CONTRIBUTIONS

Adriani Oliveira Galão worked in the design and research outline, methodology, analysis and interpretation of data and final writing and overall coordination and supervision of work; Bruno Rocha de Macedo, Rafaela Vanin Pinto Ribeiro, Roberto Vanin Pinto Ribeiro, Carla Maria de Martini Vanin worked in the interpretation of data, data analysis and final writing.

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Resumo

Introdução: A influência nociva do tabagismo no período gestacional e na amamentação é amplamente descrita na literatura. **Objetivo:** Avaliar a relação entre o tempo de amamentação e o tabagismo entre as puérperas fumantes e ex-fumantes do Hospital de Clínicas de Porto Alegre e suas consequências para a saúde dos bebês. **Métodos:** Estudo transversal com aplicação de questionário via telefone em puérperas fumantes do HCPA, divididas em 2 grupos: mulheres que não fumaram (G1) e que fumaram (G2) após o parto. Variáveis contínuas foram descritas por medidas de tendência central e dispersão; variáveis categóricas, por frequências absolutas e relativas. As médias foram comparadas com *t* de Student e as complicações entre os grupos com Qui-quadrado. **Resultados:** Avaliadas 154 puérperas: 75 (G1) e 79 (G2). A idade não diferiu entre os grupos (26,0 e 24,7 anos); 67,5% tinham feito pré-natal e, destas, metade não fumou no pós-parto. Somente 51,3% receberam informação médica de que o fumo poderia trazer complicações para ela e seu bebê. Não houve diferença estatisticamente significativa com relação a problemas ou intercorrências respiratórias nos bebês. As puérperas amamentaram em média 7,2 (G1) e 6,2 (G2) meses e não houve diferença estatisticamente significativa entre os grupos. No grupo G2 houve uma tendência à interrupção da amamentação por causas respiratórias ($p=0,058$). **Conclusão:** Não houve alterações significativas com relação a problemas respiratórios nos bebês ou parada da amamentação em puérperas fumantes. No entanto, o tabagismo é um preocupante problema de Saúde Pública e deve receber atenção constante nesse grupo especial de mulheres.

Palavras-chave: Tabagismo; Aleitamento Materno; Tabaco; Período Pós-Parto

Resumen

Introducción: La influencia perjudicial del tabaquismo durante el período de embarazo y de lactancia está ampliamente descrita en la literatura. **Objetivo:** Evaluar la relación entre la duración de la lactancia materna y el acto de fumar entre los fumadores y ex fumadores madres del Hospital de Clínicas de Porto Alegre y sus efectos sobre sus bebés. **Método:** Estudio transversal con un cuestionario por teléfono entre las mujeres fumadoras del HCPA. Se dividieron: las mujeres que no habían fumado después del parto (G1) y las que habían fumado después del parto (G2). Las variables continuas se describen con medidas de tendencia central y dispersión; las variables categóricas mediante frecuencias absolutas y relativas. Las medias se compararon con la *t* de Student y las complicaciones entre los grupos con Chi-cuadrado. **Resultados:** 154 mujeres evaluadas: 75 (G1) y 79 (G2). La edad no fue diferente entre los grupos (26,0 y 24,7 años), el 67,5% tenían control prenatal y de éstos, la mitad no fumó durante el período posparto. Sólo el 51,3% recibió la información médica que el fumar puede causar complicaciones para ella y su bebé. No hubo diferencias estadísticamente significativas con respecto a los problemas o complicaciones respiratorias en los bebés. Los grupos de lactancia materna en meses promedio de 7,2 (G1) y 6,2 (G2), y no hubo diferencias estadísticamente significativas entre ellos. En cuanto al motivo de finalización de la lactancia materna, en el grupo 2 hubo una tendencia a romperse por causas respiratorias ($p = 0,058$). **Conclusión:** No hubo cambios significativos con respecto a los problemas respiratorios en los bebés o la interrupción temprana de la lactancia materna entre las mujeres fumadoras. Sin embargo, el tabaquismo es un problema preocupante de salud pública y debe recibir atención continua en este grupo especial de las mujeres. **Palabras clave:** Tabaquismo; Lactancia Materna; Tabaco; Periodo de Posparto