Prevalence of postpartum depression and associated factors

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Abstract

Objective
To assess the prevalence of postpartum depression and associated factors.
Methods
The study was carried out in Pelotas, a city in the Southern region of Brazil, between October and November 2000. Mothers (n=410) were interviewed in the hospital using two questionnaires on obstetric and psychosocial data. Later, these mothers were visited at home, within 30 to 45 days after delivery. Occurrence of postpartum depressive symptoms was assessed by the Hamilton Scale for Depression. Chi-square test was used for comparison between proportions and non conditional logistic regression was utilized in the multivariate analysis. Data analysis was conducted hierarchically: economic variables in the first level, sociodemographic in the second level, the obstetrics variables in the third level and, in the fourth level, the psychosocial variables.
Results
The prevalence of postpartum depression observed in this sample was 19.1%. Family income (OR=5.24; CI 95%: 2.00-13.69), preference as to the child's gender (boys: OR=3.49; CI 95%: 1.76-6.93) and thinking about interrupting the pregnancy (OR=2.52; CI 95%: 1.33-4.76), were variables associated with postpartum depression.
Conclusions
These results indicate that low economic status of the puerperal woman and nonacceptance of pregnancy are key elements in the development of postpartum depression.

INTRODUCTION

Postpartum depression (PPD) is an important public health issue, affecting both the mother's health and the child's development. The manifestation of this health problem occurs, in the great majority of cases, during the first four weeks after birth, usually reaching its greatest intensity during the first six months. The most common symptoms are persistent dismay, feelings of guilt, sleep disturbances, suicidal ideas, fear of harming the child, lack of appetite and decreased libido, inability to think clearly or make decisions and presence of obsessive or overvalued ideas.[1]

The prevalence of PPD is between 10 and 20% according to the majority of studies.[1,2,6,12] Variations in the rates of prevalence are probably due to the use of diverse diagnostic methods and criteria, as well as economic and cultural differences among the groups studied. In Brazil, in a study conducted in the District of Anaia, in São Gonçalo, in the state of Rio de Janeiro, Da Silva et al[6] observed a prevalence of 12% of depression during the third month of the postpartum period (N=33). Two other Brazilian studies found similar prevalences: 13.3% (N=120), in the Portuguese validation study* of the Postpartum Depresson Screening Scale (PDSS) conducted in Recife, Pernambuco, and

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13.4% (N=236) in the validation of the Edimburgh Post-Natal Depression Scale (EPDS) for Brazil.[11]

Less schooling[5] and low socioeconomic level[3,7,9,12] are factors more commonly associated with PPD. Among the psychosocial factors that presented greater association with PPD are lack of social support,[4,9] history of mental illness,[3,9,12] postpartum sadness,[3,7,9,14] antenatal depression,[9,12] low self-esteem, antenatal anxiety, stressful life events, unplanned preganacy,[7] an attempt to interrupt the pregnancy, premenstrual dysphoric disorder[14] and negative feelings in relation to the child.

Taking this into consideration, this study was conducted with the objective of evaluating the prevalence of postpartum depression and associated factors, differentiating itself from previous studies undertaken in Brazil due to its magnitude as well as to the fact that it is a population-based study.

METHODS

This study was conducted in the municipality of Pelotas, in the State of Rio Grande do Sul. It is considered a medium sized municipality, having approximately 340 thousand inhabitants. The selection of this sample for this population based prospective cohort, a random hospital sample, was undertaken during the months of October (odd days) and November (even days) of 2000, in the city's five maternities. The interviewers verified the births that had occurred on the previous day in the hospital registries, and collected all the data concerning the birth and the child's and mother's health status on the patient's file. In order to be included in the study, the mother had to be living in the urban zone and be able to comprehend and consent to participate.

While they were still in the maternity, the mothers were invited to participate in the study and, once their written consent was obtained, two questionnaires were applied. One of these investigated socioeconomic data (family income, social class, schooling and work during pregnancy), demographic data (age, civil status, sex of the child, number of children, and who was living with the mother) and obstetric data (medical orientation with respect to birthing, type of birth, number of antenatal consultations, live birth, weight of the

Table 1 - Distribution of the population. prevalence of postpartum depression according to socioeconomic. demographic and obstetric variables and odds ratio for PPD. Pelotas, Brazil, 2000.

Variable	N	p-value	Prevalence	Mean (SD)	OR (95% CI)
Family income (minimum wages)		p=0.005			
Up to 1	55		30.9%		5.24 (2-13.69)
1.1 to 3	146		21.9%		2.80 (0.97-8.06)
3.1 to 5	75		20.0%		2.72 (0.94-7.87)
5.1 to 10	89		7.9%		Reference
				512.84 (38.05)	
Social class		p=0.025			
A + B	78		10.3%		Reference
C	141		17.7%		1.88 (0.80-4.41)
D	165		24.8%		2.89 (1.28-6.51)
E	26		30.8%		3.89 (1.28-1.78)
Maternal education (years)		p=0.003			
Up to Junior High School incomplete	219		26%		6.32 (1.47-2.09)
Junior High School and High School incomplete	90		15.6%		3.31 (0.71-5.34)
High School graduate	60		11.7%		2.37(0.4612.08)
College	38		5.3%		Reference
				7.4 (3.48)	
Age (years)		p=0.005			
13 to 18	71		33.8%		2.80 (1.35-5.79)
19 to 30	234		17.9%		1.20 (0.64-2.25)
31 or more	104		15.4%		Reference
				25.74 (6.81)	
Marital status		p=0.012			
Married	239		15.9%		Reference
Single/ separated/ widowed	131		26.7%		1.92 (1.14-3.24)
N° Antenatal consultations		p=0.016			
None	15		40.0%		3.28 (1.11-9.62)
Up to 5	81		27.2%		1.83 (1.03-3.26)
6 or more	302		16.9%		Reference
				7.85 (3.56)	
Birthweight (grams)		p=0.72			
Less than 2,499	34		17.6%		0.84 (0.33-2.11)
More than 2,500	376		20.2%		Reference
				3195.52 (553.88)	
Number of children		p=0.724			
None	163		19.0%		Reference
1	95		18.9%		0.71 (0.37-1.38)
2	66		22.7%		0.71 (0.34-1.49)
3 or more	73		24.7%		0.89 (0.41-1.96)

SD: Standart deviation; OR: odds ratio; CI: Confidence interval

newborn, was an intermediary or neonatal ICU necessary and primiparity).

The other questionnaire evaluated psychosocial data (planning for parenthood, support from partner, family and/or friends during pregnancy, father's reaction to the pregnancy, whether the subject considered interrupting this pregnancy, whether she attempted to interrupt it, presence of a support person during labor and birth and preference with respect to the child's sex).

Home visits were conducted 30 to 45 days after the birth. During this visit and in order to measure and characterize the presence of depressive symptoms, Hamilton's Scale (HAM-D)[10] in its 21 item version was applied by trained evaluators. A continuous variable was derived from the sum of the points of the scale that was dichotomized afterwards. The cutoff point was established at 18 or more points that characterizes moderate to severe depression.[10] This cutoff point was chosen in an attempt to reduce the number of false positives, since clinical interviews were not utilized for diagnosis of depression.

The Chi-square test was utilized for comparing proportions, and non conditional logistic regression was utilized in the multivariate analysis. Statistical significance with respect to the introduction of each variable within the model was evaluated according to the verisimilitude ratio test. Logistic regression of the data was analyzed hierarquically: entry of socioeconomic data was on the first level, on the second level were the demographic variables, on the third weere the obstetric variables and on the last level were the psychosocial variables. In the hierarquical model, each block of variables from a specific level was included and those variables with a value of $p \leq 0.20$ in the verisimilitude ratio test were retained. The variables selected at one specific level were maintained in the subsequent models and were considered as risk factors for PPD, even if, with the inclusion of variables hierarchically inferior, they had lost their significance.

Presuming that the prevalence of depression n the population is 15% and that the margin of error is 3.5 percentual points, the estimated sample size was 373 puerperal women. Including 10% more for possible losses, the total sample was composed of 410 mothers.

The puerperal women with a diagnosis of postpartum depression were directed to the Psychological Clinic of the University, for specialized assistance. This research protocol was approved by the institutional scientific ethics committee.

RESULTS

According to data from the Municipal Department of Health, the total number of births in the municipality of Pelotas in the year 2000 was 5,617. The percentage of these mothers residing in the urban zone was 92% to 94%. Four-hundred and thirty mothers who gave birth between October and November 2000 in Pelotas five maternities were interviewed. The prevalence of postpartum depression within the sample was 19.1% (CI 95%: 15.7-23.3). The average score on the HAM-D Scale was 10.60 points with a standard deviation of 8.4 points. The losses summed up to 4%, and the total sample totalized 410 puerperal women.

The largest portion of the sample was composed of married puerperal women ranging from 20 to 29 years of age, with less than eight years of schooling and

Table 2 - Distribuition of the population, prevalence of postpartum depression according to psychosocial variables and odds ratio for PPD. Pelotas, Brazil, 2000.

Variable	N	p-value	Prevalence	OR (95% CI)
Planned parenthood		p=0.603		
Yes	174		17.8%	Reference
No	236		21.6%	1.27 (0.77-2.09)
Support from the child's father		p=0.030		
Much support	378		18.3%	Reference
Little support	25		36.0%	2.52 (1.06-5.93)
Support from the family		p=0.248		
Much support	395		19.7%	Reference
Little support	12		33.3%	2.03 (0.59-6.92)
Presence of support person during birth		p=0.595		
Yes	146		18.5%	Reference
No	261		20.7%	1.14 (0.68-1.92)
Thought of not having the child		p=0.005		
Yes	76		31.6%	2.60 (1.28-5.25)
No	333		17.4%	Reference
Tried to interrupt pregnancy		p=0.031		
Yes	14		42.9%	2.09 (0.56-7.67)
No	394		19.3%	Reference
Preference as to the child's sex		p=0.000		
Boy	91		33.0%	3.58 (1.94-6.60)
Girl	118		22.9%	2.36 (1.18-3.96)
No preference	199		12.1%	Reference

classified in the C and D categories of social classes. The prevalence of postpartum depression was greatest among mothers with lower socioeconomic level and less schooling (Table 1).

As to the obstetric factors, only the number of antenatal consultations presented an association with PPD (see Table 1). Among the psychosocial factors, a preference as to the child's sex, support from the father and having thought of interrupting the pregnancy were variables significantly associated with PPD (Table 2).

Among the variables pertaining to the first level in the multivariate analysis (income and social class) only income remained in the model. The results indicated that when income decreased the chance of occurring PPD increased, being that puerperal women with family incomes of up to one minimum salary had the greatest probability of becoming depressed (OR=5.24; CI 95%: 2.00-13.69). None of the sociodemographic variables analyzed in the second level of the model (age, years of schooling of the mother and civil status) remained within the model.

The number of antenatal consultations was included in the third level, but after adjusting for family income, the effect of the number of antenatal consultations was reduced and the variable did not remain within the model. For example, after adjusting for income, the chance of PPD in a puerperal woman that did not attend antenatal consultations modified from 3.28 (1.11-9.62) to 2.75 (0.88-8.49). Finally, the psychosocial variables (support from the child's father, thinking of interrupting the pregnancy, attempting to interrupt the pregnancy and preference as to the child's sex), were analyzed on the fourth level and only thinking of interrupting the pregnancy and preference as to the child's sex remained in the model. Among the mothers who preferred having boys, the brute chance ratio for PPD was 3.58 (1.94-6.6), decreasing, after adjustments, to 3.49 (1.76-6.93), whereas, for those mothers who preferred girls, the brute OR was 2.36 (1.18-3.96), decreasing to 1.88 (0.95-3.71). Whereas, among those mothers who thought of interrupting the pregnancy, the brute ratio was 2.60 (1.28-5.25), and it fell to 2.52 (1.33-4.76), thus maintaining the chances of depression (Table 3).

DISCUSSION

This is the first population based study conducted in Brazil that analyzes a sample of this magnitude. When comparing the prevalence found in this study with those found in studies conducted in other countries, a great heterogeneity of results is observed, varying from 5.92[13] to 27.5.[8] The inferior limit of the confidence interval of the present study does not include the prevalence value of some of the studies analyzed, confirming the discrepancy among the results, even when only population based studies are taken into consideration. (Table 4).

The prevalence of PPD in this study (19.1%) is greater than in other Brazilian studies[6,11] (Table 4), and may be due to methodological differences among the studies. The primary difference refers to the instrument utilized in the studies. Two of them utilized the EPDS and one utilized the PDSS whereas this investigation utilized the HAM-D Scale. Furthermore, two of these studies attempted to validate the respective scales utilized. Another possible cause of differences is the moment in which data was collected. This study utilized a period much closer to birth than the other national studies,[11] that also utilized a large spectrum of weeks for the evaluation. Furthermore, the sample utilized in this study was larger and more comprehensive than those utilized in the other studies for it was a population based study.

The socioeconomic variable that presented an association with PPD was family income, reitirating a similar result in other studies.[3,7,8,12] PPD is influenced by difficulties resulting from poverty. However, this investigation does not allow us to infer which of these difficulties are related to PPD. Another limitation of

Table 3 - Final hierarchical model for postpartum depression (odds ratio and 95% confidence interval). Pelotas, Brazil, 2000.

Hierarchical level	Variable	OR (95% CI)
1*	Family income (MW)	
	Up to 1	5.46 (1.93-15.45)
	1.1 to 3	3.24 (1.27-8.28)
	3.1 to 5	3.13 (1.12-8.76)
	5.1 to 10	Reference
4**	Thought of interrupting pregnancy	
	Yes	2.52 (1.33-4.76)
	No	Reference
4**	Preference as to child's sex	
	Boy	3.49 (1.76-6.93)
	Girl	1.88 (0.95-3.71)
	No preference	Reference

*Without adjustments
**Adjusted for family income and for another variable included in the same hierarchical level
MW= minimum wages

Table 4 - Summary of the studies on postpartum depression analyzed. Data with respect to the countries in which these studies were conducted, study design, number of cases evaluated, instrument, prevalence and moment in which depression was evaluated. Pelotas, Brazil, 2000.

Author & year	Country	Design	N	Instrument	Prevalence	Moment during the postpartum in which evaluation of depression was conducted
Cantilino* (2003)	Brazil	CS	120	PDSS*	13.3 (7.2-19.3)	2 to 15 weeks
Inandi et al[9] (2002)	Turkey	P/CS	2,514	EPDS**	27.2 (25.4-28.9)	1 year
Eberhard-Gran et al[8] (2002)	Norway	P/CS	2,730	EPDS	8.9 (7.8-9.9)	Not informed
Chaaya et al[5] (2002)	Leanon	P/CO	396	EPDS	21 (16.9-25)	1 day
Manzano et al[11] (2002)	Spain	P	306	EPDS	15.7 (11.6-19.8)	From the 3rd to the 8th week
Alvarado et al[2] (2000)	Chile	CO	125	EC DSM III***	22.4 (15-29.7)	8 weeks
Lee et al[10] (2000)	Hong-Kong	CS	220	EC DSM IV***	11.7 (7.3-16)	2 days
Vega-Dienstmaier et al[14] (1999)	Peru	CS	425	EC DSM IV	5.9 (3.7-8.1)	1 year
Santos et al[13] (1999)	Brazil	CS	236	EPDS	13.4 (9-17.7)	From the 6th to the 24th week
Da Silva et al[7] (1998)	Brazil	CS	33	EPDS	12 (9-23)	12 weeks
Abou-Saleh & Ghubash[1] (1997)	United Arab Emirates	CS	95	EPDS	18 (10-25.7)	1 week
Cox et al[6] (1993)	England	CC	232	EPDS	13.8 (9-18)	6 months

CS: Cross-sectional; P: Population based; CO: Cohort; CC: Case-control
PDSS: Postpartum Depression Screening Scale
EPDS: Edinburgh Post-natal Depression ScaleEC DSM III & IV: Clinical Interview DSM III & IV
*[1]Cantilino A. Translation to the Portuguese and validation study of the Postpartum Depression Scale in the Brazilian population [Masters dissertation]. Recife: Universidade Federal de Pernambuco [Federal University of Pernambuco]; 2003.

this study refers to the lack of evaluation of other important variables such as the existence of psychiatric problems prior to pregnancy and the presence of depression during pregnancy.

No association was found between the occurrence of postpartum depression and demographic and/or obstetric variables. On the other hand, this study indicates that a preference as to the child's sex and having thought of interrupting the pregnancy were associated to PPD. Apparently, a feeling of rejection towards maternity as expressed when considering the idea of not having the child is a factor that increases the likelihood of postpartum depression.

It may be concluded that the precarious socioeconomic conditions of the puerperal woman and the latter's lack of acceptance of her pregnancy are the factors that most influenced the emergence of postpartum depression.

The high prevalence of postpartum depression found reinforces its significance as a public health issue, requiring prevention and treatment strategies. The careful follow up of mothers, particularly those in low income families, by means of integrated actions that take into consideration the factors associated with depression, may prevent severe personal and family problems that result from PPD.

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