

# Logistic Regression of Post-Partum Amenorrhoea on Exclusive Breastfeeding

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## Citation

G Singh. *Logistic Regression of Post-Partum Amenorrhoea on Exclusive Breastfeeding*. The Internet Journal of Gynecology and Obstetrics. 2006 Volume 7 Number 1.

## Abstract

The objective of this paper was to study the relationship between duration of post-partum amenorrhoea (PPA) and duration of exclusive breastfeeding based on interview of 47 women. PPA period in a woman is an interval that begins at the termination of a conception and ends with the resumption of ovulation. The duration of amenorrhoea depends on a number of factors and varies considerably in women. Logistic regression analysis was performed using PPA as dependent variable and exclusive breastfeeding as independent variable. The result showed a statistically significant relationship between PPA period and duration of exclusive breastfeeding. The proportion of women having longer PPA period was higher with longer exclusive breastfeeding period. A number of studies showed significant positive correlation and regression between duration of PPA and duration of breastfeeding including this study.

## INTRODUCTION

The fecundability of a woman is temporarily discontinued following each conception when menstruation ceases for some time. Postpartum amenorrhoea is associated with each conception regardless of its outcome. The length of PPA in women may vary depending on a number of factors like age, marital duration, number of pregnancies, nutritional status of woman etc.<sup>[1]</sup> It has been reported that PPA period is positively correlated with period and practice of breastfeeding.<sup>[2,3,4]</sup>

The objective of the present work was to study the relationship between duration of PPA and duration of exclusive breastfeeding for a group of women utilizing logistic regression procedure considering the duration of postpartum amenorrhoea as dependent variable and duration of exclusive breastfeeding as independent variable for a group of women (n=47) who had delivered a child within last one year from survey date. Thus subjects of the study were women whose youngest child is less than or equal to one year on date of survey. Exclusive breastfeeding refers to the practice of feeding only breast milk excluding water, breast milk substitutes, other liquids and solid foods. Exclusive breastfeeding for the first six months is the most appropriate infant feeding practice.

## MATERIALS AND METHOD

A sample of 47 women was selected from child

immunization centre at Varanasi, India in the year 2004 where they came with their child for vaccination. Women included in the study were those, whose youngest child was aged less than or equal to one year on the date of interview. Inclusion criteria: (1) women aged 20-34 years, (2) parity of any order, (3) visiting the immunization centre with her youngest child for vaccination, (4) youngest child aged less than or equal to 12 month. Exclusion criteria: (1) women who had taken any hormonal treatment after last delivery to prolong the time of resumption of ovulation to ensure prevention of early conception, (2) women who were not sure about time of their first menstruation after last delivery, (3) pregnant women reporting conception before the onset of first menses. In this study the duration of PPA is estimated as an interval between last live birth and return of first menses. Women were interviewed through a study proforma.

## RESULTS

The durations of postpartum amenorrhoea and exclusive breastfeeding were divided into monthly time interval and there interrelation was shown in Table-1. 36.2% women reported less than or equal to 3 months period of PPA while 63.8% had the interval more than 3 months. It was interesting to note that 12.8% women had this interval more than 6 months. It may be argued that increase in full breastfeeding period leads to increase in PPA period though, up to certain period not beyond.

Logistic regression analysis (LRA) describes the relationship between a dichotomous outcome or dependent, or response variable (here, PPA) and one or more explanatory or independent, or predictor variables (as here, exclusive breastfeeding). Subjects were classified according to PPA duration. As breastfeeding prolongs PPA period up to certain period of time therefore, two cutoffs (3 months and 6 months) were chosen to investigate such a relationship. As the aim was to study the effect of exclusive breastfeeding, which is ideally practiced for first six months therefore, it was planned to take monthly duration of PPA as cutoff for LRA. However, to avoid complexity in interpretation only two cutoffs 3 and 6 months were chosen. These intervals were also considered appropriate because median PPA was in between these. Two LRA were performed separately and results were shown in Tables 2 and 3. In Table-2 data on PPA of less than or equal to 3 months (PPA3) were used and in Table-3 less than or equal to 6 months (PPA6) were used. Both models fitted well and the coefficient  $\beta$  (of the variable exclusive breastfeeding) was found significant for both equations concluding that an increase in the duration of exclusive breastfeeding may result in increase in the PPA period. Result of the analysis revealed similar trend in the relationship studied for both cutoffs. As the two were not compared, which cutoff exhibited stronger relationship could not be shown.

The women included in this study were of age in between 20-34 years, mostly housewives and belonged to middle-class family. Women were included regardless of parity. There is a need to explore further such a relationship for specific parity, which could not be done in this study due to small sample size.

**Figure 1**

Table 1

Exclusive Breastfeeding Duration (month)	Total no. of Women		PPA3		PPA6	
	No.	%	No. of Women with PPA≤3 months	PPA>3 months	No. of Women with PPA≤6 months	PPA>6 months
2 – 4	01	02.1	01	00	01	00
4 – 6	20	42.6	11	09	18	02
6 – 8	11	23.4	03	08	11	00
8 – 10	15	31.9	02	13	11	04
Total	47	100.0	17	30	41	06
			36.2%	63.8%	87.2%	12.8%

**Figure 2**

Table 2

Logistic Regression Analysis								
Dependent variable : PPA3								
Independent variable : Exclusive Breastfeeding (EBF)								
-2 Log Likelihood		52.145						
Goodness of Fit		46.457						
	Chi-Square	df	Significance					
Model Chi-Square	9.368	1	.0022					
Improvement	9.368	1	.0022					
Variables in the Equation								
Variable	B	S.E.	Wald	df	Sig	R	Exp(B)	95% CI for Exp(B)
EBF	.5484	.2160	6.4435	1	.0111	.2688	1.7304	(1.133, 2.643)
Constant	-2.6947	1.2516	4.6356	1	.0313			

**Figure 3**

Table 3

<u>Logistic Regression Analysis</u>								
Dependent variable : PPA6								
Independent variable : Exclusive Breastfeeding (EBF)								
-2 Log Likelihood		29.286						
Goodness of Fit		55.776						
	Chi-Square	df	Significance					
Model Chi-Square	6.614	1	.0101					
Improvement	6.614	1	.0101					
Variables in the Equation								
Variable	B	S.E.	Wald	df	Sig	R	Exp(B)	95% CI for Exp(B)
EBF	.5273	.2264	5.4239	1	.0199	.3088	1.6944	(1.087, 2.641)
Constant	-5.7278	1.8716	9.3661	1	.0022			

## DISCUSSION

There is a definite relationship between pattern and interval of breastfeeding and amenorrhoea. Amenorrhoea increases up to certain time with breastfeeding.[5] This study also revealed similar significant relationship. The logistic regression model may prove to be an appropriate choice for studying such relationship. However; unlike linear regression model, it requires careful interpretation. Breastfeeding works as a natural intervention in subsequent conception and therefore, useful in developing biological interventions for family planning programme.

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**References**

1. Tennekoon KH, Wasalathanthri S, Jeevathayaparan S, et.al. Serum leptin and lactational amenorrhoea in well-nourished and under -nourished lactating women. *Fertil steril* 2005; 83(4): 988-94.
2. Zhang LY, Liu YR, Shah IH, et.al. Breastfeeding, amenorrhoea and contraceptive practice among post partum women in Zibo, China. *Eur J Contracept Reprod Health Care* 2000; 7(3): 121-6.
3. Singh G. Regression analysis of the effect of full and partial lactation on post-partum amenorrhoea in lower middle class Indian females. *Indian Journal of Medical Sciences* 1997; 51(6): 181-5.
4. Khadiga AK, Hoda YA, Faten AK, et.al. Determinants of the duration of lactational amenorrhoea among mothers in Alexandria. *Eastern Mediterranean Health Journal* 1996; 2(3): 396-406.
5. Singh KK, Suchindran CM, Singh RS. Smoothed breastfeeding durations and waiting time to conception. *Soc Biol* 1994; 41(3-4): 229-39.

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