Maternal and Neonatal Factors Adversely Affecting Breastfeeding in the Perinatal Period

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Abstract

Background: Despite its known advantages, breastfeeding rates are low world over. Large number of factors affect breastfeeding. This study was designed to detect maternal and neonatal factors that adversely affect breastfeeding in the perinatal period.

Methods: A prospective, single-blinded study was conducted on randomly chosen mother-infant pairs in the maternity ward of a tertiary care service hospital. Only full term singletons born by normal vaginal delivery were studied. The B.R.E.A.S.T observation score and time spent by the infant at the mother's breast were primary outcome variables. Maternal age, gravida, para status and education level were recorded. Birth weight, sex, gestation age of the infant and time interval from birth to observation were also recorded. Initial univariate analysis followed by multivariate analysis was performed using SPSS ver 7.5 software.

Results: A total of 54 mother-infant pairs formed the study group; 19(35.2%) were primigravidas. Primigravidas status of the mother led to significantly lower scores ($p < 0.04$; 95% CI 0.10 to 3.62) as did maternal age < 26 years ($p < 0.04$; 95% CI 0.2. to 3.46) on univariate analysis. Low birth weight (< 2500 g) was the only neonatal factor that significantly lowered breastfeeding scores ($p < 0.02$; 95% CI 0.56 to 6.31). On multivariate analysis only primigravida status was significantly associated with lower scores ($p < 0.02$). The alpha value of the study was 5% and the power was 74%. Time spent by infant on breast was not significantly different between primigravida and non-primigravida mothers.

Conclusion: Primigravida status adversely affects breastfeeding scores; therefore counseling and support should be focused on this group. Extra care should also be taken to ensure adequate breastfeeding by younger mothers and in those with low birth weight infants. Larger studies with long-term follow up will be able to identify other factors and determine the effects of focused counseling and support in the perinatal period upon long-term breastfeeding rates.

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Key Words : Breastfeeding; Primigravida; Counseling

Introduction

Breastfeeding is a natural process that seems to have been adversely affected by the "modernization" of society. Though it is now widely accepted that breast milk is the best for the baby, it is also a well-known fact that exclusive breastfeeding rates in early infancy are still too low [1-3]. A number of studies have shown that deficits in knowledge amongst health workers [1,4,5] and lack of adequate information being given to mothers [6-9] are major factors responsible for low rates of exclusive breastfeeding. Maternal education, race and socio-economic factors are also known to influence breastfeeding decisions [6,10,11].

Deficits in the knowledge of health workers can be bridged by training, which should result in increased breastfeeding rates [12-14]. To translate training into increased breastfeeding rates in a culturally and ethnically diverse population like the Armed Forces, factors adversely affecting breastfeeding have to be identified. Based on these factors breastfeeding

counseling can be more effective and focussed in a tertiary care hospital. This short, prospective study was undertaken to identify factors that adversely affected efficient breastfeeding in the perinatal period.

Material and Methods

Setting

Maternity ward of a tertiary care hospital where routine breastfeeding advice is given during antenatal visits as well as in the perinatal period.

Study design

Prospective, single-blinded, observational study where the primary outcome variables were the B.R.E.A.S.T. observation score and time spent by infant at the mothers breast.

Patient selection: All mothers who were roomed in with their singleton live infants and were in the maternity ward on days chosen by lots over a three month period (10 days in each month) were eligible to enter the study. Only infants delivered by normal vaginal delivery were kept in this ward.

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Exclusion criteria:

- All mothers who were observed on an earlier occasion were excluded from repeat observation.
- After assessment by the observer blinded to mother-infant details, proformas of infants delivered at < 37 weeks by dates were excluded from analysis; i.e. only full term vaginally delivered infants were included in the study.

Method

A single lady observer (NN), who was blinded to maternal and infant details, performed all the observations between 10 a.m. and 5 p.m. on days chosen as described earlier. The observer was allowed to converse with the mother but was not allowed to ask for any maternal or neonatal details. After verbal maternal consent and ensuring that the mother was comfortable, observation was conducted and details recorded on the B.R.E.A.S.T. observation form [15].

Subsequently another worker(SN), recorded maternal and neonatal details on the already filled observation forms. Maternal data recorded included age, gravida and para status and maternal education. Neonatal data recorded were gestational age, sex, birth weight, and time interval from birth to observation. All these variables were obtained from delivery notes and records.

Scoring and analysis:

For each observed correct breastfeeding practice 1 mark was awarded. The maximum possible score was 26. Marks were neither given nor deducted for observed incorrect practices; instead these mothers were counseled and taught the correct method of breastfeeding. Total time spent by the infant at the mother's breast during the observation period was also recorded.

Statistical analysis was done using Statistical Package for Social Sciences (SPSS) software, version 7.5. Initially, univariate analysis was performed to identify maternal as well as neonatal variables that affected breastfeeding practices. The Student t-test was used for continuous

variables while categorical variables were analysed using the Chi square test. Subsequently, factors that significantly affected breastfeeding practices on univariate analysis were entered into a multivariate analysis to determine factor(s) that significantly affected breastfeeding.

Results

A total of 62 mother-infant pairs were observed; of these, the records of 8 (12.9%) were not included for analysis as these infants were born at < 37 weeks of gestation dates. Of the 54 cases forming the final study group, 19(35.2%) were primigravida while 35 (64.8%) mothers had at least one live birth prior to the present one.

The baseline characteristics of the 54 mother-infant pairs in terms of maternal gravida status are shown in Table 1. Primigravida mothers were significantly younger than non-primigravida ones - this was inevitable. Apart from this one variable, there was no significant difference in baseline characteristics between the two groups as shown in Table 1.

The mean B.R.E.A.S.T. observation score was lower in primigravida mothers (mean 17.32, sd 2.79) as compared to non-primigravida mothers (mean 19.17, sd 3.23). This difference was significant with a p value < 0.03 (95% Confidence Interval [CI] 0.16 to 3.55). There was no significant difference between primigravida and non-primigravida mothers in respect of the mean time spent by the infant at the breast (mean time 4.5 min for both groups; sd 2.1 and 2.2 min for primigravida and non-primigravida respectively).

Univariate analysis was performed to determine which other factors apart from the gravida status directly lowered the B.R.E.A.S.T. observation score. A birth weight of < 2500g and maternal age < 26 years were significantly associated with lower B.R.E.A.S.T. observation scores. The complete results of the univariate analysis along with the p values and 95% CI are shown in Table 2.

Multivariate analysis done using a linear model with backward step-wise regression revealed only primigravida status to be significantly associated with lower B.R.E.A.S.T. scores (p value <0.023; alpha 5%; power 74%). Maternal age

Table 1
Baseline characteristics of study group

Variable	Primigravida mothers (n=19)	Non-primigravida mothers(n=35)	p value (95% CI)	Significance
Maternal age [Mean (sd)]	23.16 years (2.39)	26.89 years (3.74)	< 0.001 (1.83 to 5.62)	Significant
Maternal education				
a) <10 class	01	08	0.26	Not significant
b) Passed 10 th	05	08		
c) Passed 12 th	08	15		
d) Graduate+	05	04		
Sex of baby				
a) Female	9	14	0.6	Not significant
b) Male	10	21		
Mean gestational age (weeks ^{+days})	38 ⁺⁵	38 ⁺⁶	0.9	Not Significant
Birth weight (g) [Mean (sd)]	2847.4 (378.4)	3065.6 (450.4)	0.08	Not significant
Age in hours at examination [Mean (sd)]	28.9 (15.2)	36.7 (11.4)	0.054	Not significant

Table 2**Univariate analysis of factors affecting BREAST scores***

Variable	No. of subjects	Mean score	Two tailed P valve (95% CI)	Interpretation
Maternal Gravida status				
a) Primi	19	17.32	0.04	Significant
b) Non-Primi	35	19.17	(0.10 to 3.62)	
Maternal age				
a) <26 years	30	17.73	0.04	Significant
b) ≥ 26 years	24	19.50	(0.20 to 3.46)	
Maternal education				
a) < Class 10	9	19.22	0.47	Not significant
b) ≥ Class 10	45	18.38	(-3.19 to 1.50)	
Birth Weight				
a) <2500 g	5	15.40	0.02	Significant
b) ≥ 2500 g	49	18.84	(0.56 to 6.31)	
Gestational age				
a) ≥ 40 weeks	12	19.08	0.49	Not significant
b) 37-39 weeks	42	18.36	(-1.38 to 2.83)	
Sex of infant				
a) Female	23	17.87	0.2	Not significant
b) Male	31	19.00	(-0.62 to 2.88)	

* t-test was used

<26 years and birth weight <2500g did not significantly contribute to lower scores in the multivariate analysis.

Discussion

Breastfed infants are known to grow optimally, perform better on developmental assessment tests and have lesser allergies and infections as compared to formula fed infants [16-19]. Despite its known advantages, breastfeeding rates are sub-optimal the world over [1-3]. The focus of a large number of workers has been on factors that lead to lower breastfeeding rates. There is enough evidence to show that lack of information for mothers; poor knowledge amongst health workers; underqualified health workers providing advice and the use of didactic lectures adversely affects breastfeeding [1,4,5]. Increasing knowledge and counseling skills of health workers and providing additional written instructions to mothers have been shown to improve breastfeeding rates [3,12,13]. This study did not focus on these issues.

The decision to continue breast feeding or stop it depends upon a variety of factors. These include the mother's intention to breastfeed, the counseling and support received from health workers and peers, the social, cultural and economical background as well as whether the mother works outside home [3,6,7,8,14,20,21]. Identification of factors, both maternal and neonatal, that adversely affected breastfeeding in perinatal period would help us to pay more attention to these 'high risk' mother-infant pairs and provide them more focused counseling and support. This would, in

turn, ensure a good start for the mother-infant pair and result in better breastfeeding rates in the long run.

The perinatal period was chosen deliberately as the effect of antenatal counseling would be maximum during this period. Apart from continuing support from hospital staff, there would be maximum peer support in the post-natal ward. Moreover, the social and cultural influences of the mother's family would not have started to act in full and thus would not have changed breastfeeding practices yet.

Our study revealed primigravida status, maternal age <26 years and low birth weight (<2500g) to adversely affect breastfeeding. Parity is a factor affecting breastfeeding. Mothers breastfeeding for the first time need more support as noted by other workers [8,10,11]. There are dissenting voices too. Murray and co-workers reject any relationship between problems faced by breastfeeding mothers and parity [14]. In a study from Singapore, no association was found between primigravida status and exclusive breastfeeding at 6 weeks age [2]. Lower maternal age and low birth weight are also mentioned in literature as factors adversely affecting breastfeeding rates [10,11,15].

Maternal education, sex and gestational age of the infant and the birth to observation interval did not affect breastfeeding in our study. In a study of age at first breast feed in Shimla, Vatsayan and co-workers reported that maternal education did not have any influence [22] Giovannini and co-workers evaluated 1061 mothers to determine the prevalence of breastfeeding in Italy and failed to find any association between maternal age,

profession, education, rooming-in practices and breastfeeding [9]. Our study population also seems to behave similarly.

Upon entering the variables into a multivariate analysis, only primigravida status was noted to significantly affect breastfeeding; low maternal age and low birth weight did not contribute to the significantly lower breastfeeding scores seen in primigravida mothers. Primigravida mothers will be younger and first born babies are known to be lighter than subsequent ones. Thus, primigravida status, low maternal age and low birth weight are co-related and therefore, on stepwise regression, the latter two variables are weeded out. This is a well known statistical effect and is a major advantage of stepwise regression in that it eliminates misleading findings. A much larger sample size would probably be able to discriminate the individual contributions of maternal age and birth weight, if any, towards breastfeeding [23]. Our study has the drawback that the sample size is small. There might be some criticism about the assumption that identification of risk factors in the perinatal period and their correction would lead to better breastfeeding rates subsequently. This can only be confirmed or refuted by long term follow up studies. Though only primigravida status emerges as a factor adversely affecting breastfeeding it would be prudent to strengthen and focus our breastfeeding counseling and support services on primigravidas, younger mothers and those with low birth weight infants till there is evidence to the contrary.

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