

Stress in Fathers of Premature Newborns Admitted in a Neonatal Intensive Care Unit

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Objective: To study stress in fathers of preterm infants admitted in a neonatal intensive care unit.

Methods: Questionnaire-based study. Questionnaire included domains on infant's health, maternal illness, staff behavior, parental role, home affairs and finances. Eligible fathers were repeatedly interviewed on day 7 ($n=80$), day 17 ($n=59$) and day 27 ($n=28$). Raw and standardized stress scores were calculated.

Results: Financial burden was the main stressor at all times. Stress related to staff behavior and altered parental role reduced with time. Birthweight and father's age, occupation and education independently predicted stress.

Conclusions: Fathers of preterm infants admitted in hospital are stressed, primarily due to financial burden.

Keywords: Neonate, Prematurity, Psychological, Stress.

The care of a premature infant admitted into a Neonatal Intensive Care Unit (NICU) is stressful for the family. Research has primarily focused on mothers and only recently has stress among fathers been studied [1-7]. Reports on parental stress from developing countries and from cultural minorities in Western countries suggest that the causes of stress and responses thereof do not always fit into the Western paradigm [8-10]. We planned this study with the objective of quantifying the stress perceived by fathers of preterm infants requiring NICU care in India.

METHODS

We conducted this prospective cohort study in a level III public sector neonatal unit of Northern India, that caters to a middle-class and lower-middle class population. Very few families have a health insurance or employee health cover. The Institute's Ethics Committee approved the study.

We developed a 67-item Paternal Stress Questionnaire in Hindi language. First, we collated candidate items from a previous questionnaire [11], from inputs by our staff, and from unstructured interviews of parents, and rephrased the items in conversational Hindi language. Secondly, items were removed for inadequate comprehensibility and duplication. Items were rated as 'applicable' or 'not applicable', and 'applicable' items

were rated on a 4-point Likert scale (1: not stressful, 2: mildly stressful, 3: moderately stressful and 4: extremely stressful). Based on a pilot study, we excluded items that >75% fathers considered inapplicable or ambiguous. The remaining 67 items were spread across 6 domains: infant's health, maternal illness, staff behavior, parental role, home affairs and finances (**Table I**). Thirty fathers of normal healthy term infants rated all 67 items as being either 'not applicable' or 'not stressful'. The raw scores of each domain were expressed as Domain-specific Percent Stress Scores (DPSS) of the maximum possible domain score. Mean Percent Stress Score (MPSS) was the arithmetic mean of the six DPSS.

We included fathers of singleton neonates (gestation <35 weeks and birth weight <1501 g) admitted in our NICU for ≥ 5 days. We excluded fathers of neonates with major malformations or terminal illnesses. We conducted the first interview on day 7 and repeated twice at 10-day intervals during hospital stay.

We recorded neonatal demographic data and the following factors: father's and mother's occupation, education and age; family income, duration of marriage, gravidity, number of previous preterm babies, duration of antenatal stay in hospital, and family size.

The key outcome was the MPSS. We recruited a convenient sample size of 80 subjects as there was no

previous similar study for sample size calculation. We compared differences between scores by the appropriate tests for related groups. We assessed the predictors of the MPSS of the first interview by univariate followed by multivariate backward stepwise linear regression.

RESULTS

We interviewed 80 fathers on day 7; subsequently 59 and 28 of them were interviewed on day 17 and day 27, respectively. The declining numbers were due to intervening discharges or deaths. The median (IQR) of fathers' age was 29 (27,34.5) years, family income was Rs. 3000 (1800, 7000), duration of marriage was 3 (1,6) years, gravidity was 2 (1,3), and duration of antenatal hospital stay was 2 (1,5) days. Forty-five (56.2%) fathers were educated beyond 10th grade, 38.4% between 6-10th grade and 9.6% to less than 6th grade. The mean (SD) gestational age of included neonates was 31.0 (1.7) weeks and birth weight 1194.5 (203.4) grams. Within each interview, there were significant differences in the DPSS between domains (**Web Table I**). At each interview, the maximum stress was caused by financial burden.

We compared the first and second interviews among fathers who were available for both interviews (**Web Table I**). Responses were highly correlated ($P < 0.001$).

The total stress score showed a declining trend. Raw stress scores of staff behavior and parental role decreased significantly, and of finances and home affairs showed an increasing trend. When we compared results of all three interviews, stress score of parental role showed significant decline, but the total score were largely unchanged (**Web Table I**).

On univariate analysis, mother's age, father's age, family income, birth weight, educational and occupational status of father were either associated with or had a trend towards association with the MPSS in the first interview (**Web Table II**). On multivariate analysis, father's age, birth weight, father educated to 11-12 grade and father employed as either daily wager or skilled labourer were independent predictors of the MPSS (**Table II**). As mother's age was highly correlated with father's age ($r > 0.8$) on testing for multicollinearity, we dropped mother's age from the model.

DISCUSSION

We found that fathers of very low birth weight newborns admitted to the NICU are stressed due to financial burden, alteration of parental role and concern about home affairs. There was a decline in stress due to staff behavior and alteration of parental role over time, and a

TABLE I SUMMARY OF 67-ITEM PATERNAL STRESS QUESTIONNAIRE IN HINDI

Domain name	Description	No of items	Cronbach's α
Baby health	Appearance and health of baby	21	0.80
Maternal illness	Maternal illness/ ability to care for baby	9	0.63
Staff behavior	Attitude of staff and hospital facilities	16	0.71
Parental role	Alteration of parental role	9	0.80
Home affairs	Neglect of home affairs & other children	6	0.82
Finances	Financial burden	6	0.82

TABLE II MULTIVARIATE LINEAR REGRESSION MODELS OF RISK FACTORS FOR PREDICTING THE MEAN PERCENT STRESS SCORES

Risk factor	Unstandardized coefficient	95% confidence interval	P value
Father's age (y)	-0.009	-0.02, -0.002	0.02
Birth weight (g)	-0.0002	-0.0004, -6.4	0.04
Father's education <6 grade	0.09	-0.06, 2	0.2
Father's education status 6-10 grade	-0.1	-0.2, 0.02	0.09
Father's education 11-12 grade	-0.2	-0.3, -0.04	0.01
Father's occupation daily wager	0.2	0.03, 0.3	0.02
Father's occupation skilled labour	0.2	0.03, 0.3	0.02
Constant	0.862		<0.001

WHAT THIS STUDY ADDS?

- Fathers of preterm infants admitted in neonatal intensive care unit suffer from a great deal of stress: the major stressors being financial difficulties, altered parental role and concern about home affairs.

trend toward increasing stress due to home affairs and finances.

An earlier study among Chinese-American fathers reported stress by the infant's appearance, altered parental role and the health care provider's communication [12]. In another study from Turkey, fathers were stressed by altered parental role [13]. In a longitudinal study on 35 fathers of very preterm infants, the stress scores did not change from day 7 to 35 of life [5]. An altered parental role was a common cause of stress in all the above studies, as well as in our study. However, financial burden, which was an important and progressively increasing cause of stress in our study, was not studied previously. In the absence of universal health insurance and inadequate governmental spending on health, parents make huge out-of-pocket expenditures [14,15]. The independent predictors of stress – occupation, education and age – are also indirectly related to financial well-being. Since stress perception may be influenced by one's cultural background and available social support, the results of this study may not be generalizable to all parts of the world.

We conclude that fathers of premature newborns requiring NICU care face a high degree of stress, the major stressors being financial difficulties, altered parental role and concern about home affairs. Healthcare personnel in NICUs must recognize that fathers of preterm infants go through a lot of stress, and should undertake appropriate measures to ease their stress.

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