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Original Article

Paediatrics Section

Impact of Family Participatory Care on Neonates- A Non Randomised Interventional Study

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ABSTRACT

Introduction: Family Participatory Care (FPC) is a unique concept which involves parents in caregiving to their admitted babies. It helps in defining the family's role in clinical care delivery to newborns along with doctors and nurses. The Neonatal Intensive Care Unit (NICU) is the ideal area for FPC to take place because of the unique and vulnerable nature of the mother-neonate relationship as neonates that are admitted, face immense trials from their first day of life.

Aim: To know the effect of FPC on outcome of admitted neonates, analyse the impact of this model on breastfeeding rate and to compare the rate of Kangaroo Mother Care (KMC) being given to neonates at follow-up.

Materials and Methods: It was a non randomised interventional study done from August 2020 to April 2021, in the NICU at Maharaja Agrasen Medical College, Agroha, Hisar, Haryana, India. Total 200 neonates, who were sequentially admitted and later discharged, were taken into account, out of which, first 100 were taken as controls and next 100 were taken in the intervention group. Routine treatment and care were given to all the admitted neonates. In addition to this, parents of the study group of newborns were given education through four audio-visual sessions, comprising hygiene measures for entry into nursery, correct method of breastfeeding, KMC and then care at home after discharge. Follow-up was done after one week of discharge and at six weeks of age. Outcome measures were breastfeeding rate and KMC rate which were compared between two groups, at discharge and at follow-up of six weeks of age. Data was entered into Microsoft excel and analysed using Statistical Package for Social Sciences (SPSS) version 16.0.

Results: The mean birth weight of neonates, mean gestational age and the socio-economic status were comparable in both the groups. Mean duration of hospital stay was 7.13 (±4.95) days in study group and 8.06 (±5.40) days in control group (p=0.206). Mean weight at discharge and that at six weeks was comparable in both groups. However, the average weight gain per day was significantly higher (25.61 g) in the study group than the control group (18.92 g). At discharge, 92 babies in the control group and 87 in the study group were given exclusive breastfeeding or expressed breast milk with spoon feeding. At six weeks follow-up, this number was 91 in the study group and 70 in the control group (p=0.001). KMC was given to all the neonates at discharge who had birth weight less than 2 kg. Among them, at the time of follow-up, 33/36 in the case group and 5/37 in the control group were receiving KMC (p-value 0.001).

Conclusion: According to the present study finding, the FPC is feasible and effective model in terms of better neonatal outcome.

Keywords: Breastfeeding, Developmental supportive care, Kangaroo mother care, Parents

INTRODUCTION

The Family Participatory Care (FPC) is a new and unique concept that integrates families in care of admitted neonates, along with routine Neonatal Intensive Care Unit (NICU) protocols, by involving family members in Kangaroo Mother Care (KMC), activities of daily living, breastfeeding in the nursery, decision making in treatment and their constant presence beside their neonates during hospital stay. It also provides training for care of baby at home after discharge. Neonatal period establishes a foundation for future health of a child. During hospitalisation, parents bonding may be disrupted due to separation, if baby is born small or sick. FPC plays a role to heal this gap and promote the bonding.

For the care of sick newborns, neonatal units have focused upon provider-centered and technology-driven approach, where parental participation in caring and decision making regarding their own babies is severely limited [1]. In 1970, a transformation in neonatal care management in the NICU began, when the family-centered care model was implemented [2]. In this model, the concept of humanisation became very important to achieve adequate emotional development in the neonates by optimising both the micro-environment (proper pain management, correct postural control and minimal manipulations) and the macro-environment (sound and lighting). These changes lead to a transformation inside neonatal care units, allowing greater similarity to the maternal uterus. During hospital stay, involvement of parents into their newborn's care can maintain infant-parent unity, promote developmental care and facilitate the formation of a healthy attachment [3,4]. Implementation of this model has shown to reduce the duration of stay, improve the final outcomes and enhance infant mother attachment [3,5]. FPC promotes a newer and different concept in the NICU by integrating parents in providing care to their babies, during the entire stay.

This study aimed to analyse the effect of FPC on outcome of neonates admitted in NICU at the study center, a tertiary care hospital in rural area of North India. Furthermore, it was the motive to improve neonate-mother attachment and facilitate better preparedness for newborn care at home.

MATERIALS AND METHODS

It was non randomised interventional study, done in NICU at Maharaja Agrasen Medical College, Agroha, Hisar, Haryana, India, from August 2020 to April 2021. Total 200 inborn neonates, sequentially admitted in NICU, were included in the study. Ethical clearance was obtained

from Institutional Ethics Committee for human research with letter number MAMC/Pharma/IEC/21/22.

Considering the outcome variable of breastfeeding rate from the study of Verma A et al., done in 2017, the proportions in the control group and FPC were 66.7% and 80.4%, respectively [5]. Taking an odds ratio of 2.1, the sample size needed was 300. But due to temporary closure of non Coronavirus Disease-2019 (COVID-19) services and relocation of maximum resources and space, for COVID-19 patients in the hospital during the COVID-19 pandemic, only 200 newborns (100 in each group) could be recruited.

Inclusion criteria: All newborns admitted in NICU during the study period and accompanied by at least two attendants and successfully discharged from NICU were included from the study.

Exclusion criteria: Babies with gross congenital malformation and babies whose parents refused to give consent for the study were excluded from the study.

Study Procedure

The 200 inborn neonates, sequentially admitted in NICU, during first seven days of life, were included in the study. Out of them, the first 100 newborns were controls. They were treated as per protocol, which comprised routine treatment, counselling for exclusive breastfeeding, KMC and guidance to recognise danger signs. Mothers with babies less than 2000 grams were asked to continue KMC after discharge. Next 100 were cases who received FPC as an additional intervention in the form training sessions along with the routine treatment by nurses and doctors as per the NICU policy. For this group, two parent-attendants were identified for each baby and they were sensitised about FPC through an introductory session. Then they were trained in delivering care to their sick neonate using four audio-visual training sessions. First session was about hand hygiene and preparation for entry into nursery. Second session had videos about developmental supportive care and its application. Third session showed information and methods of KMC and technique of hand expression of breast milk. Forth session was about care at home and identifying danger signs.

At discharge, weight, duration of stay and number of infants who were either breastfed or who were given expressed breast milk with katori spoon, were recorded. All babies with weight less than 2000 grams were given KMC in both the groups at discharge. Duration of stay was noted. Follow-up was done in the high-risk clinic at six weeks of postnatal age in both the groups to compare the rates of breastfeeding and KMC. For better comparison at follow-up, as follow-up period was inconsistent, average weight gain per day was calculated.

STATISTICAL ANALYSIS

Data was entered into Microsoft (MS) excel and analysed using Statistical Package for Social Sciences (SPSS) version 16.0. Continuous parametric data was reported as means and standard deviation while categorical data was reported as percentages. Comparison of categorical data between cases and controls was done using the chi-square test. Independent t-test was used to compare continuous data between the two groups. The intragroup change in weight over the interval of six weeks was assessed using paired t-test.

RESULTS

The two groups were comparable with respect to their baseline characteristics of birth weight, gender and period of gestation [Table/Fig-1].

Baseline parameters		Mean (SD)		p-value
		Cases	Controls	
Birth weight of the child (grams)		2285.33 (554)	2314.18 (531)	0.673
Period of gestation (in weeks)		36.30 (2.45)	36.30 (2.61)	1.000
Mode of delivery	Vaginal delivery	51 (51%)	46 (46%)	0.572
	Caesarean section	49 (49%)	54 (54%)	
Gender of delivery	Male	62 (62%)	59 (59%)	0.772
	Female	38 (38%)	41 (41%)	

[Table/Fig-1]: Baseline characteristics of the neonates of the two groups (N=200).

At discharge, 87 neonates in the study group and 92 infants in control group were on exclusive breast feeding or expressed breast milk by katori and spoon. At follow-up, 91 infants in the study group and 70 infants in the control group were exclusively breastfed [Table/Fig-2]. The difference in breastfeeding rates at follow-up was statistically significant (p=0.001) [Table/Fig-2].

Parameters		Cases (%) (N=100)	Controls (%) (N=100)	p-value (Chi-square test)
At discharge	EBF/EBM-KS	87	92	0.357
	Formula feed	13	8	
At six weeks (N=188)	EBF present (n=161)	91 (91%)	70 (70%)	**0.001**
	EBF absent (n=27)	5 (5%)	22 (22%)	

[Table/Fig-2]: Distribution of patients according to the type of feeding. EBF: Exclusive breastfeeding; EBM: Expressed breast milk; KS: Katori spoon; Two infants in study group and four in control group were lost to follow-up at six weeks; four infants in the control group and two in the study group died after discharge

At follow-up, 33 (out of 36 low birth weight) infants of the study group and five (out of 37 low birth weight) of the control group received KMC (p=0.001) [Table/Fig-3]. Mean duration of hospital stay was 7.13 (±4.95) days in study group and 8.06 (±5.40) days in control group (p=0.206). For better comparison at follow-up, average weight gain per day was calculated, which was 25.61 grams in the study group and 18.92 grams in the control group (p=0.001). Two infants in study group and four in control group were lost to follow-up at six weeks. Four babies in the control group and two in the study group died after discharge (p=0.687).

Kangaroo Mother Care (KMC) at six weeks	Cases (%) (N=36)	Controls (%) (N=37)	p-value (Chi-square test)
Administered	33 (91.7%)	5 (13.5%)	**0.001**
Not administered	3 (8.3%)	32 (86.5%)	

[Table/Fig-3]: Comparison of KMC administered to babies with birth weight less than 2000 grams (N=73).

DISCUSSION

The FPC keeps parents in close contact with the admitted neonates, along with ongoing treatment and routine NICU protocols. It involves parents in KMC, cleaning the baby and ensures constant presence beside their neonates during hospital stay and also provides training for care of baby at home after discharge. The aim of this study was to review the effect of this new care model on outcome of newborns. Results showed it to be beneficial in terms of neonatal outcomes. It was also found to be feasible to be implied with minimal extra staff.

Intervention group showed better response in terms of breastfeeding. In 2017 a study was conducted in the New Delhi that also assessed the impact of parental involvement on neonatal care in NICU [5]. The rate of breastfeeding in the intervention group was 119 (80.4%)

as compared to control group 98 (66.7%). Data suggested that the impact of parental participation led to significant improvement in the intervention group's breastfeeding rates. Lv B et al., analysed the outcome of newborns whose mothers were involved in their care for at least four hours in a day in comparison to mothers following the standard practice of hospital in NICU [6]. A total of 139 neonates were exclusively breastfed at discharge in the intervention group as compared to 91 in the control group at the time of follow-up showing significant difference between both the groups. A randomised quantitative study done in Canada in 2013 by O'Brien K et al., documented that the rate of breastfeeding was 82.1% in the intervention group, compared to 45.5% in the control group after implementation of FPC [7].

The study conducted by Zhang R et al., showed that infants in family-centered care group gained more weight and had shorter length of stay as compared to the control group [8]. In the study done in 2011 by Aliabadi T et al., to analyse the effect of family participation in preterm infants care in NICU, the average length of stay in hospital was found to be lesser in the intervention group than the control group [9]. Saunders RP et al., documented reduced length of stay in NICU and better success in breastfeeding as few of the possible gains resulting from a family centred care approach in NICU [10]. Ramezani T et al., reviewed the existing literature and stated that as a result of FPC, decreased hospitalisation duration was seen as one of the many benefits [11].

The study documented a significant impact of the intervention on the number of infants who were provided KMC at home after discharge, when they were assessed at follow-up. Average weight gain per day was better in the intervened group suggesting the KMC as a good tool and also that it was performed appropriately. A study by Trajkovski S et al., about FPC in NICU as a method to provide healthcare for neonates, also concluded that FPC helped in successful performance of KMC plan [12].

As FPC model was feasible in NICU setting of rural India and beneficial outcomes were observed, it is recommended to be implemented at all centers. This concept needs further acceptance at the level of parents and healthcare providers as more large population-based trials are desired.

Limitation(s)

Beneficial effects of implementation of this model were obtained but the effects on rate of nosocomial infections after allowing parents in NICU and parent's perception towards the initiative were not studied. Also, sample size was less due to allocation of resources to COVID-19 services.

CONCLUSION(S)

The study aimed to familiarise the caregivers with FPC and observe the impact on neonates after implementation of this model. Positive outcomes were obtained in the terms of rate of breastfeeding, weight gain and rate of KMC. In addition to routine advice, parents were also provided knowledge of treatment given to their neonate, correct methods to perform activities of daily living and basic ways of recognising danger signs such as hypothermia, seizures or lethargy. In addition to emphasising the value of FPC, this study adds to the fact that FPC is also feasible with minimal additional infrastructure and even in the rural regions.

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