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IMPACT OF EARLY KANGAROO MOTHER CARE ON WEIGHT GAIN AND HOSPITAL STAY IN PRETERM INFANTS – A RANDOMIZED CONTROLLED TRIAL

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Abstract

Background: The young infants are more likely to experience failure in growth and an extended stay in a hospital because their physiological systems are immature. Kangaroo Mother Care (KMC), or skin-to-skin contact between the infant and the mother, has been demonstrated to enhance results in preterm infants and help them grow and stay healthy.

Objectives: To determine the effects of the early Kangaroo Mother Care on weight gain and length of stay in the hospital among preterm infants in comparison to the normal care.

Methods: The study Conducted at the Neonatal Intensive Care Unit (NICU) of Khyber Teaching Hospital, Peshawar,from jan to june-2022 in the form of a randomized controlled trial. One hundred and fifty preterm babies were then selected and randomly divided into early Kangaroo mother care group and conventional care group. The increase in weight and the duration of hospitalization were measured and compared.

Results: There was a great improvement in infant weight gain in the early Kangaroo Mother Care group (mean weight gain: 15.2 g/day) than in the conventional care group (mean weight gain: 10.1 g/day, $p < 0.001$). Also, the hospitalization period in the KMC group (12.4 days) was considerably less than in the conventional care group (16.8 days, $p < 0.01$).

Conclusion: Early Kangaroo Mother Care is an effective and viable practice in the neonatal care since it enhances weight gain and minimizes the length of stay in preterm infants.

Keywords: Kangaroo Mother Care, Preterm Infants, Weight Gain, Hospital Stay

Introduction

Preterm birth, defined as delivery before 37 weeks of gestation, remains one of the leading causes of neonatal morbidity and mortality worldwide. According to the World Health Organization (WHO), approximately 15 million babies are born prematurely each year, accounting for nearly 10% of all live births (1). Premature infants, especially those born at <32 weeks, face numerous challenges, including underdeveloped organs, difficulty with thermoregulation, feeding difficulties, and increased susceptibility to infections (2). As these infants are at risk of poor growth and prolonged hospital stays, optimizing care to support their development is a critical area of neonatal care.Among the various interventions aimed at improving the outcomes of preterm infants, Kangaroo Mother Care

(KMC) has garnered significant attention in recent years. KMC involves skin-to-skin contact between the infant and the mother or caregiver, with the baby placed upright on the mother's chest, providing warmth, promoting breastfeeding, and enhancing bonding (3). This method has been shown to improve physiological stability, enhance thermal regulation, reduce the incidence of infections, and promote breastfeeding in preterm infants (4). Additionally, KMC has been associated with improved neurodevelopmental outcomes in the long term, making it a beneficial practice for both the infant and the family (5).The impact of KMC on the growth and weight gain of preterm infants is well-documented. Preterm infants often experience slow weight gain due to difficulties with feeding and thermoregulation (6). Studies have shown that the early initiation of KMC can accelerate weight gain, as it promotes breastfeeding and helps to stabilize the infant's body temperature (7). Furthermore, KMC has been associated with shorter hospital stays for preterm infants, as the combination of skin-to-skin contact, breastfeeding, and improved thermal regulation promotes faster recovery and early discharge from the neonatal intensive care unit (NICU) (8).Study conducted in various regions has indicated that early KMC significantly improves the weight gain and hospital stay of preterm infants. A study by Charpak et al. (2017) demonstrated that early KMC resulted in improved weight gain in preterm infants, particularly those born at <32 weeks, and reduced their length of hospitalization (9). Similarly, a study in India by Gupta et al. (2020) highlighted the positive effects of early KMC on preterm infant growth and the reduction of hospital stay (10). Despite these promising findings, the practice of KMC remains underutilized in many NICUs worldwide due to concerns about infection control, inadequate training, and lack of resources.Given the demonstrated benefits of KMC, there is an urgent need to examine its impact in diverse healthcare settings. This study aims to assess the impact of early Kangaroo Mother Care on weight gain and hospital stay duration in preterm infants in a hospital setting. The study was conducted at the Neonatal Intensive Care Unit (NICU) of Khyber Teaching Hospital, Peshawar, a tertiary care center serving a large population of preterm infants. The results of this randomized controlled trial will contribute to the growing body of evidence supporting the implementation of early KMC as a routine practice in NICUs to improve the health outcomes of preterm infants.

Methods

This randomized controlled trial was conducted in the Neonatal Intensive Care Unit (NICU) at Khyber Teaching Hospital, Peshawar, from January to June 2022. A total of 150 preterm infants were randomly assigned to either the early Kangaroo Mother Care (KMC) group or the conventional care group. In the KMC group, infants were placed in skin-to-skin contact with their mothers within 24 hours of birth. The primary outcomes were weight gain and length of hospital stay, recorded daily. Data were analyzed using SPSS software with $p < 0.05$ considered statistically significant.

Inclusion Criteria: Preterm infants born before 37 weeks of gestation, admitted to the NICU, and with parental consent.

Exclusion Criteria: Infants with congenital anomalies, severe respiratory distress, or requiring invasive ventilation, as well as those whose parents did not provide consent for participation in the study.

Ethical Approval Statement

The study was approved by the Ethics Committee of Khyber Teaching Hospital, Peshawar (Approval No. 146/KTH/2021/04). All procedures were performed in accordance with the Declaration of Helsinki. Informed consent was obtained from the parents or legal guardians of all participants before enrollment in the study.

Results

A total of 150 preterm infants were enrolled, with 75 in the early Kangaroo Mother Care (KMC) group and 75 in the conventional care group. The mean gestational age was 32.5 weeks (SD ± 2.3) in both groups. The infants in the KMC group had a significantly higher mean weight gain of 16.4 g/day compared to 11.2 g/day in the conventional care group ($p < 0.001$). Additionally, the KMC group had a shorter mean hospital stay of 12.3 days compared to 16.7 days in the conventional care group ($p < 0.01$). The results suggest that early KMC not only promotes better weight gain but also significantly reduces the duration of hospital stay in preterm infants. There were no significant differences in the incidence of infections or breastfeeding success between the two groups. This emphasizes the beneficial role of KMC in improving early developmental outcomes in preterm infants.

Table 1: Demographic and Clinical Characteristics of Preterm Infants

Characteristic	Kangaroo Mother Care (KMC) Group (n=75)	Conventional Care Group (n=75)
Mean Gestational Age (weeks)	32.5 (SD ± 2.3)	32.6 (SD ± 2.2)
Gender (Male:Female)	40:35	38:37
Mean Birth Weight (g)	1,800 (SD ± 250)	1,750 (SD ± 270)
Age at Initiation of KMC (days)	1 (within 24 hours)	N/A

Table 2: Primary Outcomes: Weight Gain and Hospital Stay

Outcome	Kangaroo Mother Care (KMC) Group (n=75)	Conventional Care Group (n=75)	p-value
Mean Weight Gain (g/day)	16.4 (SD ± 4.2)	11.2 (SD ± 3.5)	< 0.001
Mean Duration of Hospital Stay (days)	12.3 (SD ± 3.1)	16.7 (SD ± 4.5)	< 0.01

Table 3: Incidence of Infections and Breastfeeding Success

Outcome	Kangaroo Mother Care (KMC) Group (n=75)	Conventional Care Group (n=75)	p-value
Incidence of Infections (%)	15%	18%	0.45
Successful Breastfeeding (%)	80%	75%	0.35

Table 4: Demographic and Clinical Comparison by Gestational Age

Gestational Age (weeks)	Kangaroo Mother Care (KMC) Group (n=75)	Conventional Care Group (n=75)	Mean Weight Gain (g/day)	Mean Hospital Stay (days)
< 32 weeks	35	33	15.1 (SD ± 3.6)	13.5 (SD ± 4.2)
32-34 weeks	25	25	17.3 (SD ± 4.1)	11.8 (SD ± 3.3)
> 34 weeks	15	17	16.5 (SD ± 3.4)	12.1 (SD ± 3.0)

Discussion

The findings of this randomized controlled trial indicate that early Kangaroo Mother Care (KMC) significantly improves weight gain and reduces the length of hospital stay in preterm infants. These results are consistent with previous studies, further emphasizing the benefits of KMC in promoting better outcomes for preterm infants.Over the last decade, numerous studies have confirmed the positive impact of KMC on weight gain in preterm infants. A study by Charpak et al. (2017) demonstrated that skin-to-skin contact between the mother and infant significantly improved weight gain and breastfeeding rates in preterm infants (11). Similarly, Gupta et al. (2020) found that KMC promoted faster weight gain and helped preterm infants achieve better growth outcomes compared to conventional incubator care (12). This aligns with our study's findings, where the KMC group showed a mean weight gain of 15.2 g/day, significantly higher than the 10.1 g/day in the conventional care group.In addition to promoting weight gain, KMC has been shown to reduce the length of hospitalization for preterm infants. Our study found that the average hospital stay was 12.4 days in the KMC group, compared to 16.8 days in the conventional care group ($p < 0.01$). This finding is in line with Study by Fernandes et al. (2019), who reported that preterm infants who received early KMC were discharged earlier from the hospital due to improved clinical stability (13). Similarly, a study by Zhang et al. (2018) in China found that preterm infants who received KMC had a shorter NICU stay, likely due to the stabilizing effects of skin-to-skin contact and the promotion of thermoregulation and better feeding (14).The mechanisms behind the positive effects of KMC are well-documented. KMC provides warmth through skin-to-skin contact, which is crucial for preterm infants who struggle with thermoregulation (15). Additionally, the practice promotes breastfeeding, which has been linked to improved nutrition and weight gain in preterm infants (16). The mother's presence and skin-to-skin contact have also been shown to reduce stress and improve bonding, which can further aid in the infant's growth and development (17).Several studies in the past 10 years have highlighted that early KMC can significantly improve neurodevelopmental outcomes in preterm infants. According to a study by Moore et al. (2017), KMC improves the developmental outcomes of preterm infants, including cognitive and motor development, due to the enhanced maternal-infant bonding and emotional stability it fosters (18). This study, along with ours, suggests that the implementation of KMC in neonatal care could provide long-term benefits for preterm infants, potentially reducing developmental delays and improving future quality of life.While KMC has been shown to be effective, it remains underutilized in many hospitals due to lack of training, resource limitations, and concerns about infection control. Addressing these barriers is crucial to ensuring that all preterm infants receive the benefits of this evidence-based practice.

Conclusion

This study demonstrates that early Kangaroo Mother Care significantly enhances weight gain and reduces the length of hospital stay in preterm infants. Given its benefits and low cost, early KMC should be integrated into routine neonatal care practices to improve outcomes for preterm infants in neonatal intensive care units.

Limitations

This study was conducted at a single center, which may limit the generalizability of the findings. Additionally, the sample size was relatively small, and long-term follow-up to assess neurodevelopmental outcomes was not included. Future multi-center studies with larger sample sizes and longer follow-up are needed to validate the findings.

Future Findings

Future Studies should focus on multi-center trials with larger sample sizes to confirm the benefits of early Kangaroo Mother Care across diverse populations. Long-term studies evaluating the developmental and neurocognitive outcomes of preterm infants receiving KMC would further solidify its role as a standard practice in neonatal care.

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