



Research Article

KANGAROO MOTHER CARE: A BASIC NECESSITY OR JUST AN ADJUNCT

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ABSTRACT

Introduction- Preterm birth is a significant public health problem associated with neonatal mortality and short and long term disability in later life. Majority of preterm babies delivered in Bihar who need admission come to NICU, PMCH. Kangaroo mother care (KMC) is administered in selective patients, by evaluating the quality and coverage of this technique we can get an idea of utility of KMC in the population we serve and administer this to.

Aims & Objectives -To determine survival rate in preterm/LBW neonates receiving KMC and not any significant difference in weight gain and difference in duration of hospital stay in patients given KMC and those not.

Materials & Methods- A retrospective analytical hospital based study from March 2021-March 2022 in 204 neonates. The Inclusion criteria were as follows 1) Newborn less than 2500 grams 2) Who were found to be hemodynamically stable after initial treatment. Exclusion criteria were as follows 1)weight more than 2500gms 2)those neonates who are found to be hemodynamically unstable, with seizure, with severe respiratory distress 3)any known or suspected chromosomal abnormalities 4)babies with cyanotic congenital heart disease.

Results- Weight gain in average -At start of KMC was 1 kg at 1 week was 1.2 kg at discharge was 1.6 kg .Survival rate was 82% in the group receiving KMC and for other group was below 50%. In those not given KMC, we found delayed weight gain, in fact weight loss during hospital stay, feeding difficulties and reaching discharge criteria at an average of 45 days of admissions.

Conclusion- KMC is a necessity and should be used judiciously in neonates who need it.

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INTRODUCTION

About 20 million low birth babies are born every year. Babies are said to be preterm when they are born before 37 completed week of gestation or born before 259 days of gestation since the woman's last menstrual period(LMP).⁽¹⁾In India, 25 million babies born every year⁽²⁾. Percent of newborn born with weight < 2.5 kg is 18.2% (Bihar -14.4%)⁽²⁾. Neonatal deaths account for 30 deaths per 1000 live births. This means that one in 33 live births died during neonatal period(Bihar=36.7)⁽²⁾ percents of all deaths among children under 5 year of age. Preterm birth is the world's number one cause of neonatal deaths. Preterm birth is a significant public health problem worldwide because of associated neonatal (first 28 days of life) mortality and short and long term morbidity and disability in later life.

- Kangaroo mother care is a cost-effective, comprehensive, developmentally supportive therapy for hospitalised preterm infants and low birth weight Neonates⁽³⁾

- In our neonatal ICU prematurity is one of leading cause of neonatal death and it causes unduly emotional and financial burden on mother and family.
- A simple and cost effective method, Kangaroo mother care is being used in our neonatal icu and various higher and lower setup to provide care in addition to medical and conventional neonatal care to preterm neonates.
- This study is to determine whether and how much impact kangaroo mother care (KMC) has in reducing mortality and reducing hospital stay to support its use in neonates specifically preterm and low birth weight neonates after initial period of stabilization.

As preterm and low birth weight babies make a leading cause of death in Bihar and also in our setting, a statistical evaluation and significance of kangaroo mother care over the conventional method care is needed. As the study place is a tertiary care centre with majority of preterm and Low birth weight babies of Bihar especially the underprivileged population who need cost effective yet effective way to prevent morbidity and mortality in these population leading to

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reduction in overall Neonatal and infant mortality rate of Bihar. By evaluating the effectiveness and coverage of this intervention in form of KMC we can get an idea of utility of kangaroo mother care in the population and result of which can be generalised to the overall population.

REVIEW OF LITERATURE

Globally, about 15% of new born are born with a low birth weight (LBW) as a result of preterm birth or intrauterine growth restriction or both, and 60-80% of deaths in neonatal period occur in these LBW infants.⁽⁴⁾ These new born have immature lungs, brain, gastrointestinal tract and skin. The cause of death among LBW infants include respiratory and brain complications, hypothermia, hypoglycaemia and infection.⁽⁵⁾

For the routine care of low birth weight and preterm neonates the "WHO recommends KMC as intervention to improve birth outcome, initiated as the newborns are clinically stable."⁽⁶⁾

A recently updated Cochrane review reported 40% lower mortality in infants with a birth weight of less than 2.0 kg who were given standard care in hospitals at 40-41 weeks of gestation (3.2 % versus 5.3%; risk Ratio(RR) 0.60, 95% confidence interval (CI) 0.39 to 0.92; eight trials, 1736 infants.⁽⁷⁾ This also showed improvement in exclusive breastfeeding, shorter hospital stay.⁽⁸⁾

A prospective cohort follow up study done at Department of Neonatology in Mumbai shows that with increase in duration of KMC the anthropometric parameters improved. In preterm babies although there was a significant ($p < 0.01$) difference of birth weight at entry point but at corrected date of birth, smaller babies gained significantly more weight ($p < 0.028$) and at CDOB the weight of all babies were comparable.⁽⁹⁾

In the RCT from South Africa,⁽¹⁰⁾ SSC from birth was associated with 100% stability scores in the fifth to sixth hour of life as compared with 46% in the conventional care group in newborns weighing 1.2-2.2 kg.

Objective

1. To determine survival rate in preterm and low birth weight neonates receiving kangaroo mother care.
2. To determine any significant difference in weight gain in patients given Kangaroo mother care and those not given.
3. To evaluate any significant difference in duration of stay in hospital.

MATERIALS AND METHODS

This retrospective analytical study was undertaken in NICU Department of Paediatrics in a Tertiary care centre PATNA MEDICAL COLLEGE and data obtained from NICU data base record.

Study design

Retrospective analytical study

Study period

The study duration was from March 2021 to March 2022.

Inclusion criteria

- all Inborn and outside born babies less than 2500 g.

Exclusion criteria

- a) weight more than 2500g.
- b) Those neonates who are found to be hemodynamically unstable, with seizure, with severe respiratory distress.
- c) Any known or suspected chromosomal abnormalities and life threatening congenital abnormalities.
- d) Babies with visible cyanosis and obvious cyanotic congenital heart disease.
- e) Caregiver not giving consent.

Kangaroo mother care was started in newborns who are stable and no risk were anticipated perse of the procedure. Caregivers were first trained for kangaroo mother care and on how to maintain asepsis and feeding technique. All mothers were counselled to provide Kangaroo mother care for maximum possible duration in a day at hospital and also for home care.

For purpose of our study we divided the study group in groups as per our outcome.

The first group was based on the timing of start of KMC. For which we further divided the cohort in 4 subgroups.

1. Those where KMC was started within 24 hour of admission (not necessarily birth)
2. KMC started within 72hour
3. KMC started within 1 week
4. After 1 week of admission.

The second group in our study was on the basis of weight gain. This was the group which made a comparison group with the cohort not receiving KMC. We divided this group with serial weight measurement and categorising in 3 groups.

- 1) weight at start of KMC and baseline weight gain for all LBW neonate irrespective of being candidate for KMC or not.
- 2) weight at 1 week after start.
- 3) weight at discharge.

The third group as our objective was to determine survival rate in both groups. For the purpose of study we made three subgroups-

1. Death within first 72 hour
2. Death between 72 hour of initiation till 1 week
3. Death after 1 week.

The fourth group being the outcome of our study in terms of Hospital stay. Here we compared the duration of stay of LBW neonates who are subjected to KMC and those who were not. A well designed case control study where we can have a comparison group with matching done in between the 2 groups cannot be obtained as giving KMC to half neonates and not giving to the other half with similar condition and without any medical complication related contraindication is not possible as it was not ethical.

The impact of KMC on survival and duration of hospital study was explored in these high risk LBW and Premature neonates. This giving us a idea of the coverage and quality of this cost effective methods for neonatal care in comparison to conventional method of care. KMC is the method of care over the conventional method of care in India as well outside India for so long with introduction of KMC practice in 1999. And most of the centre in India adopted this in early 2000 due to

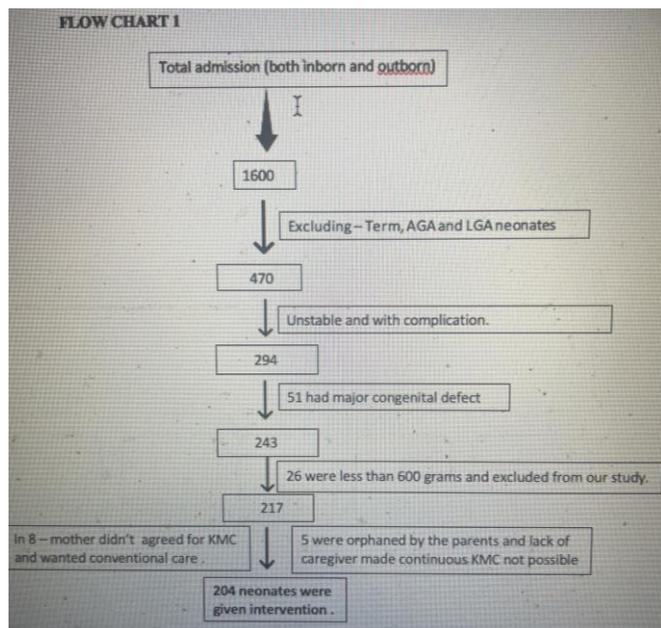
limited infrastructure. The study gave us a important data on benefit and coverage of this technique on our state level.

Statistical analysis was done by SPSS version 16 . P value of <0.05 is considered significant.

RESULT AND DISCUSSION

There were total 1600 admission in our NICU during the study duration of march 2021 to march 2022. Out of which total death was 612. Out of total 1600 admission total Premature and LBW neonate were 470 with/without other complication. Out of these 470, around 176 were hemodynamically unstable with one or more medical complication. In about 51 cases, major fatal congenital defect were found making them unfit for initiation of KMC. 26 were 600 grams and below making them unviable and with death within 24 hour of birth. Flow chart of neonates included and excluded is shown in figure 1. For all those given KMC the idea was to provide initial stabilisation for first 24 hour of life (admitted on day 1 of life)and train the mother or caregiver regarding the purpose and technique of KMC. KMC was not initiated in any group within 24 hour of life(usually inborn admitted at birth) regardless of complication and general conditions but for those admitted later in life we have initiated the technique even within 24 hour of admission based on the general condition of the babies.

Flow Chart 1



The median time for initiation of KMC in these neonate were divided in 3 category

- within 24 hour of admission
- Within 72 hour of admission
- Within 1 week of admission
- After 1 week of admission.

Further we charted the weight gain as recorded on weighing scale at 00 calibration with early morning naked weight was taken. The weight gain in these study group was divided in 3 category to show the primary outcome of out study. Table 1 and Table 2 show the result as described.

Table 1 shows the distribution of subjects on the basis of

Within 24 hour	Within 72hour	Within 1 week	After 1 week
34	74	49	47

Table 2 Average weight gain in cohort

Weight at time of enrolment	Weight at end of 1 week	Weight at time of discharge
1000 g	1348 g	1656 g

The next objective of our study was to compare the survival and mortality in study group with those not included. Within 28 days of life for those in whom KMC was given survival was 82%, 36 out of 204 neonates died even with enrolment in KMC. The death was maximum in 24- 72 hour owing to undiagnosed heart disease presenting late after closure of ductus arteriosus and complication of prematurity primary being hypothermia and intracranial haemorrhage. KMC stopped noticing the danger signs and started treatment for the same. Second cause of death reported mainly due to infection and recurrent apnea for which treatment initiated early but unfortunately the babies scummed to death even before the response to treatment. In table 3 we have tabulated the data. For the other group in whom not given and sticking to conventional method of care 144 out of 266 died within 28 days of birth including both preterm and low birth weight with 87 death within 24-48 hour of admission as per the child death report available in our NICU record. Risk ratio being 0.35; means an RRR of 65% . This mean reduction in relative risk of the specified outcome in study cohort.

When weight gain was charted the average weight at start of KMC was 1000g (CI - 1.075 ±0.0862)and after 1 week of enrolment weight gain was measured to be an average of 1348 g [CI- 1.35 ± .085]. At time of discharge average weight in the study group was 1656g (CI - 1.66 ±.070)

Table 3 shows comparison between the two group

Intervention group			Exclusion group		
Total	Discharged	Death	Total	Discharged	Death
204	168	36	266	122	144

The next outcome calculated was duration of stay in study group and the excluded group. Average stay duration in those given KMC was 21 days and in those given conventional care was 45 days and more but this result cannot be solely contributed to the the intervention as the excluded group have some associated medical or surgical complication for which longer treatment were needed and caused difficulty in adequate and timely establishment of feed leading to late weight gain and late discharge.

For the 13 cohort who were initially selected for intervention but cannot be given because of withdrawal of consent and not availability of the caregiver to provide KMC ,only 1 casualty was reported but the weight gain was delayed and late discharge at around 50-60 days was noticed . Table 4 show the result.

Table 4 Shows duration of hospital stay

Cohorts	Range	Average
Intervention Group	15-30 days	21 days
Exclusion Group	30-60 days	45 days
initially included but excluded Later(13)	50-60 days	55 days

CONCLUSION

The initiation of continuous kangaroo mother care soon after initial stabilisation and in infants with weight more than equal to 800 showed improved survival, early weight gain lower risk of hypothermia and low sepsis. This leading to early discharge reducing hospital acquired infection and other hospital related complication. Also seen that mother and parent giving KMC in hospital setting are more confident in taking care of their newborn and at home with appropriate care. Also it gave confidence to mother for breastfeeding and with satisfaction for suffice of breastfeeding owing to the appropriate weight gain in neonate decreasing the risk of mixed feed and bottle feed which can further be a cause of mortality itself in infancy with overall survival of around 80% after initial stabilisation this approach is highly recommended. The primary outcome being the survival and early discharge, the study showed decreased mortality and early discharge (95% CI). Overall the incidence of hypothermia was 5% and 11% respectively in study group and excluded group (risk ratio, .45%; 95% CI). Sepsis reported in 13% in study group with 2.4 % death (total 5 death). In excluded group total sepsis related mortality was 18% (total 26 death) but statistical significance for this data could not be established as p value was >0.05%.

Overall kangaroo mother care is proven to a well defined, cost effective method of care benefiting mother and child in better survival, early discharge leading to reducing financial and emotional burden on the family. Overall reducing mortality risk of sepsis, hypothermia and hypoglycaemia owing to early and chance for mother especially primi mother to learn the adequacy and way to provide appropriate breastfeeding to the infant. This can overall lead to better post discharge care and better coverage of breastfeeding after discharge (for proven statistical significance of this we needed a follow up study which is not included in our study).

The result as far was promising enough to be generalised to all resource limited setup.

Limitations to Our Study

There are some limitations which needs to be discussed. As we don't have a matched control group the survival cannot be merely contributed to the continuous Kangaroo mother care.

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