SHORT COMMUNICATION

Long Distance Neonatal Transport- The Need of the Hour

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Manuscript received: January 7, 2008; Initial review completed: February 18, 2008; Revision accepted: February 27, 2008.

ABSTRACT

This study compares the inter hospital long distance transports undertaken by a qualified transport team versus those done by other means. This was a retrospective descriptive comparative study of the neonatal transports done during a period of 33 months from various maternity and pediatric centers to a pediatric tertiary referral centre. We found that biochemical and temperature disturbances are more common in babies transported on their own and a specialized neonatal transport service could improve the survival of these babies. Survival was 96.2% (154/160) and 89% (114/128) in the two groups, respectively (P=0.03).

Key Words: *Long distance transport, Neonatal transport, Transport team .*

INTRODUCTION

Neonatal transport is an evolving concept in the Indian scenario. In utero transfer is the safest transfer but unfortunately, preterm delivery, perinatal illness and congenital malformations cannot always be anticipated, resulting in a continuing need for transfer of babies after delivery(1). These babies are often critically ill, and the outcome is partly dependant on the effectiveness of the transport system(2) .

Most of the transfers in India are done by the source hospital by utilizing private ambulances and semi-trained or ill-trained personnel. With less experienced staff, the risk of adverse events on such transports can be greater than with well-equipped and trained staff(3-5). Many of the babies transported in this way are cold, blue and hypoglycemic and 75 % of babies transferred this way have serious clinical complications(6-8).

METHODS

We have developed a transport system and regularly transport babies from in and around 250 km of Hyderabad. Our transport is primarily by road and by using an ambulance specifically designed for the same purpose. The Group I constituted babies transported to our hospital from outside the municipal limits of Hyderabad up to a radius of 250 Km from Hyderabad by our retrieval team over a period of 33 months from July 2004 to March 2007. These babies were compared with babies transported from the referral units on their own during the same period (Group II). Babies in Group II were transported either by paramedical personnel in private ambulances or by relatives through their own vehicles or by other means.

Data regarding the transport was taken from the transport sheets and the case sheet based on the details filled in by the transporting staff. All the details regarding the time and distance were reconfirmed from the ambulance records. Data regarding the babies who came on their own were retrieved from the case sheets and were confirmed with the emergency admission register. Gestational age of the baby was noted from the records and confirmed by modified Ballard's score. Outcome was recorded based on whether the babies survived, died or left against medical advice. We compared temperature on arrival, blood sugar, oxygen saturation, duration of stay, outcome and, biochemical and clinical abnormalities(9) between the two groups. Statistical analysis was done using the Wilcoxon- Mann-Whitney test and *P* value <0.05 was taken as significant.

TABLE I DISEASE PROFILE OF BABIES TRANSPORTED*

Diagnosis	Group I (*n*=160)	Group II (*n*=128)
Prematurity	82	76
Hyaline membrane disease	62	22
Sepsis	32	54
IUGR	8	8
Large for gestational age	2	2
PPHN	12	2
Meconium aspiration syndrome	6	4
Birth asphyxia	16	16
Surgical	8	8
Miscellaneous	36	48

** Some babies had multiple problems; IUGR: Intrauterine growth retardation; PPHN: Primary pulmonary hypertension in newborn.*

TABLE II BABIES WITH ABNORMAL PARAMETERS AT ARRIVAL*

Babies with	Group I (*n*=160)	Group II (*n*=128)	*P* value
Hypoglycemia	2 (3.2%)	16 (20.5%)	<0.01
Hyperglycemia	7 (11.2%)	16 (20.5%)	0.02
Hypothermia	2 (3.2%)	30 (38.4%)	<0.01
Hyperthermia	4 (6.4%)	12 (15.3%)	0.02
Low oxygen saturation	3 (4.8%)	17 (21.7%)	<0.01
Apnea	0	4 (6.4%)	0.03

** Some babies had multiple problems*

RESULTS

Preterm babies constituted majority of the transfers, most of them had hyaline membrane disease and were referred for mechanical ventilation or were in distress with high oxygen. The babies with less than 32 weeks of gestational age constituted negligible proportion of babies in the group II (7.8%) as compared to the Group I (21.2%) (*P*=0.006). Both the groups were comparable for babies who required ventilation. 96.2% (154/160) of babies who were transported survived as compared to 89% (114/128) of babies who came on their own (*P*=0.03).

The incidence of hypoglycemia, hypothermia, hyperthermia, hypoxia and apnea were significantly more in babies who had come on their own (***Table* II**). Hypoglycemia in the transported group was a result of a malfunction of the infusion pump. Two babies had hypothermia in the Group I due to a power failure in the ambulance. Three babies had hypoxia in the Group I out of them two babies had severe PPHN and one had cyanotic CHD. Four of the babies (5.1%) in the Group II were apneic or were gasping on admission. None of the babies transported by the team were found to be apneic or gasping on admission.

DISCUSSION

Neonatal transfers between level 1 and level 2 units to a level 3 unit is a common occurrence. Neonates have special requirements and need to be transferred in specially equipped vehicles and by adequately trained personnel. Babies who were transported had a good survival rate as compared to the babies who had come on their own. They had lesser incidence of hypoglycemia, hyperglycemia, hypothermia or hyperthermia on admission. The incidence of hypoxia or apnea was also lessened by the presence of a good transport team. Unfortunately we could not get accurate data as to the mode of transport in the babies who had come on their own as it was not documented in most of the instances. We could not see if transport by paramedical personnel in a private ambulance was better than that done by the relatives.

In a comparative similar study by Sharples, *et al.*(10), critical events occurred in a third of all transfers undertaken by a non-specialist team. 8% of these babies were found to have arterial saturation below 90 % as compared to our study where 22% were hypoxic. More than 50% of children were in cold stress on admission(10). The results of our study were also similar to a study by Chance, *et al.*(11) in babies less than 1500 g, which found that babies who were transported by an expert team were significantly warmer and had better survival.

As the sample size was less and it was a retrospective study, a prospective study enrolling babies in high numbers for definitive recommendations needs to be planned.

Contributors: CDK conceived and designed the study and would act as the guarantor, PPK was responsible for

WHAT THIS STUDY ADDS?

- A specialized neonatal transport service could improve the survival rates and decrease the temperature and biochemical abnormalities in referred newborn infants.

collection of data, analysis of the data and drafting the paper, AVL participated in protocol development and helped in drafting the paper. The final manuscript was approved by all the authors.

Funding: None.

Competing Interests: None stated.

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