COMPARISON OF LATE NEONATAL SEPSIS IN BREAST FED AND BOTTLE FED INFANTS ADMITTED TO KHYBER TEACHING HOSPITAL, PESHAWAR, PAKISTAN

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ABSTRACT

BACKGROUND: Infections are frequent and important causes of morbidity and mortality in the neonatal period. Late-onset infections, occurring after one week of life, are acquired in the normal newborn nursery, neonatal intensive care unit (NICU), or the community. The associated factor of late-onset sepsis causing deaths includes lack of breastfeeding among others. Feeding colostrum and breast feeding, especially exclusive breast feeding, protects against such deaths. The objective of this study was to compare the frequency of late neonatal sepsis in breastfed and bottle fed infants.

METHODS: This cross sectional study was conducted over a period of six months, from April 8, 2009 to Oct 7, 2009. Receiving patients from both outpatient department and emergency. 246 cases of full term infants aged 7-28 days with suspected late neonatal sepsis were selected from Neonatology unit of Pediatric department, Khyber Teaching Hospital, Peshawar through non probability purposive sampling. Cultures from blood, urine, CSF and umbilicus in all cases and pleural fluid in selective cases were taken or confirmation of sepsis. Feeding practices of neonates were noted. Mean ,standard deviation, frequencies and percentages, odd ratios with 95% Confidence Intervals were calculated for selective variables while Chi square test was applied using SPSS version 14.

RESULTS: Out of 246 infants with late neonatal sepsis, 140 (57%) were males and106 (43%) females. Mean age was 16.75 days (SD ±5.93); 222(90%) were bottle fed while 24(10%) were exclusively breast fed. Among bottle fed 128(57.6%) were confirmed as having neonatal sepsis while in breast fed, 17(70.8%) were found to have sepsis. Odd Ratio was 0.56 (95% CI=0.22 to 1.40) and p-value equal to 0.212 rendering the result as non-significant.

CONCLUSION: Though no significant association is found between feeding pattern and late neonatal sepsis, It is therefore concluded that bottle feeding is a major contributor in the causation of late onset neonatal sepsis.

KEY WORDS: Neonate, sepsis, breast feeding, bottle feeding.

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INTRODUCTION

Of the 130 million babies born every year, 4 million babies die in the first four weeks of life — the neonatal period[1], more than 10,000 deaths a day[2]. Most of these deaths remain unrecorded and invisible to all but the families who are aggrieved rather than to celebrate the new comer[3] .99 percent of these deaths occur in low- and middle-income countries, with the largest number contributed by the South Asian region. In poor communities, these deaths are unrecorded, indicating the perceived inevitability of their deaths while 1% of neonatal deaths that occur in rich countries are the subject of confidential inquiries and public outcry if services are judged substandard[4,5]. Most trials of neonatal interventions focus on these few deaths in rich countries. The inverse care law, first described in the UK in the 1960s, remains valid: "The availability of good medical care tends to vary inversely with the need for it in the population served[5,6]. For newborn babies, this law could appropriately be renamed the inverse information and care law: the communities with the most neonatal deaths have the least information on these deaths and the least access to cost-effective interventions to prevent them[6,7].

The current global neonatal mortality rate (deaths in the first 28 days of life per 1000 live births) is estimated to be 31 per 1000 live births[7,8]. In developing countries, neonatal mortality from all causes is about 34[8]; In contrast, neonatal mortality for developed countries is about 5. Neonatal mortality in Asia is about 34, in Africa about 42, and in Latin America and the Caribbean about 17,[8,9,10] but still, there are wide variations between different countries in these regions as well as within the countries themselves. It is generally assumed that neonatal mortality in developing countries is under-reported by at least 20%[11]. Indeed with neonatal mortality rates as high as over 40 per 1000 live births[12], India, Pakistan and Bangladesh together contribute to one third of global neonatal mortality. In Pakistan alone, this figure is 55 per 1000 live births[13,14].

MATERIAL & METHODS

This cross-sectional study was carried out in the Neonatology unit

of Pediatric Department, Khyber Teaching Hospital, Peshawar, Pakistan receiving patients from both out patient department and emergency. The study was completed in a period of six months,from April 8, 2009 to Oct 7, 2009. Using WHO sample size calculator, at 95%, 246 cases of full term infants with suspected late neonatal sepsis were selected through non probability purposive sampling. Full term infants, 7-28 days of age, born with uneventful spontaneous vaginal delivery at home or hospital or through caesarian section at hospital, bottle fed or breast fed, presenting with signs and symptoms highly suggestive of sepsis which may or may not be confirmed bacteriologically, were included. Premature and low birth weight infants, full term infants admitted in the hospital for any reason in the first week of life and cared once or more by the hospital staff, Infants with inborn metabolic problems or congenital heart disease were excluded. All full term infants, of any gender, meeting the inclusion criteria, brought to the neonatology unit, from any source (opd, emergency or clinic) were enrolled after the parent's or caregiver's informed/written consent and discussing with them verbally the purpose of the study. Ethical Review Board of Khyber Teaching Hospital granted approval. After the patients were stabilized hemodynamically, before administering antibiotics,in order to confirm late neonatal sepsis, cultures from blood, urine, CSF and umbilicus in all cases and pleural fluid in selective cases were taken with aseptic technique. After sending these specimens to the hospital laboratory, the infants were put on antibiotics as per unit's protocol which was continued or changed depending on the culture reports. Feeding pattern of the infant was determined. All this information was recorded on a pre prepared proforma. The data was analyzed on a computer using SPSS version 14. Descriptive statistics i.e. means and standard deviation, were calculated for continuous variables like age. Frequency and percentages were calculated for categorical variables like sex and feeding patterns. Odds ratios with 95% Confidence Interval

were calculated while Chi square test was used to compare late neonatal sepsis in breast and bottle fed infants. P value < 0.05 was considered significant.

RESULTS

In the six months study period, a total of 246 neonates admitted for late neonatal sepsis in the neonatology unit were enrolled and evaluated for their feeding pattern, whether breastfed or bottle-fed. Of the study participants, 140 (57%) were males and106 (43%) females, while 222 (90%) were bottle fed and 24 (10%) were exclusively breast fed. Among bottle fed 128 (57.6%) were confirmed as having neonatal sepsis while in breast fed, 17 (70.8%) were found to have sepsis Descriptive and inferential statistics are shown in Table 1.

No significant difference was

found in the feeding pattern and late neonatal sepsis both as a result of Chi-sq and O.R.

DISCUSSION

This study indicates that protection against neonatal sepsis is given even with partial breast feeding among neonates in a poor community with a high mortality from neonatal sepsis. In these severely ill infants the diagnosis was usually obvious and there were few differential diagnoses. This was especially true because no case of early neonatal sepsis, which can be difficult to diagnose, was seen in this study. It is possible that early cases of neonatal sepsis died at home before they had time to reach hospital. Possibly exclusive breast feeding would provide even better protection[14,15].

Several reviews published during the 1980s 15 questioned whether breastfeeding is causally associated

TABLE 1: STATISTICAL MEASURES

Feeding Pattern	Late Neonatal Sepsis Confirmed		Total
	Yes	No	
Bottle Fed	128	94	222
Breast Fed	17	7	24
Total	145	101	246
O.R	0.56		
95% CI	0.22 to 1.40		
p-value	0.212		
Mean age (days)	16.75 ±5.93 SD		

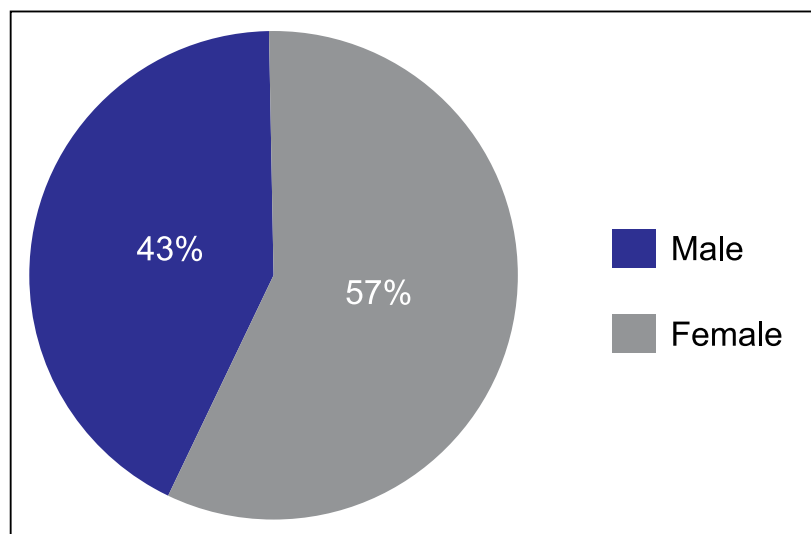O.R=Odd Ratios , CI=Confidence Interval
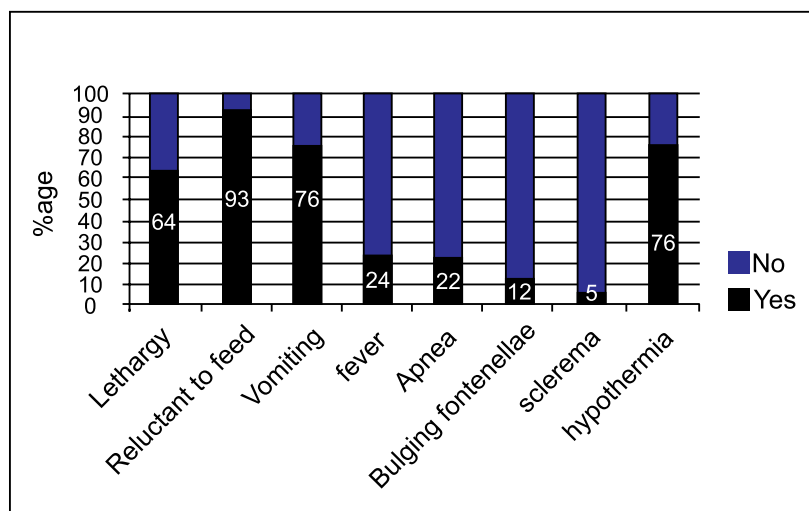

Fig 1: Gender wise distribution of Neonates (n=246)

Fig 2: Clinical Features of Neonates (n=246)

with lower rates of illness[16], particularly in the industrialized world. Earlier studies were faulted for problems associated with recall bias, surveillance bias[16,17,18,19], detection bias[19,20], lack of adjustment for confounding, and the fact that illness may precipitate formula use, thus accounting for the association. This study collected data that was recorded cross sectionally in the medical record[21], and incidence of illness as well as feeding practice was assessed along with hospitalization[22,23], thereby avoiding both recall problems and surveillance bias. Because it is ethically impossible to randomly assign infants to feeding groups[24], this study provides the strongest experimental evidence[25,26], which suggests that increases in breastfeeding are causally associated with declines in infant morbidity[27]. Although occasional studies[11,27] find no significant protective effect of breastfeeding on infant illness, the bulk of evidence should be considered with reference to causation[28], because many factors may undermine the ability to demonstrate a particular criterion in a particular situation. This body of evidence strongly supports the hypothesis that formula feeding increases the risk of infectious illness in infancy[29,30].

CONCLUSION

Though this study could not establish a significant association between patterns of feeding i.e. exclusively breast fed and bottle fed, however the fact that promotion of breast feeding, at the community level can decline the incidence of gastrointestinal and respiratory illness. Literature review suggests that increasing rates of breastfeeding, particularly among high-risk groups and in settings with low rates of breastfeeding, is an effective means of reducing infant illness at the community level.

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