Salmonella Senftenberg Septicemia: A Nursery Outbreak

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Salmonella infections in the newborn carry special significance as they are associated with higher attack rate, morbidity and mortality. The occurence of septicemia has been reported in 5% cases of all *Salmonella* infections(1). *S. typhimurium* is commonest causative agent of nursery outbreaks amongst the non-typhoidal salmonella serotypes, the others being *S. anatum, S. newport, S. oranienberg, S. Weltervreden, S. barielly* and *S. alachua*(2).

Salmonella senftenberg is a rare serotype of salmonella and was first isolated from India in 1970(3). Since then only five cases of neonatal septicemia due to this organism have been reported(4-7). This communication describes the clinical features and the outcome of five more cases of neonatal septicemia caused by *S. senftenberg*. Interestingly, none of these had diarrhea.

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Material and Methods

The present study is based on five neonates having *S. senftenberg* septicemia admitted to the special care baby unit of GTB Hospital. Since all the cases occurred within a short time span of 40 days, a common source of infection was suspected. A detailed microbiological examination of the nursery environment was carried out. Stool cultures of all the newborns, mothers and staff in the nursery were obtained. A complete sepsis screen was done on all symptomatic newborns. Infected babies were isolated. Following this epidemic, the nursery was temporarily closed and fumigation done to curb the infection.

Results

The clinical features are depicted in the *Table.* All babies were delivered normally and sustained mild to moderate asphyxia. Bottle/tube feeding with expressed breast milk was commenced as soon as their condition stabilized. The symptoms appeared towards the end of the first week. The complications encountered included shock, meningitis and prolonged apneic spells (one case each). The organism was uniformly sensitive to cefotaxime, gentamicin, chloramphenicol and resistant to ampicillin and kanamycin. The babies responded satisfactorily to a combination of cefotaxime (75 mg/kg/day) and gentamicin (5 mg/kg/day) administered IV for a period of 14 days. However, the baby with meningitis died within 72 hours of starting therapy. After discharge, follow-up cultures of stool in the four surviving newborns remained negative. The source of infection could not be traced. Outbreak was nipped only after the nursery was shut down and thoroughly fumigated.

TABLE–*Clinical Picture of the Newborns with Salmonella senftenberg Isolates*

S. No.	Sex	Gestational age (weeks)	Birth weight (kg)	Apgar score (1.5 min)	Sign, symptoms, complications	Day of onset	Salmonella isolated from	Outcome
1.	M	33	1.50	3,6	Sluggishness, Poor cry, abdominal distension, pallor, axillary pustules	8	Blood pus	Improved
					Shock	10		
2.	F	32	1.35	6,7	Prefeed aspirates, hypothermia, vomiting	5	Blood	Died
					Convulsions	7		
3.	F	38	2.30	4,8	Prefeed aspirates, fever	6	Blood	Improved
4.	M	32	1.50	3,7	Not gaining weight pallor, vomiting, sluggishness, poor cry	11	Blood	Improved
					Apneic spells	12		
5*	F	34	1.60	Not known	Prefeed aspirates	6	Blood rectal swab	Improved

*Detected on survey.

Discussion

S. senftenberg was first isolated in our nursery from blood, pus and stool of a single neonate 6 months prior to the present outbreak(7). Occurrence of the present outbreak suggests that the organism is difficult to eradicate completely. Chaturvedi *et al.*(4) also noticed occurrence of 2 sporadic fatal cases, 4 and 9 months, after apparent control of the outbreak. Due to its ability to resist high temperature, *S. senftenberg* has survived in pork-pies and caused a large outbreak in Middlands which included special care baby unit as well(8)

The clinical picture was non-specific and merely suggested neonatal sepsis. It is difficult to draw comparison between cases of septicemia caused by *S. senftenberg* reported earlier and our study because of paucity of data. Of the 46 isolations of *S. senftenberg* reported till date from newborns, majority (n=37) were recovered from stool. In only 4 cases each, the organism has been isolated separately from blood and CSF. Pus culture was positive in only 3 of the affected newborns(4-7). Diarrhea, the commonest presenting feature in these cases, was conspicuously absent in our cases. The decreased resistance of

hosts due to prematurity, low birth weight and birth asphyxia probably contributed to the systemic spread rather than the colonization of the GI tract. Out of five cases of *S. senftenberg septicemia* reported prior to this study, four survived. However, 4 other newborns where the organism could be isolated from CSF alone, died. In the present study, one child who developed meningitis died within 72 hours of starting therapy. Since a high incidence of complications such as shock, apneic spell and meningitis were observed in the present series, an aggressive approach towards the management of *S. senftenberg* sepsis is warranted.

Follow-up of neonates who had suffered from salmonellosis is necessary as it has been shown that smaller and younger neonates are likely to excrete organism for a longer time and antibiotic therapy tends to increase the duration of carrier state(9). Such carriers maintain infection in the community and may act as source for starting fresh epidemics.

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Citrobacter Septicemia in Neonates

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A major cause of neonatal mortality in India is bacterial sepsis(1). Neonatal infections acquired in the hospital are noso-

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