

# Mothers' Knowledge Regarding Danger Signs of Newborn

Sangeeta Bhandari<sup>1</sup>, Manju Vatsa<sup>2</sup>, AK Deorari<sup>3</sup>, Sanjeev Kumar Gupta<sup>4</sup>, Kamlesh Kumari Sharma<sup>5</sup>

## Abstract

*This descriptive cross-sectional study was undertaken to assess the knowledge of mothers in urban and rural areas about new born danger signs. It included 200 mothers of infants (100 from urban and 100 from rural area), from the Paediatrics OPD and Paediatrics and Maternity Wards, of All India Institute of Medical Sciences (AIIMS), New Delhi, and the Comprehensive Rural Health Services Project (CRHSP), Ballabgarh. The data was collected using self-developed and semi structured interview schedule. The mean knowledge score of mothers regarding newborn danger signs was 39.3 percent. The urban mothers had a mean score of 44.7 percent (graded as 'average') as compared to rural mothers whose mean knowledge score was 32.94 percent (graded as 'poor'). The urban mothers had significantly better knowledge as compared to rural mothers regarding newborn danger signs. Majority of mothers could state at least one symptom of hyperthermia 191 (95.5%), severe jaundice 162 (81%), lethargy 150 (75%), respiratory distress 127 (63.5%), and hypothermia 103 (51.5%). Majority of mothers responded that if danger signs are observed in newborns then immediate medical consultation would be necessary. In rural area majority of mothers did not identify hypothermia (64%), convulsions (85%), skin pustules (65%), respiratory distress (54%) and severe dehydration (85%) as danger sign in newborns. The study showed that mothers had inadequate knowledge regarding newborn danger signs and their management. Educational interventions for mothers are needed to make them aware of the newborn danger signs and the need to seek care by qualified health providers for treatment.*

Every year more than 10 million children die in developing countries before they reach their fifth birthday (IMNCI, 2003). Mortality among sick neonates is very high; facilities for appropriate care of very sick neonates are limited, and concentrated in urban areas. It is therefore important that they are identified early, and referred for appropriate treatment. Little is known about traditional household practices in the intra-partum and postnatal periods, illness recognition, and the sociocultural and logistic factors that affect care-seeking by families for their newborn infants (UNICEF, 2009).

Mothers, specially first-time mothers, are often not involved in taking critical decisions. Decision to seek care outside home almost always involves the father of the child or another male member. Primary care providers (qualified or unqualified) are often not sufficiently skilled to deal with the newborns. There is a gap between mothers' knowledge and their health-seeking behaviour for sick newborn

(Willis et al, 2009). The care-seeking behaviour among the mothers underlines an urgent need to generate awareness among them, so that they are able to recognise the danger signs in the newborns. Early identification of any danger signs of illness can ensure that mothers approach the health facility in time. It is equally important that the mothers approach qualified health providers for treatment (Othero et al, 2008).

Three major groups of factors that alone or in combination, appeared to contribute to most deaths were, delays in seeking medical care on behalf of the parents, medical interventions reported as ineffective by mothers and delays in providing medical care to children who arrived at the hospital too late in the day to be scheduled for consultation (Shakil, 2009). Early identification of danger signs in the newborn helps to seek proper medical attention and further prevent deterioration in the condition of the baby. For the early identification of these danger signs, mothers must have knowledge regarding the newborn danger signs and their management.

Thus, it is important that mothers, caregivers and health workers are able to recognise the signs and symptoms which indicate that the

*The authors are : 1. MSN, 2. Principal both at College of Nursing, AIIMS, New Delhi; 3. Professor - Division of Neonatology, 4. Professor - Centre for Community Medicine and 5. Lecturer, at College of Nursing, AIIMS, New Delhi.*

newborn is not well. Early recognition of danger signs will help in identifying those newborns who need urgent care and treatment. Globally, some studies have been conducted related to perception and care seeking practices of mothers of infants / children using different methodologies. However, in India, few studies have reported knowledge of mothers about newborn danger signs. The danger signs in this study are defined as the conditions and circumstances that are superimposed on the normal course of events which can be a threat to the lives of the newborns, as specified in Essential Newborn Care (ENBC) /IMNCI module of Government of India. Knowledge is defined as information and awareness of mothers regarding newborn danger signs and their management, as assessed by semi structured interview schedule.

The objective of this study was to assess the knowledge of mothers in rural and urban areas about newborn danger signs.

### Materials and Methods

This descriptive cross-sectional study was conducted in the paediatrics OPD and paediatrics and maternity wards, of the All India Institute of Medical Sciences (AIIMS), New Delhi, and the Comprehensive Rural Health Services Project (CRHSP), Ballabgarh. The CRHSP, Ballabgarh is located in District Faridabad, Haryana, at a distance of about 40 km from the AIIMS. Through a network of two primary health centres (PHCs), and twelve sub-centres, it provides comprehensive health care services to a population of 86,000 spread across 28 villages. A 50-bedded hospital at Ballabgarh provides secondary level care, including conduct of deliveries. The participants were mothers of infants, who could understand Hindi or English. Data collection was undertaken from June 2010 to November 2010.

The study was approved by the Ethics Committee of the AIIMS. Written informed consent was taken from the participants.

For estimation of sample size, it was assumed that 50 percent of respondents would recognise a danger sign. With an absolute precision of 7 percent, and 95 percent confidence intervals, the sample size was estimated to be 200. It was proposed to include 100 participants from the AIIMS, and 100 from CRHSP, Ballabgarh. Convenience sampling was undertaken. The first 100 consecutive mothers at the AIIMS who resided in urban area, and first 100 consecutive mothers at CRHSP,

Ballabgarh hospital who resided in rural area, were recruited to the study.

Information was collected with the use of a semi-structured interview schedule, administered in Hindi or English, by a single investigator. It was designed in English and translated into Hindi, and then back-translated into English to ensure correctness of translation. It was then pre-tested and necessary modifications were made. The duration of each interview was 20-30 minutes.

The schedule comprised of three parts. The first part contained 25 items pertaining to different symptoms and the action to be taken for the same; the maximum possible score was 25. The second part contained 13 true or false type questions on symptoms and action to be taken; the maximum possible score was 13. The third part contained items pertaining to symptoms of eight newborn danger signs and the action to be taken; the maximum possible score was 47, where the maximum score for each danger signs and symptoms and action was 6 to 8. The eight newborn danger signs were hypothermia, hyperthermia, convulsions, lethargy, more than ten skin pustules, severe jaundice, breathing problems and severe dehydration. The combined maximum possible score of the three parts was 85.

To categorise scores, the total score of each mother was converted to a percentage. The scores were then categorised as:

|         |   |                     |
|---------|---|---------------------|
| > 80%   | = | Outstanding         |
| 60%-80% | = | Good knowledge      |
| 40%-60% | = | Average knowledge   |
| 20%-40% | = | Poor knowledge      |
| < 20%   | = | Very poor knowledge |

Data analysis was done using SPSS 15.0 package. A p-value of < 0.05 was taken as significant, and 95 percent confidence intervals were estimated. Demographic data were compared with chi square, t test and Mann Whitney test.

### Results

The mean age of the urban mothers was 26±4.4 years, whereas in rural mothers, the mean age was 24.26±3.8. The mean family income of urban mothers was Rs. 13775±6769, and in rural area, the mean family income was Rs. 6762±3284. Both in urban as well as rural areas, the majority of mothers were educated upto secondary level, 73 percent in urban and 78 percent in rural area. Most of mothers in both areas had more than one child, i.e., 69% in

Table 1: Demographic characteristics of the subjects

| Demographic Characteristics |                       | Urban (n=100)<br>Number | Rural (n=100)<br>Number | p-value<br>Chi- square |
|-----------------------------|-----------------------|-------------------------|-------------------------|------------------------|
| Educational status          | Illiterate            | 1                       | 20                      | 0.0001                 |
|                             | Upto secondary school | 73                      | 78                      |                        |
|                             | Graduation and above  | 26                      | 2                       |                        |
| Occupation                  | Housewife             | 98                      | 100                     | 0.249                  |
|                             | Employed              | 2                       | 0                       |                        |
| Type of house               | Kachha                | 7                       | 20                      | 0.012                  |
|                             | Pakka                 | 93                      | 80                      |                        |
| Religion                    | Hindu                 | 84                      | 91                      | 0.026                  |
|                             | Muslim                | 9                       | 9                       |                        |
|                             | Christians            | 7                       | 0                       |                        |
| No. of children             | One child             | 31                      | 32                      | 0.879                  |
|                             | More than one child   | 69                      | 68                      |                        |

urban, and 68 percent in rural area. Majority of mothers were from joint family, 52 percent in urban and 60 percent rural area (Table 1).

The mean knowledge of mothers regarding newborn danger signs was  $33.4 \pm 8.6$ . In urban mothers, the mean knowledge score was  $38 \pm 7.8$ ; in rural mothers it was  $28 \pm 6.7$ . Converting this mean score to a percentage, the mean knowledge of mothers regarding newborn danger signs was 39.3 percent, which is 'poor'. The corresponding figures for urban and rural mothers were 44.7 percent, which is 'average', and 32.9 percent, which is 'poor'.

Of the total 200 mothers, 1 percent had 'good' knowledge, 25 percent had 'average', 70.5 percent had 'poor', and 3.5 percent had 'very poor' knowl-

edge. In the urban area, 53 percent mothers had 'poor' knowledge regarding newborn danger signs, 45 percent had 'average' knowledge, and 2 percent had 'good' knowledge. In the rural area, 88 percent mothers had 'poor' knowledge, 5 percent had 'average', and 7 percent had very poor knowledge (Fig. 1). Forty percent (n=80) of the 200 mothers could state at least one danger sign in newborn; the figure was 52 percent in urban mothers, and 28 percent in rural mothers (Fig. 2).

The mean knowledge of urban mothers was significantly higher ( $p < 0.0001$ ) than the rural mothers regarding newborn danger signs. The urban mothers had significantly higher knowledge regarding hypothermia ( $p = 0.0001$ ), hyperthermia ( $p = 0.001$ ), convulsions ( $p = 0.0001$ ), lethargy ( $p = 0.0001$ ), severe jaundice ( $p = 0.003$ ), respiratory distress ( $p = 0.0001$ ), severe dehydration ( $p = 0.0001$ ) as compared to rural mothers (Table 2).

Among urban mothers, 53 percent had 'very poor' knowledge regarding convulsions, and 52 percent regarding severe dehydration. Sixty percent of them had 'average' knowledge regarding lethargy and severe jaundice, and 52 percent regarding respiratory distress. Among rural mothers, a large majority had 'very poor' knowledge regarding hypothermia (75%), convulsions (81%), severe dehydration (77%) and skin pustules (57%). They had 'poor' knowledge regarding hyperthermia (63%). The rural mothers had average knowledge regarding lethargy (44%), and 'good' knowledge regarding respiratory distress (44%).

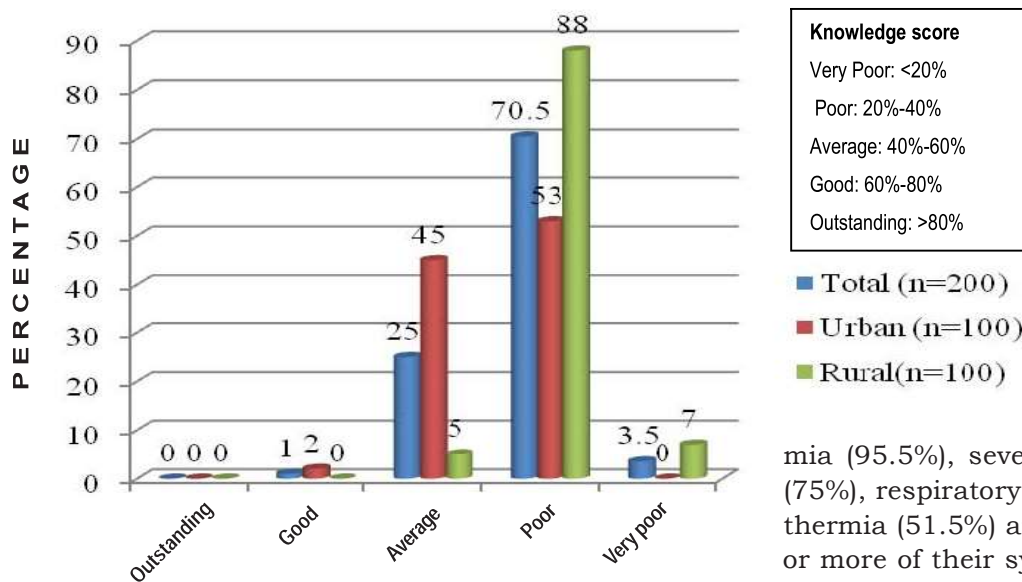
Significant positive correlation was seen between age of the mother and knowledge about newborn danger signs, i.e., older mothers had better knowledge regarding newborn danger signs than younger mothers ( $p = 0.046$ ). There was a positive correlation between family income and knowledge of mothers regarding newborn danger signs ( $p < 0.0001$ ). The knowledge score was significantly associated with education of the mother ( $p < 0.0001$ ). The mothers upto secondary education had significantly higher knowledge compared to illiterate ( $p < 0.0001$ ). Also, the mothers with higher education, i.e. graduation and above, had better knowledge of

Table 2: Comparing the knowledge about newborn danger signs among urban and rural mothers.

| Danger signs          | Urban (n= 100) |                           | Rural (n= 100) |                           | p value @      |
|-----------------------|----------------|---------------------------|----------------|---------------------------|----------------|
|                       | Mean $\pm$ SD  | Mean % of knowledge score | Mean $\pm$ SD  | Mean % of knowledge score |                |
| Total knowledge score | $38 \pm 7.8$   | 44.7                      | $28 \pm 6.7$   | 32.9                      | $< 0.001^{**}$ |
| Hypothermia           | $1.7 \pm 1.3$  | 34.8                      | $0.9 \pm 1.1$  | 17.4                      | $0.0001^{***}$ |
| Hyperthermia          | $3.3 \pm 1.2$  | 47.4                      | $2.8 \pm 1.0$  | 39.4                      | $0.001^{**}$   |
| Convulsions           | $2.8 \pm 2.1$  | 39.9                      | $0.8 \pm 1.3$  | 12.1                      | $0.0001^{***}$ |
| Lethargy              | $4.2 \pm 1.5$  | 52.4                      | $3.1 \pm 1.7$  | 39.1                      | $0.0001^{***}$ |
| Skin pustules         | $2.1 \pm 1.3$  | 35.2                      | $1.8 \pm 1.2$  | 30.2                      | 0.1            |
| Severe jaundice       | $4.7 \pm 1.4$  | 46.9                      | $4.0 \pm 1.8$  | 39.9                      | $0.003^{**}$   |
| Respiratory distress  | $8.1 \pm 2.0$  | 58.1                      | $6.3 \pm 2.1$  | 45.2                      | $0.0001^{***}$ |
| Severe dehydration    | $2.7 \pm 1.8$  | 26.8                      | $1.5 \pm 1.2$  | 15.2                      | $0.0001^{***}$ |

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$ , @Independent t test

**Fig. 1 : Knowledge score of mothers regarding newborn danger signs**



danger signs in newborn than their less educated or illiterate counterparts ( $p < 0.0001$ ).

There was no significant association between knowledge score regarding newborn danger signs and type of the family ( $p = 0.64$ ), and number of children ( $p = 0.35$ ).

### Discussion

In the present study, the mean knowledge score of mothers regarding newborn danger signs was 39.3 percent (44.7% among urban and 32.9% in rural mothers). Majority of participants in both groups had 'poor knowledge' about newborn danger signs; however, urban mothers had better knowledge as compared to rural mothers. Mothers who were older,

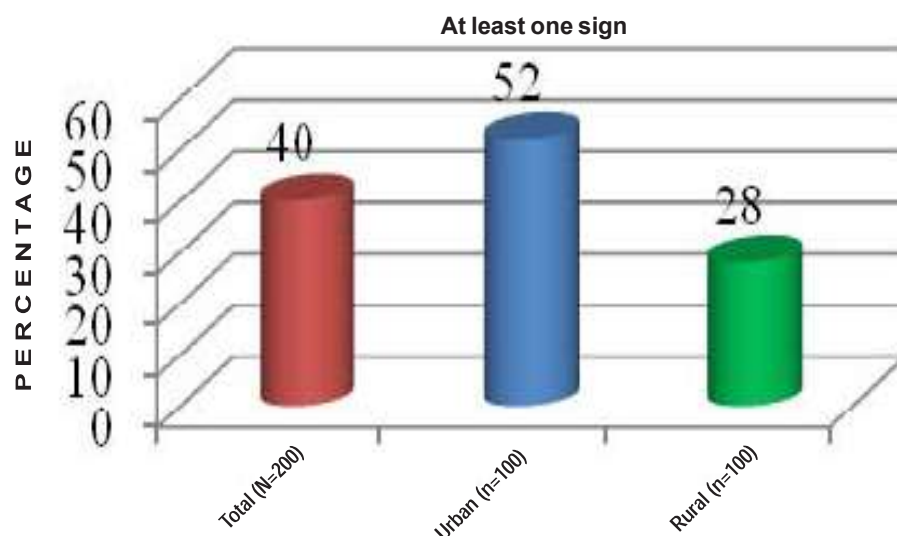
or had better education, had better knowledge.

In the present study, at least one danger sign was known to 40 percent mothers. Dongre et al (2008) have reported that about 67.2 percent mothers knew at least one danger sign. Majority of mothers could state major danger signs in newborns within 28 days of delivery, i.e. hyperthermia (95.5%), severe jaundice (81%), lethargy (75%), respiratory distress (63.5%), and hypothermia (51.5%) and they could also state one or more of their symptoms. Syed et al (2008) and Athumani (2008) also reported similar findings.

In rural area in the present study, the majority of mothers did not perceive hypothermia (64%), convulsions (85%), skin pustules (65%), respiratory distress (54%) and severe dehydration (85%) as a danger signs in newborns. Willis et al (2009) also showed that perception of illness was significantly lower. Bazzano et al (2008) also reported a significant delay in care seeking for ill newborns. In rural area, only 15 percent mothers could state convulsions as a danger sign. Kaushal M et al (2005) also reported that only 10 percent mothers could describe the abnormal movements in neonates.

In the present study, most of the rural mothers who could state the danger signs and their symptoms, would like to seek immediate medical attention. For hyperthermia 81.2% (78/96), convulsion 93.3% (14/15), lethargy 88.2% (60/68), skin pustules 82.8% (29/35), severe jaundice 96% (72/75), respiratory distress 93.5% (43/45), and severe dehydration 80% (12/15) of those who stated the respective sign as a danger sign, would like to take immediate medical consultation for their babies. Kaushal M et al reported that, though the knowledge regarding sickness in neonates was present, health care seeking from the qualified person was delayed with most mothers

**Fig. 2 : Percentage of mothers who could state at least one danger sign in newborn**





preferring village practitioners (27%) to government hospital (6%).

Few studies from India have reported knowledge of mothers regarding danger signs among the newborn. This study provides useful information in this regard. The limitation of the present study is that it was conducted in the hospital setting, both in urban as well as in rural area. Further, the mothers may not have experienced about all the signs and symptoms of danger signs seen in newborns; no audio-visual aid was used to ask the mothers about danger signs seen in newborns. As some of the mothers were selected from the ward, their knowledge might be influenced by the educational information provided by the health care providers during their present hospital stay.

In conclusion, the overall knowledge of mothers regarding newborn danger signs was 'poor'. Majority of participants in both urban and rural groups had 'poor' knowledge about newborn danger signs; however, urban mothers had better knowledge as compared to rural mothers.

Community-based educational interventions are essential to improve the knowledge of care-givers regarding danger signs among the neonates. These should not only target mothers, but decision-makers in the families as well, if the recognition of the danger sign by the mother is to be followed by appropriate action for treatment. Such interventions are likely to pay rich dividends in terms of improved child survival. Studies on educational intervention and its effect on knowledge of the mothers as well as the other family members including father and grandmothers regarding recognition and management of newborn danger signs need to be undertaken.

## References

1. Students' Handbook for IMNCI (Integrated Management of Neonatal and Childhood Illness). World Health Organization, Ministry of Health & Family Welfare. Government of India, 2003
2. UNICEF. The State of the World Children 2009: Child Survival. New York: UNICEF, 2009. Available from: <http://www.unicef.org/sowc09/docs/SOWC09-FullReport-EN.pdf>. Accessed 7 January 2011.
3. Willis JR, Kumar V, Mohanty S, Singh P, Singh V, Baqui AH, et al. Gender differences in perception and care-seeking for illness of newborns in rural Uttar Pradesh, India. *J Health Popul Nutr*. 2009 Feb; 27(1): 62-71.
4. Othero DM, Orago AS, Groenewegen T, Kaseje DO, Otengah PA. Home management of diarrhea among underfives in a ru-

ral community in Kenya: Household perceptions and practices [Internet]. *East Afr J Public Health*, 2008 Dec; 5(3): 142-6. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/19374313>. Accessed 27 December 2010.

5. Shakil M. Infant mortality rate highest in India: Report. CNN-IBN 2009 Oct 5 Available from: <http://ibnlive.in.com/news/infant-mortality-rate-highest-in-india-report/102751-3.html>. Accessed 25 November 2010
6. Dongre AR, Deshmukh PR, Garg BS. Perceptions and health care seeking about newborn danger signs among mothers in rural Wardha. *Indian J Pediatr*, 2008 Apr; 75(4): 325-29
7. Syed U, Khadka N, Khan A, Wall S. Care-seeking practices in South Asia: Using formative research to design program interventions to save newborn lives. *J Perinatol*, 2008 Dec; 28 Suppl 2: S9-13
8. Athumani J. Knowledge, attitudes and practices of mothers on symptoms and signs of Integrated Management of Childhood Illnesses (IMCI) strategy at Buguruni Reproductive and Child Health clinics in Dar es Salaam. *Dar Es Salaam Medical Students' Journal*, 2008; Vol 15, No 1
9. Bazzano AN, Kirkwood BR, Tawiah-Agyemang C, Owusu-Agyei S, Adongo PB. Beyond symptom recognition: care-seeking for ill newborns in rural Ghana. *Trop Med Int Health*, 2008 Jan; 13(1): 123-28
10. Kaushal M, Aggarwal R, Singal A, Shukla H, Kapoor SK, Paul VK. Breastfeeding practices and health-seeking behavior for neonatal sickness in a rural community. *J Trop Pediatr*, 2005 Dec; 51(6): 366-76; Epub 2005 May 31

## Aggarwal College of Nursing & Hospital

Tehsil Road, Guruharsahai, Distt. Ferozepur (Pb)

(Approved by Govt. of Punjab, INC Delhi and  
PNRC Chandigarh & Affiliated to B.F.U.H.S, Faridkot)

### FACULTY REQUIRED

#### 1. Principal

MSc (N) with experience as per INC ruling

#### 2. Lecturers

MSc (N) (Psychiatry and CHN) with experience as per INC ruling.

#### 3. Clinical Instructors :

BSc (Nursing)

Excellent salary assured.

Contact immediately :

Ph: 01685-231156, 231356; M: 9814916559

Fax: 01685-231956

**Dr. Pawan Aggarwal, MD**  
Director