**Scholars Journal of Applied Medical Sciences (SJAMS)**
***Abbreviated Key Title: Sch. J. App. Med. Sci.***
**ISSN 2320-6691 (Online)**
**ISSN 2347-954X (Print)**

A Unit of Scholars Academic and Scientific Society, India
www.saspublishers.com

Pediatrics

# Knowledge of First Contact Health Care Personnel Regarding Identification of Newborn Danger Signs and Facilitated Referral: A Study from Andhra Pradesh, South India

**Dr. A. Satyavani[1], Dr. M. Srinivasa Reddy[2*], Dr. D. Manikyamba[3]**
[1]Assistant Professor, Department of Pediatrics, Government General Hospital, Rangaraya Medical College, Kakinada, Andhra Pradesh, India
[2] Senior Resident in Neonatology, Department of Pediatrics, Government General Hospital, Rangaraya Medical College, Kakinada, India
[3]Professor and Head, Department of Pediatrics, Government General Hospital, Rangaraya Medical College, Kakinada India

**Original Research Article**

***Corresponding author**
*Dr. M. Srinivasa Reddy*

**Article History**
*Received: 22.12.2017*
*Accepted: 27.12.2017*
*Published: 30.12.2017*

**DOI:**
10.36347/sjams.2017.v05i12.060

**Abstract:** Although studies on knowledge of mothers on identification of dangers signs are present, very limited studies are available on knowledge of ASHAs and ANMs, who are actually the first contact healthcare personnel of newborn care. Aim is to assess the knowledge of first contact health care personnel on newborn danger signs, pre-referral treatment /stabilization and care during transport of sick neonates to higher health care facility. This cross sectional observational study focuses on knowledge of ASHAs and ANMs from PHC Vetalapalem and CHC Peddapudi which come under the catchment area of Government General Hospital, Kakinada. A pre-designed 3-part questionnaire in local language is used to assess the knowledge of health care personnel on when to refer (ability to identify IMNCI danger signs), how to refer and what pre-referral stabilization and treatment given. Most commonly cited danger signs unprompted by ASHAs were respiratory distress (57.5%), jaundice (46.6%), and refusal of feeds (46.6%), low birth weight (38.4%), fever (37%) and seizures (28.8%). Most commonly cited danger signs unprompted by ANMs were respiratory distress (76.6%), fever (55.8%), and refusal of feeds (50.6%), loose stools (42.8%) and rash/skin pustules (37.7%). Trained ANMs showed statistically higher rates of knowledge than untrained ANMs ($P < 0.05$). Only 13.7% of ASHAs and 15.6% of ANMs practice writing referral slip. Inclusion of ASHAs in newborn training programmes, conducting regular training programmes, carrying IMNCI danger sign checklist during each home visit, provision of newborn care facilities in 108 ambulance and training 108 staff on care of newborn during transport improves newborn care and reduces their mortality and morbidity.
**Keywords:** ASHA, ANM, Referral, Danger signs.

## INTRODUCTION

Neonates are prone to show subtle signs of illness. Listlessness and feeding difficulty are sometimes the only signs and illness may advance quickly [1, 2]. This lack of specificity in clinical manifestations of neonatal morbidity leads to difficulty in identification of danger signs and delay in seeking health care, thus increasing their mortality. Transport of sick newborns in India is still at a premature stage. Majority of newborns referred to tertiary care hospitals from peripheries were found to be critically sick at the time of arrival due to delayed referral, lack of prereferral stabilization and lack of care during transport.

Although studies on knowledge of mothers on identification of dangers signs are present, very limited studies are available on knowledge of ASHAs and ANMs, who are actually the first contact healthcare personnel of newborn care. This study was conducted to assess the knowledge of ASHAs and ANMs on newborn danger signs and facilitated referral.

## MATERIALS AND METHODS

This cross sectional observational study was conducted to assess the knowledge of ASHAs and ANMs from PHC Vetalapalem and CHC Peddapudi which come under the catchment area of Government General Hospital, Kakinada. Ethical approval for this study has been obtained from the Institutional Ethics Committee of Rangaraya Medical College, Kakinada.

Prior permission was taken from concerned DMHO and DCHS for conducting the study. Consent was obtained from the participants at the time of study.

A pre-designed 3-part questionnaire in local language is used to assess the knowledge of health care personnel on when to refer (ability to identify IMNCI danger signs), how to refer and what pre-referral stabilization and treatment given. To evaluate the knowledge of health care personnel about newborn danger signs, they are asked to name 5 newborn danger signs they knew (unprompted). Later, they are given a list of symptoms from which they are asked to identify the IMNCI danger signs (prompted). The questionnaire used to evaluate their knowledge on facilitated referral is based on the Gilroy and Winch definition of facilitated referral [3,4], the components of which are:

- Promoting compliance with referral
- Monitoring of referral
- Addressing barriers to referral
- Providing initial treatment prior to referral.

After assessing knowledge of health workers, we utilized this opportunity to train ASHAs and ANMs on newborn danger signs and facilitated referral. All categorical variables were presented as frequencies and percentages. Chi square test was applied and p values were calculated for the comparison of knowledge between trained and untrained ANMs. The statistical analysis was carried out at 5% level of significance and p value <0.05 was considered significant. Confidence intervals were calculated for knowledge of danger signs. Data analysis was done by Microsoft Excel and SPSS (version 21) software.

## RESULTS

Out of total 150 participants, 73(48.7%) were ASHAs and 77(51.3%) were ANMs. 43 ASHAs and 44 ANMs belonged to Peddapudi CHC while 30 ASHAs and 33 ANMs belonged to Vetlapalem PHC. The mean age of ASHAs was 33.6 years and that of ANMs was 40.2 year. The mean duration of service in ASHAs and ANMs was 4.8 and 5.2 years respectively. Respiratory distress (57.5%) , jaundice and refusal of feeds (46.6% each) , low birth weight (38.4%), fever (37%) and seizures (28.8%) were the first five commonest dangers signs recalled by ASHAs unprompted .The first five commonest dangers signs recalled by ASHAs unprompted were respiratory distress (76.6%), fever (55.8%), refusal of feeds (50.6%), loose stools (42.8%) and rash/ skin pustules (37.7%) .

**Table-1: Knowledge on identification of danger signs prompted**

| DANGER SIGN* | ASHA | | | ANM | | |
|---|---|---|---|---|---|---|
| | N (73) | % | 95% CI | N (77) | % | 95% CI |
| Fast breathing | 61 | 83.6 | 75.11-92.09 | 65 | 84.4 | 76.3- 92.5 |
| Convulsions | 66 | 90.4 | 83.64-97.16 | 72 | 93.5 | 87.99-99.01 |
| Umbilical bleeding | 56 | 76.7 | 67-86.40 | 60 | 77.9 | 68.63-87.17 |
| Difficulty in breathing | 67 | 91.8 | 85.51-98.09 | 71 | 92.2 | 86.21-98.19 |
| Pus around umbilicus | 55 | 75.3 | 65.41-85.19 | 53 | 68.8 | 58.45-79.15 |
| Unconsciousness | 56 | 76.7 | 67-86.4 | 74 | 96.1 | 91.78- 100.42 |
| Skin rashes | 38 | 52.1 | 40.64- 63.56 | 55 | 71.4 | 61.31-81.49 |
| High body temperature | 45 | 61.6 | 50.44- 72.76 | 49 | 63.6 | 52.85-74.35 |
| Extreme weakness | 54 | 74.0 | 63.94- 84.06 | 58 | 75.3 | 65.67- 84.93 |
| Severe chest indrawing | 63 | 86.3 | 78.41-94.19 | 71 | 92.2 | 86.21-98.19 |
| Diarrhea | 56 | 76.7 | 67-86.4 | 54 | 70.1 | 59.87-80.33 |
| Excessive crying | 56 | 76.7 | 67-86.4 | 61 | 79.2 | 70.13-88.27 |
| Yellow skin/eyes | 67 | 91.8 | 85.51-98.09 | 66 | 85.7 | 77.88-93.52 |
| Very small baby | 61 | 83.6 | 75.11-92.09 | 60 | 77.9 | 68.63-87.17 |
| Redness of the baby | 37 | 50.7 | 39.23-62.17 | 38 | 49.3 | 38.13- 60.47 |
| Purulent eye discharge | 38 | 52.1 | 40.64-63.56 | 38 | 49.3 | 38.13- 60.47 |
| Low baby temperature | 49 | 67.1 | 56.32-77.88 | 55 | 71.4 | 61.31-81.49 |
| Inadequate/poor sucking | 33 | 45.2 | 33.78-56.62 | 44 | 57.1 | 46.05-68.15 |
| Umbilical discharge | 38 | 52.1 | 40.64-63.56 | 53 | 68.8 | 58.45-79.15 |
| Skin boils | 34 | 46.6 | 35.16- 58.04 | 38 | 49.3 | 38.13-60.47 |
| Abdominal distension | 45 | 61.6 | 50.44- 72.76 | 52 | 67.5 | 57.04-77.96 |
| Swollen eyes | 36 | 49.3 | 37.83-60.77 | 41 | 53.2 | 42.05-64.35 |
| Movement only stimulated | 53 | 72.6 | 62.37-82.83 | 70 | 91.0 | 84.61-97.39 |

* Multiple responses

Refusal of feeds (inadequate / poor sucking) even when prompted was identified as danger sign by only 45.2% of ASHAs and 57.1% of ANMS. Table 1 depicts the knowledge on danger signs of both ASHAs and ANMs when prompted. Written referral was written by only 13.7% of ASHAs and 15.6% of ANMs. 4.1 % of ASHAs and 5.2% of ANMs accompanied babies during transport. Advice regarding warmth care by

covering the babies with clothes in layers was given by 72.6% of ASHAs and 71.4% of ANMs. 68.5% of ASHAs and 57.1% of ANMs opined that financial problem is major barrier to referral. Knowledge of health workers on facilitated referral was depicted in table no 2.

**Table-2: Knowledge of health workers on facilitated referral**

| S.No | Referral Characteristic | ASHA N = 73 | ANM N = 77 |
|---|---|---|---|
| 1. | Referral provided | | |
| | Verbal | 63 (86.3) | 65 (84.4) |
| | Written | 10 (13.7) | 12 (15.6) |
| 2. | Mode of transport | | |
| | Government ambulance | 35 (47.9) | 35 (45.5) |
| | Private ambulance | 12 (16.4) | 3 (3.9) |
| | Auto | 23 (31.5) | 33 (42.8) |
| | Others | 3 (4.1) | 6 (7.8) |
| 3. | Accompanying persons | | |
| | Relatives | 8 (10.6) | 5 (6.5) |
| | Mother | 62 (84.9) | 68 (88.3) |
| | Myself (ANM & ASHA) | 3 (4.1) | 4 (5.2) |
| 4. | Care during transport | | |
| | A) Advice regarding warmth care | | |
| | KMC | 14 (19.2) | 15 (19.5) |
| | Covering with clothes in layers | 53 (72.6) | 55 (71.4) |
| | Demonstrate covering of baby | 3 (4.1) | 3 (3.9) |
| | No advice | 3 (4.1) | 4 (5.2) |
| | B) Advice regarding position of baby | | |
| | Avoid complete flexion of neck | 21 (28.8) | 43 (55.8) |
| | Slight extension of neck | 36 (49.3) | 26 (33.8) |
| | No advice | 16 (21.9) | 8 (10.4) |
| | C) Advice regarding feeding | | |
| | Breastfeeding | 55 (75.3) | 51 (66.2) |
| | Expressed breastmilk | 1 (1.4) | 13 (16.9) |
| | Formula feeds | 4 (5.5) | 7 (9.1) |
| | Nil per mouth | 59 (80.8) | 2 (2.6) |
| | No advice | 8 (11) | 4 (5.2) |
| | D) Barriers to referral | | |
| | Geographic | 8 (10.6) | 11 (14.3) |
| | Financial | 50 (68.5) | 44 (57.1) |
| | Non – availability of transport | 8 (10.6) | 4 (5.2) |
| | Non- acceptance of family members (due to belief in native medicine) | 1 (1.4) | 7 (9.1) |
| | Nobody to look after baby and mother separately , if baby is ill | 6 (8.2) | 11 ( 14.3) |
| 5. | Discharge of patient notified | | |
| | Yes | 69 (94.5) | 61 (79.2) |
| | No | 4 (5.5) | 16 (20.8) |
| 6. | Followup home visits | | |
| | Done | 61 (83.5) | 72 (93.5) |
| | Not done | 12 (16.5) | 5 (6.5) |

Trained ANMs showed increased awareness and knowledge than untrained ANMs in fields of written referral form, advice on KMC, demonstration of covering of baby and advice on breastfeed at referral, which was statistically significant ($p < 0.05$) table 3.

**Table-3: Comparison of knowledge between trained and untrained ANMs**

| S.No | Pre referral advice | Trained ANM N = 15 | Untrained ANM N = 62 | P value |
|---|---|---|---|---|
| 1. | Written referral | 10 | 2 | < 0.0001 |
| 2. | Advice on KMC | 8 | 7 | 0.0010 |
| 3. | Advice covering of baby in layers | 13 | 42 | 0.2076 |
| 4. | Demonstrate covering of baby | 3 | 0 | 0.0062 |
| 5. | Advice on breastfeeding | 15 | 36 | 0.0015 |

## DISCUSSION

Community Health Workers (CHW) plays a pivotal role in the health status of a rural population due to their close and continuous contact with the rural community. Moreover, due to shortage of adequate health facilities in rural India, CHWs have become a central figure in helping the community to identify and meet their health needs [5]. This study was conducted on 150 health workers about their knowledge on danger signs and facilitated referral. Out of them 48.7% were ASHAs and 51.3% were ANMs. None of the ASHAs and only 19.5 % of ANMs was trained in either NSSK or IMNCI. Majority of ASHAs (30.1%) and ANMs (36.4%) choose first referral centre as SNCU teaching hospital. 49.3% of ASHAs and 72.7 % of ANMs refer 1case/week. 97.3% of ASHAs and 100% of ANMs could write total 5 danger signs unprompted. The most commonly cited danger signs unprompted by ASHAs were respiratory distress (57.5%), jaundice (46.6%), and refusal of feeds (46.6%), low birth weight (38.4%), fever (37%) and seizures (28.8%). Most commonly cited danger signs unprompted by ANMs were respiratory distress (76.6%), fever (55.8%), and refusal of feeds (50.6%), loose stools (42.8%) and rash/skin pustules (37.7%).

When a list of newborn conditions were provided and asked to identify IMNCI danger signs (prompted), neither the ASHAs nor ANMs identified them all. Danger signs like abdominal distension, lethargy and hypothermia which were not cited when unprompted were identified when prompted. Although overall improvement is seen in knowledge of identifying danger signs when prompted, still there was alarming gap in identifying critical danger signs like refusal of feeds, hypothermia and lethargy. Refusal of feeds being the most important of all signs was identified by only 45.2% of ASHAs and 57.1% of ANMs. In study by Nalwadda CK *et al*. [6] at rural Kenya on community health workers (CHWs) , the most commonly mentioned newborn danger signs unprompted were red umbilicus/cord with pus (100%), newborn feeling hot or cold (83%), failure to breastfeed (77%) and convulsions (63%). None of the CHWs mentioned chest in-drawing and grunting as newborn danger signs. Almost all of the CHWs (56, 98%) correctly identified all the prompted newborn danger signs.

In present study, ASHA workers who are actually first contact health personnel do not have any training programmes while ANMs have NSSK and IMNCI training programmes. Only 19.5% ANMs in our participants were trained indicating the lapses in training programme. Agarwal PK *et al*. [7] study from rural India concluded the knowledge level of community health workers (CHW) is a crucial aspect of health systems affecting the coverage of community-based newborn health care programmes, as well as adherence to essential newborn care practices at household level.

Only 13.7% of ASHAs and 15.6% of ANMs wrote referral slip. 52% ASHA and 54.5% ANMs choose non-government mode of transportation for referral, the preferred mode among them is auto. Government services like 108 ambulances were underutilized. The reason being non- availability, denial from home referral unless 108 staff feels baby is critical and lack of response. Auto is preferred because it is easily available. In study by Sinha LN *et al.* [8] at Mewat, Haryana, delay in government ambulance was reported by 43% of ASHAs and they concluded that the responsiveness of government ambulance services to newborn emergencies needed improvement. Mother/parents were the accompanying persons during transport in home referrals. Only 4.1% of ASHAs and 5.2% ANMs accompanied during transport.

72.6% of ASHAS and 71.4% of ANMs adviced regarding warmth care by covering the baby in layers but only 4.1% of ASHAs and 3.9% of ANMs actually demonstrated how to cover the baby. 21.9% of ASHAs and 10.4% of ANMs do not give advice regarding position of baby during transport. 76.7% of ASHAs and 83.1% of ANMs adviced breastfeeding/EBM during transport. 68.5% of ASHAs and 57.1% of ANMs opined that financial problem is major barrier to referral. Except for advice on warmth care, no other pre-referral treatment/stabilization was done in both groups. Discharge of the patient was notified to 94.5% of ASHAs and 79.2% of ANMs. Follow up home visits were done by 83.5% of ASHAs and 93.5% of ANMs.

In the study by Namazzi G *et al.* [9], knowledge of CHWs on danger signs of newborns was low 20.8% (pretest), increased to 85.8% following training and decreased to 58.9% one year after training. In the present study, trained ANMs showed higher awareness and knowledge than untrained ANMs in fields of written referral form, advice on KMC,

demonstration of covering of baby and advice on breastfeeding during referral, which was statistically significant($P<0.05$). This emphasizes the need for regular training programmes with periodic reinforcement.

## CONCLUSION

In the present study, identification rate of danger signs when prompted is far better than unprompted. This highlights the need for IMNCI danger sign checklist to be carried by health workers during newborn home visits. There was alarming gap in identifying critical danger signs like refusal of feeds, hypothermia and lethargy, even when prompted. This necessitates the need for training programmes for health workers on newborn care. ASHA workers who are actually first contact health personnel are given a module on newborn care but not included in any training programmes while ANMs have NSSK and IMNCI training programmes. Only 19.5% ANMs were trained in the present study indicating the lapses in training programmes. This emphasizes the need for regular training programmes with periodic reinforcement.

Even though Government transport system 108 is available, majority opted for other modes of transport because of non-response/ delayed response by 108 staff especially for newborn home referrals. This shows the need to educate 108 staff on importance of transport of sick newborn. All 108 ambulances should be preferably equipped with a transport incubator and staff should be trained in care during transport.

Addressing and filling gaps of knowledge of health workers at ground level on newborn danger signs and facilitated referral, reduces the mortality and morbidity rates of extramural sick neonates admitted in tertiary care hospitals.

## REFERENCES

1. Bang AT, Bang RA, Reddy MH, Baitule SB, Deshmukh MD, Paul VK, Marshal TF. Simple clinical criteria to identify sepsis or pneumonia in neonates in the community needing treatment or referral. The Pediatric infectious disease journal. 2005 Apr 1;24(4):335-41.
2. Baqui AH, Rahman M, Zaman K, El Arifeen S, Chowdhury HR, Begum N, Bhattacharya G, Chotani RA, Yunus M, Santosham M, Black RE. A population-based study of hospital admission incidence rate and bacterial aetiology of acute lower respiratory infections in children aged less than five years in Bangladesh. Journal of health, population, and nutrition. 2007 Jun;25(2):179.
3. Winch PJ, Gilroy KE, Wolfheim C, Starbuck ES, Young MW, Walker LD, Black RE. Intervention models for the management of children with signs of pneumonia or malaria by community health workers. Health policy and planning. 2005 Jul 1; 20(4):199-212.
4. Gilroy KE, Winch PJ (2006). Management of sick children by community health workers: intervention models and programme examples. The United Nations Children's Fund (UNICEF)/ World Health Organization (WHO) 2006: 80 p.
5. World Health Organization (WHO) World Health Report 2000. Health systems: improving performance. Geneva: World Health Organization; 2000.
6. Kayemba Nalwadda C, Guwatudde D, Waiswa P, Kiguli J, Namazzi G, Namutumba S, Tomson G, Peterson S. Community health workers–a resource for identification and referral of sick newborns in rural Uganda. Tropical Medicine & International Health. 2013 Jul 1;18(7):898-906.
7. Agrawal PK, Agrawal S, Ahmed S, Darmstadt GL, Williams EK, Rosen HE, Kumar V, Kiran U, Ahuja RC, Srivastava VK, Santosham M. Effect of knowledge of community health workers on essential newborn health care: a study from rural India. Health policy and planning. 2011 Mar 8; 27(2):115-26.
8. Sinha LN, Kaur P, Gupta R, Dalpath S, Goyal V, Murhekar M. Newborn care practices and home-based postnatal newborn care programme – Mewat, Haryana, India, 2013. Western Pacific Surveillance and Response Journal : WPSAR. 2014;5(3):22-29.
9. Namazzi G, Okuga M, Tetui M, Kananura RM. Working with community health workers to improve maternal and newbornhealth outcomes: implementation and scale-up lessons from eastern Uganda. Global health action. 2017; 10, 1345495: 71-81.