



Assessment of Mother's Knowledge and Practices Regarding Adverse Events Following Immunization of Their Children in a Rural Area of Tripura

Anjan Datta¹, Subrata Baidya², Shampa Das³, Chanda Mog³, Srabani Datta⁴

Financial Support: None declared
Conflict of Interest: None declared
Copy Right: The Journal retains the copyrights of this article. However, reproduction of this article in the part or total in any form is permissible with due acknowledgement of the source.

How to cite this article:

Datta A, Baidya S, Das S, Mog C, Datta S. Assessment of Mother's Knowledge and Practices Regarding Adverse Events Following Immunization of Their Children in a Rural Area of Tripura. *Natl J Community Med* 2017; 8(4):159-163.

Author's Affiliation:

¹Asst Prof, Dept of Community Medicine, Tripura Medical College and Dr. BRAM Teaching Hospital, Agartala, Tripura; ²Asso Prof; ³Senior Resident, Dept of Community Medicine, Agartala Govt Medical College & GB Pant Hospital, Agartala; ⁴Asst Director, Monitoring & Evaluation, Tripura State AIDS Control Society, Agartala

Correspondence

Dr. Anjan Datta
dranjandatta86@gmail.com

Date of Submission: 27-03-17

Date of Acceptance: 29-04-17

Date of Publication: 30-04-17

ABSTRACT

Introduction: As adverse events following immunization causes serious concern, in the absence of direct threat from diseases mothers refrain from their children getting vaccinated. The Purpose of this present study is to assess Mother's Knowledge and Practices regarding Adverse Events Following Immunization in a rural area of Tripura.

Methodology: A community based cross sectional study has been conducted using Lot Quality Assurance Sampling Technique among mothers having children between 12 to 23 months old under Mohanpur Community Health centre area, with a sample size calculated to be 330. Data was collected using pre-designed pre-tested questionnaire and analysed using computer software SPSS version 20.0.

Results: Most of the mothers (90.0%) have knowledge about adverse events following immunisation (AEFI) and majority (82.1%) of them revealed - low grade fever, myalgia and gastro-intestinal upset, followed by local reaction- pain, swelling, redness (16.8%) to be the commonest AEFIs. Majority (20.9%) reported that their children had suffered from one or more of the similar adverse events in the past.

Conclusion: This study reveals majority of the mothers had knowledge about AEFI and they access health centres, consult local health workers at the time of AEFI of their children.

Key words: AEFI, knowledge, mothers, rural, Tripura

INTRODUCTION

Adverse event following immunization (AEFI) is defined as a medical incident that takes place after an immunization, causes concern, and is believed to be caused by immunization. Among them, AEFIs that are life threatening and those that result in hospitalization, disability or death are known as Serious AEFIs and a reaction that is not "serious" is known as Non-serious AEFI.¹

Basic childhood immunisation services are part of the essential health services in India and accorded

top priority in its health delivery system. The first official childhood vaccination policy was formally announced in 1978 at Alma Ata, Kazakhstan.² In 1985, India launched the Universal Immunization Programme (UIP) to protect all infants (0 - 12 months) against six serious but preventable diseases – tuberculosis, diphtheria, pertussis, tetanus, poliomyelitis, and measles by fully vaccinating at least 85 percent of all one-year-olds.³

Despite the importance of basic childhood immunisation, its coverage extends to only a minority of the children in the country, varies widely across

states, and differs by economic and social status of household. For example, in 2005-2006, 24.4 percent of children aged 12 - 23 months in the poorest quintile were fully immunised but 71% among the wealthiest quintile (Kumar & Mohanty).⁴

In the absence of a direct threat from disease, it is obvious most mothers will not undergo vaccination, more so in the face of adverse events⁵. In a study on what level of vaccine-related risks most parents will tolerate, in western Ontario, most mothers accepted risks ranging from one adverse event per 100,000 to 1 million vaccinations. However, 14 per cent would not accept any vaccine related risk at all.⁶

The commonly encountered adverse events that follow vaccination include pain at the injection site, swelling, and redness at the site of injection. Others are fever, rash, excessive crying, drowsiness or irritability⁵. Some though rarely may convulse, have anaphylaxis or encephalitis. We are not aware of any study in Tripura about the mother's perspective regarding adverse events that could follow immunization. It then becomes very imperative that the knowledge and practices of mothers about the adverse events following routine immunization in our scenario to be determined. This may provide an insight into the cause of dwindling immunization coverage.

OBJECTIVES

The objectives of this study were to assess the knowledge of mothers having children between 12

to 23 months age group regarding AEFI in Mohanpur area of Tripura; and to find the practices of the mothers related to AEFI.

MATERIALS AND METHODS

A community based cross-sectional study has been conducted in the rural field practice area under Department of Community Medicine, Agartala Government Medical College. All twenty two sub-centres under Mohanpur community health centre has been selected for the purpose of the study. Mohanpur is a sub-division situated in West Tripura district of Tripura, India, with a total population of 1, 04,830 as per state health records. Children of 12 to 23 months age-group residing in area under Mohanpur community health centre were the study population. It took 1 calendar year (from November 2013 to October 2014) for data collection, data analysis and writing up of report.

Lot Quality Assurance Sampling Technique has been used to calculate the required total sample population and number of mothers required from each lot (sub-centre). Mothers from each lot have been selected from the immunisation register who were having children within the age group of 12 to 23 months, available at each sub-centre by lottery method. Then those selected mothers were visited at their homes for interview.

Sample size calculation: sample size of 330 mothers, who have children between 12 to 23 months was calculated by steps mentioned in the box.

Calculation of Sample size:

- i. At 95% confidence interval and $\pm 5\%$ desired level of accuracy, the first estimate of total sample size is made based on accuracy level and confidence limit using Lemeshow and Taber LQAS table, which gives a sample size of 384 children.⁷
- ii. Estimation of target population = total population \times birth rate of state in rural \times (1 - infant mortality rate of the state, rural) \div 1000

Total population under Mohanpur community health centre area is 1, 04,830 (Birth rate of Tripura, rural areas was 15.6 per 1000 population. Infant mortality rate of Tripura, rural areas was 29 per 1000 live births).⁸ Therefore, target population = $104830 \times 15.6 \times (1 - 29 \div 1000) \div 1000 = 1588$ children.

- iii. Sampling fraction (%) ⁷ = total sample size \div target population \times 100 = $384 \div 1588 \times 100 = 24.181\%$.
As sampling fraction should be less than 10% total sample size is reduced by the formula
Revised total sample size ⁷ = total sample size \div (1 + sampling fraction) = $384 \div 1.241 = 309.4$.
For convenience of calculation 310 as the initial assessment of total sample size has been done.
- iv. Number of lots studied: here we had taken all the 22 sub-centres under Mohanpur community health centre as 22 distinct lots.
- v. Minimum lot sample size = revised total sample size \div number of lots = $310 \div 22 = 14.09$.

Therefore, 15 mothers have been selected from each lot.

The final sample size = $15 \times 22 = 330$ mothers, who have children between 12 to 23 months were interviewed.

Mothers who were willing to participate in the study were included and those who were not resident of Mohanpur area for six months or more

were excluded from the study. A pre-tested, semi-structured Questionnaire was developed to collect the required information. The information col-

lected using the above mentioned tools, is converted into a computer based spread sheet. All data have been expressed in terms of numbers and percentages. Analysis is done using SPSS version 20.0 statistical software. A duly informed written consent was taken from all the mothers before commencement of the study. The consent forms printed in both local language (Bengali) or English (for those who don't understand Bengali) and were signed by the respondents. Confidentiality regarding the information has been maintained throughout the whole study period. Ethical consideration has been taken from the Institutional Ethics committee, Agartala Government Medical College.

RESULTS

Knowledge of the Mothers regarding Adverse Events Following Immunisation (AEFI):

This study reveals that 297 (90.0%) mothers have heard about one or more types of AEFIs and when interviewed about the names of commonest AEFIs they know, majority 244 (82.1%) responded as low grade fever, myalgia and gastro-intestinal upset, followed by local reaction- pain, swelling, redness 50 (16.8%) and persistent inconsolable screaming for more than 3 hours after vaccination 3 (1.1%) as to be the commonest AEFIs respectively [Table 1].

Table 1: Frequency distribution of the commonest adverse events following immunisation the mothers are aware of.

| Variables | Frequency (n=297)(%) |
|--|----------------------|
| Local reaction - pain, swelling, redness | 50 (16.8) |
| Low grade fever, myalgia, gastrointestinal upset | 244 (82.1) |
| Persistent inconsolable screaming - > 3 hrs | 3 (1.1) |

Table 2: Measures taken by the mothers to manage the child during AEFI.

| Variables | Frequency (n=69)(%) |
|---|---------------------|
| Went to the health centre | 41 (59.4) |
| Went to private practitioner | 23 (33.3) |
| Consulted health worker & managed at home | 5 (7.3) |

When interviewed about any such adverse events occurred to the study children, 69 (20.9%) mothers answered positively and 261 (79.1%) responded that their children never suffered from any AEFI. Out of those children who suffered from AEFI, majority 42 (60.9%) had low grade fever, myalgia, gastro-intestinal upset where the rest 27 (39.1%) suffered from local reaction- pain, swelling, redness as informed by the mothers.

Table 3: Association of various socio-demographic factors with mother's knowledge about AEFI

| Variables | Knowledge on AEFI | | P value |
|----------------------------------|-------------------|-----------|--------------|
| | Yes (n=297) | No (n=33) | |
| Sex of the child | | | |
| Male | 173 (58.2) | 24 (72.7) | 0.135 |
| Female | 124 (41.8) | 9 (27.3) | |
| Respondent | | | |
| Mother | 289 (97.3) | 30 (90.9) | 0.086 |
| Father | 8 (2.7) | 3 (9.1) | |
| Religion | | | |
| Hindu | 209 (70.4) | 21 (63.6) | 0.657 |
| Christian | 77 (25.9) | 11 (33.3) | |
| Buddhist | 11 (3.7) | 1 (3) | |
| Social caste | | | |
| General | 44 (14.8) | 0 (0) | 0.015 |
| ST | 166 (55.9) | 22 (66.7) | |
| SC | 42 (14.1) | 9 (27.3) | |
| OBC | 45 (15.2) | 2 (6.1) | |
| | | | |
| Literacy status of Father | | | |
| Illiterate | 10 (3.4) | 4 (12.1) | 0.077 |
| Literate | 17 (5.7) | 3 (9.1) | |
| Primary education | 146 (49.2) | 17 (51.5) | |
| Secondary education | 108 (36.4) | 9 (27.3) | |
| Higher secondary | 16 (5.4) | 0 (0) | |
| Literacy status of mother | | | |
| Illiterate | 11 (3.7) | 4 (12.1) | 0.002 |
| Just Literate | 6 (2) | 0 (0) | |
| Primary education | 128 (43.1) | 23 (69.7) | |
| Secondary education | 150 (50.5) | 6 (18.2) | |
| Higher secondary | 2 (0.7) | 0 (0) | |
| Occupation of the father | | | |
| Unskilled labourer | 73 (24.6) | 12 (36.4) | 0.021 |
| Skilled labourer | 5 (1.7) | 3 (9.1) | |
| Farmer/fisherman/Agri | | | |
| -cultural enterprise | 121 (40.7) | 12 (36.4) | |
| Business | 77 (25.9) | 6 (18.2) | |
| Service | 21 (7.1) | 0 (0) | |
| | | | |
| Occupation of the mother | | | |
| Household work | 240 (80.8) | 18 (54.5) | 0.002 |
| Unskilled labour | 21 (7.1) | 7 (21.2) | |
| Farmer/fishing/Agri | | | |
| -cultural enterprise | 36 (12.1) | 8 (24.2) | |
| Total monthly income | | | |
| <Rs. 3000 | 84 (28.3) | 16 (48.5) | 0.118 |
| Rs. 3000 - 5000 | 175 (58.9) | 14 (42.4) | |
| Rs. 5000 - 10000 | 36 (12.1) | 3 (9.1) | |
| > Rs. 10000 | 2 (0.7) | 0 (0) | |
| | | | |
| Birth order of the child | | | |
| 1 | 170 (57.2) | 20 (60.6) | 0.728 |
| 2 | 122 (41.1) | 13 (39.4) | |
| 3 | 5 (1.7) | 0 (0) | |
| Place of delivery | | | |
| Home | 66 (22.2) | 13 (39.4) | 0.028 |
| Institutional | 231 (77.8) | 20 (60.6) | |

Practices by the mothers during AEFI of their children:

Table No. 2 shows that out of the total 69 children who suffered from AEFI, majority of the children 41 (59.4%) were taken to the nearest government health centre, followed by 23 (33.3%) taken to Private practitioner for treatment and rest (7.3%) of the children were managed at home by the local health worker.

Monetary burden on the family to manage a single AEFI of their child reveals 46 (66.7%) of the children were managed within a total of Rs.100 whereas the rest 23 (33.3%) of the children were managed within Rs.100-500 including cost of medicines, transport and doctor's fee (for private practitioners).

Chi square test reveals social caste, literacy status of mother, occupation of both the parents and place of delivery of the child were the socio-demographic variables having significant association with mother's knowledge regarding AEFI of their children as shown in Table No. 3. Binary logistic regression was done with the variables found significant on Chi square test showing mothers having education of above primary level had higher odds (OR= 3.265, 95% CI 1.229 - 8.677) than mothers of primary and below primary education as shown in Table No.4. The table also shows that mothers having occupation of business and service had lesser odds (OR= 0.334, 95% CI 0.120 - 0.924) of knowledge of AEFI as compared to mothers who were labourers (skilled and unskilled both).

Table 4: Binary Logistic Regression showing association of socio-demographic factors found significant on Chi square test with mother's knowledge about AEFI.

| Variables | Wald's statistic | P value | Odds ratio [Exp(B)] | 95% Confidence Interval | |
|----------------------|------------------|--------------|---------------------|-------------------------|--------|
| | | | | Lower | Upper |
| Caste Binary | | | | | |
| General | Reference | --- | --- | --- | --- |
| ST,SC,OBC | <0.001 | 0.997 | <0.001 | <0.001 | <0.001 |
| Mother's Literacy | | | | | |
| Primary and below | Reference | --- | --- | --- | --- |
| Above primary | 5.632 | 0.018 | 3.265 | 1.229 | 8.677 |
| Fathers Occupation | | | | | |
| Labourer | Reference | --- | --- | --- | --- |
| Business and service | 2.893 | 0.089 | 2.188 | 0.888 | 5.391 |
| Mothers Occupation | | | | | |
| Labourer | Reference | --- | --- | --- | --- |
| Business and service | 4.459 | 0.035 | 0.334 | 0.120 | 0.924 |
| Place of Delivery | | | | | |
| Home | Reference | --- | --- | --- | --- |
| Institutional | 0.541 | 0.462 | 1.352 | 0.606 | 3.017 |

DISCUSSION

This present study shows that majority (20.9%) of the mothers reported that their children had ever suffered from AEFI and out of them majority (60.9%) had low grade fever, myalgia, gastrointestinal upset where the rest 27 (39.1%) had suffered from local reaction- pain, swelling, redness.

Similar study conducted by N.D. Joshi et al in an Indian teaching hospital revealed that 20.8% of their study children had ever suffered from AEFI and the most frequent types of adverse reactions to vaccines were fever, excessive crying and injection site swelling similar to our study results.⁹ P. Bordoloi & B. Banerjee¹⁰ in their study at Gauhati Medical College & Hospital, Aherkar et al¹¹ in a study at a tertiary care hospital at Pune, V. Kompally et al¹² in a hospital based study at Warangal, R. A. Ogunyemi et al¹³ in their study among primary healthcare workers of Alimosho local government area of Lagos also revealed similar results.

This means the common AEFIs are almost similar irrespective of geographical location, population and difference among hospital based and community based survey reports.

Again in a study done by Nnenna TB et al in Enugu, south-east Nigeria to see mothers' knowledge and perception of AEFI, it was found that 72.3% of the respondents have heard of AEFI and the rest 27.7% had no idea.¹⁴ This shows our study respondents had better knowledge regarding AEFI (90%).

Unlike this present study, Ranganath BG in a study at Kolar¹⁵ on incidence of AEFI with Japanese Encephalitis (JE) vaccine found that pain at the injection site was the commonest side effect (14.37%), followed by swelling and redness (5.56%), fever lasting for more than 3 days (5.36%) respectively which may be because of larger sample and pain at injection site is common with JE vaccine.

Again this study revealed that mother's knowledge of AEFI of their children was significantly associated with higher literacy status of them and labourer by occupation of mothers than business and service as mothers' occupation. Similar results were found by Roos M Bernsen et al. in their study on mothers' knowledge, attitude and practices regarding immunization in United Arab Emirates.¹⁶ results also were consistent with the study findings of Calistus W Masika et al. on nurses Knowledge, perception and Practices of AEFI surveillance in Nairobi, Kenya.¹⁷

Underreporting of AEFI due to ignoring minor vaccination related reactions by mothers could be one of the major limitations of the study.

CONCLUSION

This present study reveals that majority of the mothers of our study children had knowledge about AEFI and at the time of AEFI of their children majority of them go to the government health centres or consult local health workers indicating good practice among the study population. Also knowledge of mothers regarding AEFI among their children was higher in mothers with higher literacy status meaning literacy status as a significant determinant of mothers' knowledge of AEFI.

REFERENCES

1. National Health Mission. Adverse events following immunization: Standard operating procedures. Ministry of Health and Family Welfare, New Delhi. 2010; p 5.
2. Alma-Ata, "Primary Health Care," Report of the International Conference on Primary Health Care, Alma-Ata, 6-12 September 1978, pp. 1-79.
3. UNICEF. Coverage evaluation survey: All India report [Online]. 2009 [Last accessed 2016 May 25]. Available from: [http://files.givewell.org/files/DWDA_2009/GAIN/UNICEF India Coverage Evaluation Survey \(2009\).pdf](http://files.givewell.org/files/DWDA_2009/GAIN/UNICEF_India_Coverage_Evaluation_Survey_(2009).pdf)
4. Abhishek K. and Mohanty S.K. Understanding the Factors Associated with Slow Progress in Childhood Immunization in India, XXVI IUSSP International Population Conference, Marrakech, 27 September-3 October 2009, pp. 1-11.
5. Kimmel SR (2002) Vaccine adverse events: separating myth from reality. *Am Fam Physician* 66: 2113-2120.
6. Freeman TR, Bass MJ (1992) Determinants of maternal tolerance of vaccine-related risks. *Fam Pract* 9: 36-41.
7. WHO: Monitoring Immunisation Services Using The Lot Quality Technique. WHO global programme for vaccines and immunisation, vaccine research and development. Geneva; 1996: p.1-57.
8. SRS bulletin. Sample registration system. Registrar general, India. 2011 Dec;46(1):1-6.
9. Joshi ND, Prajapati HK, Solanki KC, Sukhlecha A, Trivedi HR, Gajera MV, Vyas BR. Pattern of adverse events following immunization in an Indian teaching hospital. *Int J Med Sci Public Health*. 2013; 2(1): 62-68.
10. Bordoloi P, Banerjee B. Study on AEFI (adverse event following immunization) in the Department of Paediatrics, Gauhati Medical College & Hospital, Guwahati (Assam). *International Journal of Current Research*. 2016; 8(9): 38075-38078.
11. Aherkar RY, Deshpande PK, Ghongane BB. Study of the pattern of adverse events following immunization of children in a tertiary care hospital. *International Journal of Basic & Clinical Pharmacology*. 2016; 5(3).
12. Kompally V et al. Study of Adverse Events following Pentavalent Vaccination in a Tertiary Care Hospital. *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*. 2016 Oct; 15(10): 38-41.
13. Ogunyemi RA, Odusanya OO. A survey of knowledge and reporting practices of primary healthcare workers on adverse experiences following immunisation in alimosho local government area, Lagos. *Niger Postgrad Med J* 2016;23:79-85.
14. Nnenna TB, Davidson UN, Babatunde OI (2013) Mothers' Knowledge and Perception of Adverse Events Following Immunization in Enugu, South-East, Nigeria. *J Vaccines Vaccin* 4: 202.
15. Ranganath BG. Incidence of adverse events following immunization with SA 14-14-2 Japanese Encephalitis vaccine among children of 6 to 10 years in Kolar, India. *J Clin Biomed Sci* 2011; 1 (2):49-54.
16. Bernsen RM, Al-Zahmi FR, Al-Ali NA, Hamoudi RO, Ali NA, John Schneider J, et al. Knowledge, Attitude and Practice towards Immunizations among Mothers in a Traditional City in the United Arab Emirates. *J Med Sci*. 2011;4(3):114-21.
17. Masika W Calistus, Atili Harrysone, Were Tom. Knowledge, Perceptions, and Practice of Nurses on Surveillance of Adverse Events following Childhood Immunization in Nairobi, Kenya. *BioMed Research International*. 2016;1-10.