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Occupational Exposure to Needle Stick Injuries among Health Care Workers in a Teaching Hospital in Mangalore, Karnataka

Saba Mohammed Mansoor*, Brig Hemant Kumar**

Author Affiliation:
*Clinical Tutor, **Medical Superintendent & Professor, Dept. of Community Medicine, AJIMS & RC, Mangalore.

Reprint Request:
Brig (Dr) Hemant Kumar,
Medical Superintendent & Professor, Department of Community Medicine, A.J. Institute of Medical Sciences & Research Centre, Mangaluru, Karnataka- 575004.
E-mail:
doctorhemantkumar@Gmail.com

Abstract

Introduction:: Needle stick injuries(NSI) pose a significant occupational risk for transmission of blood borne diseases among health care workers. As a result, these workers are at much higher risk of occupational acquisition of blood borne diseases like HIV, hepatitis B and C. Further, needle stick injuries are often under reported. In USA 6,00,000 to 10,00,000 health care workers receive NSIs from conventional needles and sharps every year, while in UK it is 1,00,000 HCWs/year. In India, authentic data on NSI is not available. It is known that around 3-6 billion injections are given per year, of which 2/3rd injections are unsafe (62.9%) and the use of glass syringe is constantly associated with higher degree of un-safety. The average percutaneous transmission rates for hepatitis B (HBV) and C (HCV) are 33.3 (6-33%) and 3.3 per cent (1-10%), respectively, while the sero-conversion risk for HIV is 0.31 percent. Therefore, preventing NSI is an essential part of any blood borne pathogens prevention programme in the work place. The present study was undertaken to determine the incidence of NSI among various categories of health care workers (HCWs), the causal factors, the circumstances under which these occur in order to make necessary recommendations to prevent NSIs. *Material and Methods::* The study group comprised of 378 HCWs of various categories in present teaching hospital in Mangalore. Available records for last three years (2013-2015) were analysed specifically to identify various factors associated with NSIs. *Results:* A total of 378 HCWs were included in the study comprising of 49 resident doctors, 98 interns, 195 staff nurses and 36 technicians. During the period of study, a total of 96 cases of NSI were reported with an overall incidence of 25.39%. Recapping of needle was the most common procedure among the health care workers responsible for 55 (57.29%) of the occupational exposure. Highest incidence of NSI was found among nurses i.e. 41.66 % while the technician had lowest incidence i.e. 08.33 %. Hepatitis B vaccination status was found to be highest among residents i.e. 77.55%, while it was lowest 54.87% among staff nurses. Wards were the most common site for NSIs i.e. 54.16%. *Conclusions:* Needle stick injuries comprise an important occupational hazard for HCWs. While no NSI can be regarded as 'could not have been prevented' it is practically not feasible to avoid their occurrence altogether. However, their incidence can be minimized to a large extent. It is recommended that every hospital should develop a multi-pronged strategy to deal with NSIs. Besides health promotion and regularr training; there should be a surveillance mechanism in every hospital and also the facilities for prompt response and treatment of NSIs.

Keywords: Needle Stick Injuries(NSI); Hepatitis B; Occupational Exposure; Occupational Hazard.

Introduction

Health-care workers (HCWs) are at increased risk of infection with blood borne pathogens because of occupational exposure to blood and other body fluids due to percutaneous injuries with needles and other sharp objects contaminated with blood or body fluids [1-2]. More than twenty diseases can be transmitted due to needle stick injuries including Hepatitis B, Hepatitis C and HIV. According to World Health Organisation(WHO), out of 35 million health-care workers, 2 million experience percutaneous exposure each year; accounting for 37.6% of Hepatitis B, 39% of Hepatitis C and 4.4% of HIV infections around the world [3]. More than 90% of these infections occur in developing countries while majority of them

remain unreported. The occupational risk of needle stick injuries not only affects the quality of health care but also the safety and well-being of the providers. The HCWs who are employed in Operation Theatres, Labour and emergency rooms have even higher risk of exposure causing significant fear, anxiety and emotional distress [4]. However, needle stick injuries are completely preventable by observing strict universal precautions, immunization against Hepatitis B, provision of personal protective measures and the prompt management of exposures. In India, the data about occupational exposure to needle stick injuries is scarce [5].

In the backdrop of above, the present study was planned to determine the incidence of needle stick/ sharp injuries among HCWs and the circumstances under which these occured so as to evaluate and further enhance preventive measures .

Material and Methods

A record-based observational study was undertaken at a teaching hospital in Mangalore, Karnataka; to determine total number of reported needle stick/sharp /splash injuries among selected categories of HCWs and the circumstances under which these occured during a period of past three years i.e. from 01 Jan 2013 to 31 . Available relevant records were retrieved from the hospital and subsequently analysed. However, the study had the limitation of non inclusion of unreported cases.

Results

A total of 378 HCWs were included in the study comprising of 49(12.96 %) resident doctors, 98 (25.39 %) interns, 195(51.58%) staff nurses and 36 (9.52%) technicians (Table 1). During the period of study, a total of 96 cases of NSI were reported among the selected HCWs leading an overall incidence of 25.39 %. Out of these; 40 NSIs were reported during 2013 ; 22 during 2014, while remaining 34 NSIs were reported during 2015.

Analysis of NSIs based on procedure revealed, that recapping of needle was the most common procedure among the health care workers responsible for 55(57.29%) of the occupational exposure; followed by collection of the blood sample 18(18.75%), suturing 14(14.58 %) while the disposal of sharps was responsible for remaining 09(9.37 %) cases Figure-1).

In the present study, out of the affected HCWs, the highest incidence of occupational injury was found among nurses i.e. 40(41.66%, followed by residents 16(16.66 %), interns 32(33.33%) and lastly the Technician 08 (08.33 %) (Table 2).

Hepatitis B vaccination status among the HCWs under study was found to be highest among residents 38(77.55%), followed by interns 68(69.38%), technicians 25(69.44%) while the vaccination status was found to be lowest 107(54.87%) among staff nurses (Table-3).

Wards were the most common site for NSIs i.e. 52(54.16%) followed by emergency room 14(14.58%), operating rooms 11(11.45 %) while remaining 19(19.79%) NSIs accounted for the remaining cases (Figure-2).

Majority of needle stick injuries i.e. 69 (71.87 %) were from the hollow bore needle followed by solid bore needle 19 (19.79 %) while remaining injuries08 (08.33%) were caused by other objects. (Figure-3)

As regards observance of personal protective measures, in the present study only 4142.70%) of the health care workers were found to be using gloves at the time of injury. Further 63(65.62%) of the HCWs practiced hand hygiene i.e. washed their hands after NSI wound with soap and water while 81(84.37%) applied an antiseptic lotions/creams after hand wash. Out of 96 NSIs, 11 (11.45 %) HCWs

Table 1: Distribution of health care workers according to category (n=378)

Category of HCWS	Total HCWS	Percentage (%)
Residents	49	12.96
Interns	98	25.39
Staff nurses	195	51.58
Technicians	36	09.52
Total	378	100

Table 2: Distribution of occupational exposure among health care workers (n=378)

Category of HCWS	Total HCWS	NSIs	SPLASH	Total (%)
Residents	49	14	02	16(16.66%)
Interns	98	29	03	32(33.33%)
Staff nurses	195	35	05	40(41.66%)
Technicians	36	08	-	08(08.33%)
Total	378	86	10	96(100%)

Table 3: Status of hepatitis B vaccination among health care workers (n=378)

Category of HCWS	Total HCWS	Vaccinated	Not vaccinated
Residents	49	38 (77.55%)	11 (22.44%)
Interns	98	68(69.38%)	30 (30.61%)
Staff nurses	195	107(54.87%)	88(45.12%)
technicians	36	25(69.44%)	11(30.55%)
total	378	238 (62.96%)	140(37.03%)

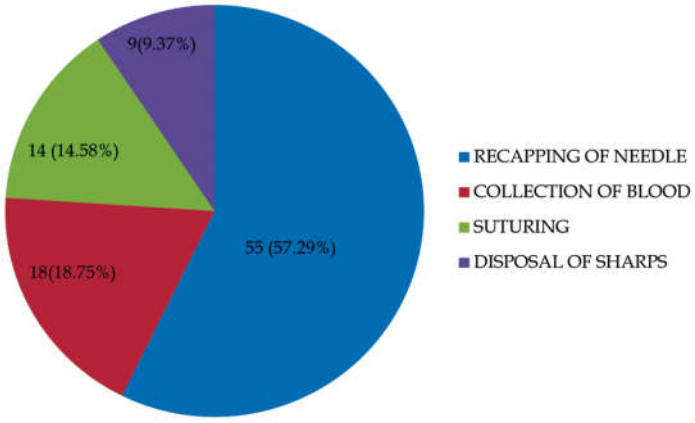
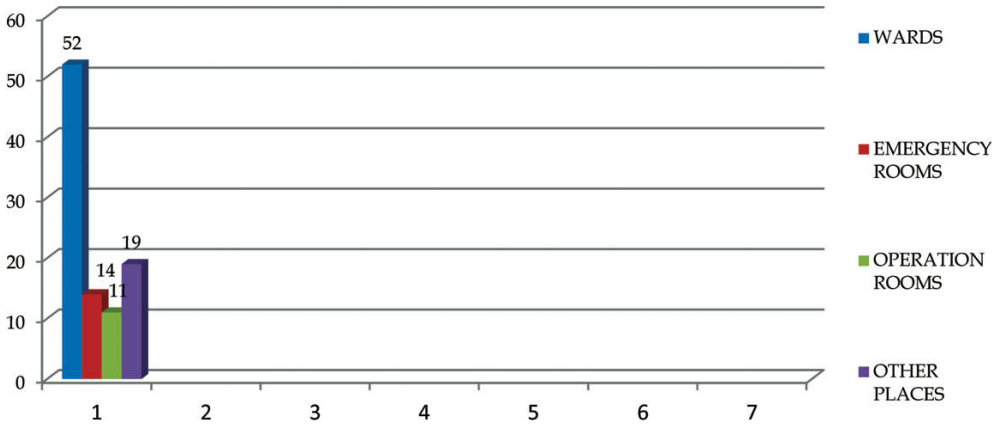
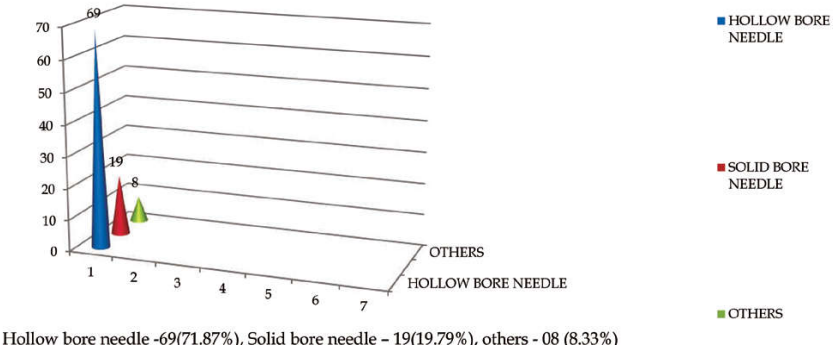


Fig. 1: Analysis of nsis based on procedure



Wards-52 (54.16%), Emergency Room-14(14.58%) Operating Rooms-11(11.45%), Others-19(19.79%)

Fig. 2: Incidences of nsis according to site of injury (n=96)



Hollow bore needle -69(71.87%), Solid bore needle – 19(19.79%), others - 08 (8.33%)

Fig. 3: Incidences of nsis according to type of needle (n=96)

were placed on post exposure prophylaxis for HIV. In present study, work overload and self-negligence were found to be the major risk factors for NSIs among HCWs.

Discussion

Health Care Workers are at increased risk of contracting blood borne infections due to their

occupational exposure to blood and other body fluids. The present study was undertaken to assess the proportion of needle stick injuries among HCWs in a tertiary care hospital. A total of 378 health care workers were included the study. The analysis of data on NSIs revealed that the staff nurses were most vulnerable to NSIs and sustained nearly two times more injuries as compared to any other category of HCWs. Several other studies have also shown high occurrence of NSIs among nurses [6-11]. This may be directly attributed to work overload in wards and shortage of staff which multiplies their patient load [12]. Ramos-Gomez F et al in 1991 stated that reason that increased vulnerability of injuries among nurses is due to the greater amount of time nurses spent in direct contact with patient [13].

Recapping was responsible for most of the injuries 55(57.57%), followed by collection of the blood sample (18.75%) while suturing accounted for 14 (14.58%) of the case. Several studies have shown recapping to be an important cause of NSIs [14-18]. However, recapping of needles has been prohibited under the Occupation Safety and Health Administration (OSHA) blood-borne pathogen standard [19].

The hollow bore needles were responsible for majority 69 (71.87 %) of needle stick injuries. Similar observations have also been made by many researchers in their studies [16]. The United States national surveillance system for health care workers has identified six important devices that are responsible for the majority of NSIs and other sharp related injuries and these are hypodermic needles (32%), suture needle (19%), winged steel needle (12%), scalpel blades, intravenous catheter stylets and phlebotomy needles (3%) [20].

In the present study wards were the most common site for NSIs 52 (54.16%) followed by emergency room 14(14.58 %). Similar findings have also been reported by the National Health Services in the Scotland where 53% injuries occurred in hospital wards, while 16% and 3% occurred in operation theatre and in emergency rooms respectively [21-22]. In our study work overload and self negligence were the major risk factor for NSIs among HCWs. Similar observations were also made by Sharma et al and Norsayani et al [10,17].

The study revealed poor observance of personal protective measures i.e. only 41(42.70%) of the health care workers were found to be using gloves at the time of injury. Further only 63(65.62%) of the HCWs washed their hands after NSI wound while 81(84.37%) applied an antiseptic lotions. Rambha Pathak et al in their study at Mullana. also reported a low observance of PPE by interns (45%), junior residents (42%), staff nurses (71%), student nurses (60%) and laboratory technicians(62%) [23].

In present study immunization status with Hepatitis B vaccine was found to be significantly higher among resident doctors and interns as compared to staff nurses, This shows the requirement of awareness about Hepatitis B vaccination among the nurses [24-27].

Conclusion

Percutaneous injuries, caused by needle sticks and other sharps, are a serious concern for all health care workers (HCWs) and pose a significant risk of occupational transmission of blood borne pathogens. While no NSI can be regarded as 'could not have been prevented' it is practically not feasible to avoid their occurrence altogether. However, their incidence can be minimized to a large extent. It is recommended that every hospital should develop a multi-pronged strategy to deal with NSIs. Besides health promotion and regular training; there should be a surveillance mechanism in every hospital and also the facilities for prompt response and treatment of NSIs. Issues requiring attention include use of safety engineered devices (SED), recording and reporting of incidents, training of all HCWs in handling and disposal of sharps, establishing a staff student health service and inculcating a responsible attitude among HCWs.

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Author Affiliation:
*Associate Professor, ****Professor and Head, Dept.of Community Medicine, **Professor and Head, ***Resident, Dept. of Paediatrics, *****Medical Intern, P.D.V.V.P.F'S Medical College, Vilad Ghat, Ahmednagar, Maharashtra- 414111.

Reprint Request:
Avachat Shubhada Sunil,
Asso. Prof. Dept.of community Medicine, P.D.V.V.P.F'S Medical College, Vilad Ghat, Ahmednagar, Maharashtra- 414111.
E-mail: shubhadasunil@gmail.com

Assessment of Knowledge and Practices Regarding Causes and Control of Diarrhea among Mothers of Under Five Children

Avachat Shubhada Sunil*, Mhaske Sunil N., Rathod Bipin***, Zambare Mrinal B.****, Eishwarya John*****

Abstract

Introduction: Diarrhoea is still a major killer of under five children in India. Mothers are the main care takers of children andto reduce the morbidity and mortality due to diarrhoea, they should have correct knowledge regarding prevention and control of childhood diarrhoea. Therefore the present study was conducted among mothers of under five children to assess their knowledge about prevention and control of diarrhea. *Methodology*: A cross sectional study was conducted among 115 mothers of under five children who had visited a teaching hospital (study setting) during study period. Data was collected by interviewing the mothers with the help of pre designed questionnaire. Data was analyzed by appropriate statistical techniques. *Results*: Approximately half of the participants had (50.4%) average knowledge, 24.3% had poor knowledge level. Only 46% of mothers were knowing at least one cause of diarrhea and unclean water was the most common cause perceived by them. 71% mothers heard about ORS and health workers was the main source of information for them. *Conclusion:* The knowledge was average and significantly better among educated women.

Introduction

Under Five Children are vulnerable segment of the population as they are more prone for communicable diseases like diarrhoea,respiratory infections which result into morbidity and sometimes mortality.

Diarrhoea is still a major killer of children under five, although its toll has dropped by a third over the past decade. Globally it killed more than 1600 children every day in 2012 [1]. Although the mortality due to diarrhea is declined the incidence of diarrhea is not much reduced.In India in the year 2013 ,about 10.7 million diarrhea cases with 1,535 deaths were reported [2].

Child health care practices have been recognized as a significant factor behind mortality rates among under five age group children[3]. Timely care seeking for diarrheal disease is positively related to survival [4]. Improving mothers' care-seeking behavior could also contribute in reducing a large number of child morbidity and mortality in developing countries.

Diarrhoea is more prevalent in developing countries like India largely due to lack of safe drinking water,poor hygiene and inadequate sanitation[5]. The problem of diarrhea can be tackled at both primary and secondary prevention levels.

Several studies have evaluated health care-seeking behavior and health care use among mothers in developing countries in relation to diarrheal diseases [6].

In the present study conducted among mothers of under five children in a teaching hospital, we have ass essed the knowledge regarding prevention and control of childhood diarrhea.

Methodology

Study design: A cross sectional study was conducted in a teaching hospital in urban area of Western Maharashtra.

Sampling technique and Sample Size: All the womenseeking health care during study period in the teaching hospital, having youngest child under five years of the age and who were ready to participate in the study were included in the study. A total 115 mothers of under five children participated in the study.

Data Collection: Data was collected with the help of pre designed questionnaire by interview technique. Questions were designed to assess knowledge and practices regarding causes,preventive measures and control of diarrhea. Both open ended as well as close ended questions were asked in local language while interviewing the mothers. Questions were related to following domains –causes of diarhhoea, preventive measures and control remedies for diarrhoea. Total 20 questions were asked and one mark was given for each correct answer,the knowledge level was categorized as poor if the score was less than 5, average if score was between >5-10, good if score was >10-15 and excellent if score was >15.

Statistical Analysis: Data was compiled, tabulated and analyzed by appropriate statistical techniques like mean, percentages, proportions. Chi square test was applied to test the association between variables.

Results

A cross sectional study was conducted among 115 mothers of under five children,to assess their knowledge about causes and prevention of childhood diarrhoea. Out of 115 women 39% women had child below one year, 49% had child in theage group of 1-3 years and 27% had child in the age group of >3-5 years. More than half ofparticipants (53%) confirmed that their kidshad 1-2 episodes of diarrhea during last one year, while 28% respondents told that their kids had more than three episodes of diarrhoea during the last year.

The mean knowledge score was 8.1. Approximately half of the participants had (50.4%) average knowledge ,24.3% had poor knowledge and only 20.8% and 4% women had good and excellent knowledge respectively.

Only 46% of mothers were knowing at least one cause of diarrhea and unclean water was the most common cause perceived by them (31%) followed by improper food (20%) and only 5.2% women could tell that infection as cause of diarrhea (Table 1).

Oral rehydration solution is the best remedy to control and manage diarrhoea, in our study about 71%mothers heard about ORS and health workers was the main source of information for them. More than half of them were knowing regarding preparation of ORS but hardly 9% of them could tell the role of ORS in diarrhea treatment (Table 2). However only 36.5% women were giving ORS to their children during diarrhea, plain water(62%), Rice kanji(45%), coconut water(18%) were the other home available fluids offered to children by them during diarrhea episode.

Regarding preventive measures for diarrhea, only 39% respondents knew that exclusive breast feedingfor first six months prevents diarrhea however majority of them (71%) reported that clean water and food prevents diarrhea while 26% respondents confirmed that hygiene is also important factor in diarrhea prevention. Control of housefly(31%) and safe waste disposal (22.6%) were the other preventive measures told by the respondents.

Knowledge regarding causes,prevention and control was significantly higher among educated mothers and diarrhea episodes were significantly less among kids of participants having higher knowledge level. Statistically significant association was observed between educational

Table 1: Knowledge regarding causes and mode of transmission of diarrhoea (Multiple response table)

Variable	No. of Respondents
Contaminated Water	36(31%)
Contaminated Food	24(20.8%)
Lack of hygiene	14(12.8%)
Infection	06(5.2%)

Table 2: Knowledge regarding management of diarrhea

Variable	Yes	No	Total
Heard about ORS	82 (71.30 %)	33(28.70%)	115
Knowledge about Preparation of ORS	67(58.26 %)	48(41.73%)	115
Knowledge about role of ORS	11 (9.56 %)	104 (90.43%)	115

Table 3: Knowledge about prevention of diarrhea (multiple response)

Preventive Measures	Yes	No	Don't Know	Total
Exclusive Brest Feeding	45 (39%)	11 (9.5%)	59 (51.3%)	115
Clean Water and Food	82 (71.3%)	18 (15.6%)	5 (4.3%)	115
Hygiene	30 (26.1%)	42 (36.5%)	43 (37.4%)	115
House Fly Control	36 (31.4%)	24 (20.8 %)	55 (47.8 %)	115
Sanitary Larine	26 (22.6%)	38 (15.6 %)	51 (44.3 %)	115

Table 4: Association of educational status and knowledge

Educational Status	Knowledge Score				
	< 5	>=5-10	> 10 -15	> 15	Total
Illiterate and Primary	23	30	3	1	57
Secondary and Higher Secondary	4	24	13	1	42
Graduate	1	4	8	3	16
Total	28	58	24	5	115

χ^2 =31.02 d.f.6 p<0.001 highly significant

Table 5: Association of knowledge and diarrhoea episodes among children

Knowledge Score	Episodes of Diarrhea Score			
	None	1-3	> 3	Total
< 5	9	12	7	28
> 5-10	12	29	17	58
> 10-15	12	11	1	24
> 15	3	1	1	5
Total	36	53	26	115

χ^2 =12.64 d.f.6 p<0.005 significant

status of women and knowledge level(p<0.005) and highly significant association was observed between knowledge level of mother and number of diarrhea episodes among their kids. (p<0.001)(Table 3 and 4).

Discussion

A cross sectional study was conducted among 115 women having under five child for their knowledge regarding causes, control and prevention of diarrhea.

In the present study more than half of the participants could not tell any single cause of diarrhoea and contaminated water was the most common cause perceived by them (31%), improper food(20%) and only 5% mentioned infection as a cause of diarrhoea, similar finding was observed by Mumtaz et al in their study conducted in Pakistan and Jamaiu et al in their study from Nigeria ,contaminated water was the most known cause of diarrhoea among the participants[7,8]. In other studies from India also contaminated water and food were the most common perceived causes among the participants [9,10].

Exclusive breast feeding, hygiene, environmental sanitation, safe water are the measures expected for prevention of diarrhoea. In present study majority of women felt that clean water and food are the important preventive measures and only few of them were able to report importance of hygiene, environmental sanitation in prevention of diarrhoea. Kevisetuo in his study conducted in urban slum also reported that 83% participants told clean water,19% participants told safe waste disposal, as the important measures for prevention of diarrhoea [10].

Oral rehydration therapy is mainstay of diarrhea treatment and in our study 58% women werecorrectly knowing about ORS preparation. In study conducted by Jamiu et al 59% women knew how to prepare ORS while only 32% women were knowing the preparation of ORS in study conducted by Shah et al [11].

Knowledge regarding home available fluids was better among the participants in our study and water, rice kanji, ORS, coconut water were the fluids offered by them to their kids during diarrhoea. Similar finding was obsereved by Choube at al and shah et al in their studies[11,12]. In our study 36% women told that they used ORS, similar to this, 46%women used ORS in study conducted by Rasania et al.

Higher education levels were significantly associated with higher knowledge level in our study(p,0.005)similar finding was observed in studies conducted by Suman et al, Kevisetuo in India and Ansari et el in Nepal [9,10,14].

Findings in our study reaffirms the importance of women's knowledge in reducing diarrhoea morbidity among their children. Children of mothers having higher knowledge significantly had less diarrhoea morbidity,(p<0.001).

Conclusion

Diarhhoea is a common infection among under five children and mothers should have proper knowledge regarding causes, prevention and control but in present study the knowledge level was average. Though ORS awareness was good correct knowledge of its preparation was lacking. Mothers education had significant association with the knowledge about diarrhoea.

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Original Article

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Rotavirus Diarrhea in a Coastal Medical College: A Pilot Study

N. Ganga

Author Affiliation:
Professor, Department of Pediatrics,
Vinayaka Mission's
Medical College & Hospital,
Karaikal, Puducherry-609609, India.

Reprint Request:
N. Ganga, 39, John Selvaraj Nagar,
Kumbakonam – 612001,
Tamil Nadu, India.
E-mail: gangs.mythila@gmail.com

Abstract

Background: Acute diarrheal disease due to Rotavirus is prevalent in the community. Severe dehydration results in mortality, if not intervened in time. *Aim:* This study was undertaken to identify Rotavirus antigen in stools, to study the influence of age, sex and feeding pattern and to analyse the outcome. *Settings and design:* Prospective, non-randomized, non-controlled, analytical, hospital based study done during 2013-2015. *Materials and methods:* Children less than 5 years with acute watery diarrhea were the study subjects. A commercial kit with Latex Agglutination method was used to identify Rotavirus antigen in freshly passed stool. Children were treated in the standard way, either as out-patient or hospitalised depending on clinical situation. *Results:* Of the 211 motion specimens tested, 37 (17.5%) were positive for Rotavirus antigen. Twenty-two (59.5%) were infants. Children of both sex, either breastfed or bottle fed were equally affected. 75.7% were hospitalised. Mean duration of hospital stay was 7 days. No mortality. *Conclusion:* Children of both sex, irrespective of feeding pattern were prone for Rotavirus diarrhea. Infants were at high risk of infection. Early hospitalisation could have prevented mortality.

Keywords: Infants; Latex Agglutination; Rotavirus.

Introduction

Acute diarrheal disease is still a cause of mortality and morbidity among under five children in India. 13% of death are due to diarrhea and about 3,00,000 children die annually[1]. Rotavirus is the leading cause of severe diarrhea in Indian children which is about 40% [2]. Gladstone B.P et al have estimated the burden of Rotavirus infection in 2011. It was shown that 48% children experienced at least one episode of rotavirus diarrhea by the age of 3 years [3].

Though viral culture is beyond scope of many health facilities, simpler screening methods can be utilized to confirm the etiology for better case management.

Materials and Methods

Aims and Objectives

- To identify rotavirus in stool specimens
- To correlate age and sex with rotavirus prevalence
- To study the influence of feeding pattern
- To analyze the outcome.

Study Design

Prospective, non randomized, non controlled hospital based, analytical study.

Study Period

June 2013 to June 2015.

Methodology

Less than 5 years old children presenting with acute onset of loose stools were included in the study. Complete clinical examination was done. Based on general condition, fever, vomiting, urination status and degree of dehydration, children were hospitalized or treated as outpatient. The protocol as per Acute Diarrheal Disease Control Programme and

Integrated Management of Neonatal and Childhood Illnesses (IMNCI) were used to treat the children.

Freshly passed stools were collected and Latex Agglutination (LA) test was done utilizing the kit. The commercial kit was obtained from Plasmatic Laboratory Products, United Kingdom.

0.2 gram of feces was added to 1.6ml of distilled water and 0.4ml of buffer. The mixture was centrifuged for 10 minutes at 3000rpm. One drop of the supernatant fluid was added to the Latex reagent and viewed under microscope. Visible agglutination was taken as Rotavirus antigen positive.

The services of Swasti Diagnostics, Kumbakonam were utilized initially to standardise the kit.

Inclusion Criteria

1. Children less than 5 years of age.

2. Children with acute watery diarrhea of less than 10 days duration.

3. Children whose parents gave consent for the study.

Exclusion Criteria

1. Children with Blood and/or mucus in stools.

2. Children with comorbid conditions.

Limitation of Study

1. Small Sample Size.

2. Not randomized and not controlled.

3. Enzyme-Linked Immunosorbent Assay (ELISA), Polyacrylamide Gel Electrophoresis (PAGE) and viral culture could not be done for want of facilities.

Results

Total

n: 211

Sex

Male : 120 (56.9%)

Female : 91 (43.1%)

Age in months

< 6 : 56 (26.5%)

7/12 to 12 : 79 (37.4%)

13 to 36 : 65 (30.8%)

36 to 60 : 11 (5.2%)

Rotavirus Antigen Status

Rota virus Positive : 37 (17.5%)

Rota virus Negative : 174 (82.5%)

Sex vs Rota Virus Positivity

Male : 19 (51.4%)

Female : 18 (48.6%)

Age vs Rotavirus Positivity

Age in months

Less than 6 : 4 (10.8%)

6 to 12 : 18 (48.6%)

13 to 36 : 12 (32.4%)

37 to 60 s : 3 (8.1%)

Infants = 22 (59.5%)

Feeding vs Rota Virus positivity

Breastfeeding = 14 (37.8%)

Artificial Feeds/ Bottle : 11(29.7%)

Table 1: Few selected similar studies

S. No.	Year	Place	Rota Positivity	Season	More Affected Sex	More Affected Age	Method
1	1993	Tirupati, India	24%	Winter	Males	Up to 18 months	ELISA
2	2000	Brazil	17.9%	Rainy	Males	Up to 2yrs	LA
3	2004	Mumbai, India	10.9%	Winter	--	Infants	ELISA
4	2010	Brazil	25%	Rainy	Males	Infants	Virus Culture
5	2011	Thailand	37.5%	--	Males	Infants	Immuno Chromatography
6	2011	Saudi, Arabia	81%	No Seasonal Variation	Males	Infants	ELISA
7	2012	Karnataka, India	32.3%	Spring	Males	Up to 24 months	PAGE / ELISA
8	2013	Iraq	45.76%	Winter	Females	Up to 2yrs	ELISA, LA
9	2013	Pune, India	38%	Winter	Males	Infants	ELISA
10	2013	Iran	35%	Summer	No difference	Infants	ELISA
11	2014	Kerala, India	35.9%	Spring		Slightly more in Infants	ELISA

Combinations : 12 (32.4 %)

Treatment of Rota Virus Positive Children

n = 37

In Patient : 28 (75.7%)

Out Patient : 9 (24.3%)

Mortality: NIL

Discussion

In this pilot study, utilizing Latex Agglutination (LA) test as a screening tool, 37 (17.5%) motion specimens were positive for Rotavirus Antigen. This is lesser than Venkatesh V.N. et al (Karnataka 2012) who has observed 32.3%; [4] Sanjay Chavan et al (Pune 2013) who has reported 38% [5] and Mathew M.A. et al (Kerala 2014) who found 35.9% [6]. ELISA testing was used in the above studies. A study by Younis Abdul Redha et al (Iraq 2013) has proved that the specificity and sensitivity of both LA and ELISA were comparable [7]. Hence the lesser incidence cannot be attributed to the method of screening.

The results are comparable to a data in Brazil in 2000 by Jose Fernandes et al with LA who has observed 17.9% positivity [8].

The quoted studies were done during winter when the rate of infection will be high. The present study did not concentrate on season since it was year wise hospital data.

Analysis of results reveal that children less than one year were more infected with rotavirus. Four (10.8%) babies were less than 6 months of age and 18 (48.6%) were between 6 months to 12 months of age, who were mostly affected. Out of 37, infants were 22 (59.5%), contributing to 2/3 of victims. This is on par with earlier quoted studies.

There is no obvious sex difference in Rotavirus positivity in this study. (i.e.) males 19(51.4%) and females 18 (48.6). Majority studies referred in Table I show males prevalence. This is comparable to study from Iran in 2013 by Tahereh Ziaei Kajbaf et al, who also observed equal involvement of both males and females [9]. A study from Iraq by Younis Abdul Redha et al in 2013 reports female preponderance [7].

Though breast feeding is advised to prevent gastrointestinal infection, this study revealed that 14 (37.8%) babies were on breast feeds only, while 11 (29.7%) were on bottle feeds and 12(32.4%) were on both. The Rotavirus positivity is not much influenced by feeding. Multicentric studies with more sample size are needed to support this observation.

Twenty-eight (75.7%) children reported with moderate or serve dehydration, higher purge rate, fever and/or vomiting which warranted hospitalization.

Since supportive therapy, mainly rehydration either with oral rehydration solution and/or intravenous fluids was initiated in time, there was no mortality.

Conclusion

Rotavirus infection is prevalent in this community. Since infants were affected more, prevention by vaccination is the need of the hour. Health education and social marketing of information about the danger signs in diarrhea is essential since prompt hospitalization can prevent death.

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Review Article

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Zika: The Newly Emerging Threat to Mankind

Bratati Banerjee*, Rupsa Banerjee**

Author Affiliation:
*Professor, Department of Community Medicine Maulana Azad Medical College, New Delhi. **PG cum Tutor, Department of Community Medicine Kempegowda Institute of Medical Sciences, Bangalore.

Reprint Request:
Bratati Banerjee,
Professor, Department of Community Medicine, Maulana Azad Medical College, Bahadur Shah Zafar Marg, New Delhi – 110002.
Email: bratati1@hotmail.com

Abstract

Zika virus disease, first identified in Zika forest of Uganda in Africa, is a newly emerging threat that has been responsible for outbreaks in Brazil and 22 other countries and territories in America within the last few years.

The disease is caused by a Flavivirus and transmitted by Aedes aegypti mosquito. It may also be transmitted through vertical, sexual and parenteral routes, though these are rare. Anyone not previously exposed to the virus and who lives in an area where the mosquito is present, and where imported or local cases have been reported, may be infected. The disease is usually mild and can last for 2-7 days. Symptoms are similar to those of dengue or chikungunya. However, Zika does not have clearly characteristic features, but most patients have skin rashes and some have conjunctivitis.

The public health alarm lies in the fact that the outbreak in Brazil is associated with a steep rise of Guillain-Barre syndrome and pregnant women giving birth to babies with birth defects, most common being microcephaly, and poor pregnancy outcomes. Hence the World Health Organization has declared the recent cluster of microcephaly cases and other neurological disorders reported in Brazil, following a similar cluster in French Polynesia in 2014, a Public Health Emergency of International Concern (PHEIC) and has issued Temporary Recommendations under IHR (2005).

India is also at risk, as being a new virus the entire population is susceptible, lacking immunity to it. Also the Aedes mosquito is widespread in the country and the climatic conditions, temperature, and humidity of the country are favourable for transmission of the disease. Hence public health measures must be widely implemented throughout the country to prevent an epidemic. Based on the Recommendations of WHO, the Ministry of Health & Family Welfare, Government of India has issued guidelines for prevention and control of Zika virus disease in India.

Keywords: Zika; Virus; Aedes Mosquito; Microcephaly; Guillain-Barre Syndrome; Brazil Outbreak.

Background

Zika is an emerging public health threat caused by a flavivirus that was first isolated in rhesus monkeys in the Zika forest of Uganda, through a monitoring network of sylvatic yellow fever. It was subsequently identified in humans in 1952 in Uganda and the United Republic of Tanzania [1]. Initially it was confined to Africa, but later outbreaks of Zika virus disease were recorded in the Americas, Asia and the Pacific also. In 2007, a major epidemic was reported on the island of Yap (Micronesia), where nearly 75% of the population was infected [2].

In 2013 Zika virus disease outbreaks were reported from French Polynesia [1]. On 3rd March 2014, Chile notified PAHO/WHO that it had confirmed a case of indigenous transmission of Zika virus on Easter Island, where the virus continued to be detected until June 2014 [2]. In May 2015, the public health authorities of Brazil confirmed the transmission of Zika virus in the northeast of the country, following which PAHO issued an alert [2,3]. Since then, the disease has spread within Brazil and to 22 other countries and territories in the region, indicating rapid geographic expansion of Zika virus. The outbreak in Brazil is associated with a steep rise of Guillain-Barre syndrome and pregnant women giving birth to babies with birth defects, most common being microcephaly, and poor pregnancy outcomes [4].

Epidemiology [1-5]

- Agent– A virus which is a member of the Flaviviridae virus family and the Flavivirus genus, also known as Zika virus as it was first isolated from the Zika forest of Uganda. Since it is transmitted by infected mosquitoes it is also under Arbovirus.
- Vector– Aedes mosquito, mainly Aedes aegypti in tropical regions. This is the same mosquito that transmits dengue, chikungunya and yellow fever.
- Host– Anyone not previously exposed to the virus and who lives in an area where the mosquito is present, and where imported or local cases have been reported, may be infected.
- Reservoir – Unknown.
- Environment– Climatic conditions, temperature and humidity of Tropical countries facilitate transmission of the disease.
- Mode of transmission– The virus is transmitted in several ways.
  - ☞ Vector borne - Through bite of Aedes aegypti mosquito.
  - ☞ Vertical - A mother already infected with Zika virus near the time of delivery can pass on the virus to her newborn around the time of birth, but this is rare. It is possible that Zika virus could be passed from mother to fetus during pregnancy. There are no reports of infants getting Zika virus through breastfeeding. Because of the benefits of breastfeeding, mothers are encouraged to breastfeed even in areas where Zika virus is found.
  - ☞ Sexual - The virus has also been isolated in semen, and one case of possible person-to-person sexual transmission has been described, but not confirmed.
  - ☞ Parenteral - Zika can be transmitted through blood, but this is an infrequent mechanism.
- Incubation period– It is not clear, but is likely to be a few days to weeks.

Clinical Features

About 1 in 4-5 people infected with Zika virus become ill i.e., develop Zika [2,3]. Among those who do, the disease is usually mild and can last for 2-7 days. Symptoms are similar to those of dengue or chikungunya, which are transmitted by the same type of mosquito. The most common symptoms of Zika virus infection are mild fever and exanthematous rashes, usually accompanied by conjunctivitis, muscle or joint pain, headache and general malaise that begin 2-7 days after the bite of an infected mosquito. Neurological and autoimmune complications are infrequent, but have been described in the outbreaks in Polynesia and Brazil [1,2]. Severe disease requiring hospitalisation is uncommon. Deaths are rare [3]. However, in patients with preexisting diseases or conditions, sporadic cases have been reported of more serious manifestations and complications, causing death [2].

Complications [3,4]

- During the Brazil outbreak microcephaly and other poor pregnancy outcomes were observed in babies of mothers who were infected with Zika virus while pregnant.
- An increase in Guillain-Barré syndrome (GBS) has been observed in areas where a Zika virus epidemic has been documented e.g., in French Polynesia and Brazil. GBS is a condition in which the immune system attacks the nervous system, sometimes resulting in paralysis.

However, a causal relationship between Zika virus infection and birth defects and neurological syndromes has not been established, though strongly suspected.

Difference between Zika, Dengue, and Chikungunya [2]

- Zika does not have clearly characteristic features, but most patients have skin rashes and some have conjunctivitis.
- Dengue usually presents with higher fever and more severe muscle pain. There can be haemorrhagic manifestations when the fever breaks.
- Chikungunya presents with higher fever and more intense joint pain, affecting the hands, feet, knees, and back. It can disable people, bending them over so that they cannot walk or perform simple activities of daily living.

Diagnosis [1,2]

In most people, diagnosis is based on clinical symptoms and epidemiological circumstances such as Zika outbreak in the patient's area or visit to areas where the virus is circulating.

Blood tests can help to confirm the diagnosis. Some tests like virological PCR tests, are useful in the first 3-5 days after the onset of symptoms, while

serological tests that detect the presence of antibodies are useful only after five days [2]. Diagnosis by serology can be difficult as the virus can cross-react with other flaviviruses such as dengue, West Nile and yellow fever. Virus isolation can also be done from blood samples [1]. Zika virus usually remains in the blood of an infected person for a few days but it can be found longer in some people [2].

Once it has been demonstrated that the virus is present in a given area or territory, confirmation of all cases is not necessary, and laboratory testing will be adjusted to routine virological surveillance of the disease [2].

Management [1,3]

Zika virus disease is usually relatively mild and requires no specific treatment other than symptomatic. People sick with Zika virus should get plenty of rest, drink enough fluids to prevent dehydration, and treat pain and fever with common medicines such as acetaminophen. Aspirin and other non-steroidal anti-inflammatory drugs (NSAIDs), like ibuprofen and naproxen should be avoided until dengue can be ruled out, to reduce the risk of hemorrhage.

Prevention [1-5]

Prevention involves reducing mosquito populations through source reduction and reducing contact between mosquitoes and people, thus avoiding bites which occur mainly during the day. Eliminating and controlling Aedes aegypti mosquito breeding sites reduces transmission of three diseases i.e. Zika, chikungunya, and dengue. An integrated response is required, involving action in several areas, including health, education, and the environment.

- *Source Reduction*

This can be done by removal and modification of breeding sites. Collection of water in outdoor containers like flower pots, bottles, and vessels should be avoided so that they do not become mosquito breeding sites. Domestic water tanks should be covered so that mosquitoes cannot get in. Garbage should be placed in closed plastic bags and kept in covered containers. Drains should be unblocked to allow free flow of water.

- *Reduction of Contact between Mosquitoes and People*

This can be done by using insect repellent; wearing clothes that cover as much of the body as possible and preferably light-coloured; using physical barriers such as screens, closed doors and windows; using mosquito repellants and sleeping under mosquito nets which may be treated with insecticides. Special attention and help should be given to those who may not be able to protect themselves adequately, such as young children, the sick or elderly people.

- *Prevention of Transmission from Cases*

People suffering from Zika should avoid mosquito bites during the first week of illness by restricting movement and sleeping under nets, so as to stop transmission of the disease to the healthy population, through vectors.

- *Outbreak Response*

Spraying of insecticides should be carried out during outbreaks. Insecticides recommended by the WHO Pesticide Evaluation Scheme may also be used as larvicides to treat relatively large water containers.

- *Travel Precaution*

Travellers should take the basic precautions to protect themselves from mosquito bites.

- *Prophylaxis*

There is no vaccine or medicines to prevent Zika infection. However, developing a vaccine is currently considered.

WHO Response

WHO is supporting countries to control Zika virus disease through [1]:

- strengthening surveillance;
- building capacity of laboratories to detect the virus;
- working with countries to eliminate mosquito populations;
- preparing recommendations for the clinical care and monitoring of persons with Zika virus infection; and
- defining and supporting priority areas of research into Zika virus disease and possible complications.

An International Health Regulations Emergency Committee was convened by the WHO on Zika virus

and increase in neurological disorders and neonatal malformations was observed. Based on the advice of this Committee, the Director-General, on 1st February 2016, declared the recent cluster of microcephaly cases and other neurological disorders reported in Brazil, following a similar cluster in French Polynesia in 2014, a Public Health Emergency of International Concern (PHEIC). The Director-General endorsed the Committee's advice and issued them as Temporary Recommendations under IHR (2005) [4].

Temporary Recommendations under IHR (2005) [4]

The Committee highlighted the importance of aggressive measures to reduce infection with Zika virus, particularly among pregnant women and women of childbearing age, and gave the following recommendations.

- *Zika Virus Transmission*

- Surveillance for Zika virus infection should be enhanced, with the dissemination of standard case definitions and diagnostics to at-risk areas.
- The development of new diagnostics for Zika virus infection should be prioritized to facilitate surveillance and control measures.
- Risk communications should be enhanced in countries with Zika virus transmission to address population concerns, enhance community engagement, improve reporting, and ensure application of vector control and personal protective measures.
- Vector control measures and appropriate personal protective measures should be aggressively promoted and implemented to reduce the risk of exposure to Zika virus.
- Attention should be given to ensuring women of childbearing age and particularly pregnant women should have the necessary information and materials to reduce risk of exposure.
- Pregnant women who have been exposed to Zika virus should be counselled and followed for birth outcomes based on the best available information and national practice and policies.

- *Longer-Term Measures*

- Appropriate research and development efforts should be intensified for Zika virus vaccines, therapeutics and diagnostics.
- In areas of known Zika virus transmission health services should be prepared for potential increases in neurological syndromes and/or congenital malformations.

- *Travel Measures*

- There should be no restrictions on travel or trade with countries, areas and/or territories with Zika virus transmission.
- Travellers to areas with Zika virus transmission should be provided with up to date advice on potential risks and appropriate measures to reduce the possibility of exposure to mosquito bites.
- Standard WHO recommendations regarding disinfection of aircraft and airports should be implemented.

- *Data Sharing*

- National authorities should ensure the rapid and timely reporting and sharing of information of public health importance relevant to this PHEIC.
- Clinical, virologic and epidemiologic data related to the increased rates of microcephaly and/or GBS, and Zika virus transmission, should be rapidly shared with WHO to facilitate international understanding of these events, to guide international support for control efforts, and to prioritise further research and product development.

In the coming weeks, WHO will convene experts to address critical gaps in scientific knowledge about the virus and its potential effects on fetuses, children and adults. WHO will also prioritise the development of vaccines and new tools to control mosquito populations, as well as improving diagnostic tests [4].

Threat to India

The disease has not yet been reported in India. However, there are several factors for rapid transmission of Zika virus that have been documented in other countries, which are applicable to India also. These are:

1. Since this is a new virus, the entire population is susceptible, lacking immunity to Zika virus.
2. The Aedes mosquito is widespread in the country.
3. The climatic conditions, temperature, and humidity of the country are favourable for transmission of the disease.

Hence the entire population of India is vulnerable to developing Zika disease. The Zika virus can get imported into India in two ways:

i. Through infected travelers i.e. clinical and subclinical cases

ii. Through infected mosquitoes.

There is currently no international guideline regarding isolation of travellers from Zika affected countries. But, import of mosquitoes is not likely to happen because of India's policy to keep the Aedes aegypti index at international airports and seaports at less than 1, along with aerosol spray of aircrafts and ships, as preventive measures for Yellow Fever. There is no vaccine or drug available to prevent or treat Zika virus disease at present. However research is going on for the same.

Guidelines for India on Zika Virus Disease following Epidemic in Brazil and other countries of America [5]

Based on the Recommendations of WHO, the Ministry of Health & Family welfare, Government of India has issued guidelines for prevention and control of Zika virus disease in India. These guidelines are available on the Ministry's website http://www.mohfw.nic.in.

Travel Advisory for Zika Virus Disease in India [5]

- Non-essential travel to the affected countries to be deferred/ cancelled.
- Pregnant women or women who are trying to become pregnant should defer/ cancel their travel to the affected areas.
- All travelers to the affected countries/ areas should strictly follow individual protective measures, especially during day time, to prevent mosquito bites (use of mosquito repellant cream, electronic mosquito repellants, use of bed nets, and dress that appropriately covers most of the body parts).
- Persons with co-morbid conditions (diabetes, hypertension, chronic respiratory illness, immune disorders etc) should seek advice from the nearest health facility, prior to travel to an affected country.
- Travelers having febrile illness within two weeks of return from an affected country should report to the nearest health facility.
- Pregnant women who have travelled to areas with Zika virus transmission should mention about their travel during ante-natal visits in order to be assessed and monitored appropriately.

Conclusion

Zika virus disease, first identified in Zika forest of Uganda in Africa, is a newly emerging threat that has been responsible for outbreaks in Brazil and 22 other countries and territories in America within the last few years. Though the disease is mild, the public health alarm lies in the fact that the outbreak in Brazil is associated with a steep rise of Guillain-Barre syndrome and pregnant women giving birth to babies with birth defects, most common being microcephaly, and poor pregnancy outcomes.

India is also at risk of the disease as being a new virus the entire population is susceptible, lacking immunity to it. Also the Aedes aegypti mosquito, which is the vector responsible for transmission of Zika virus, is widespread in the country and the climatic conditions, temperature, and humidity of the country are favourable for transmission of the disease. Hence public health measures must be widely implemented throughout the country to prevent an epidemic.

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Author Affiliation:
*Assistant Professor,
Ananthapuri College of Nursing,
**Assistant Professor
Government College of Nursing
Thiruvananthapuram, Kerala.

Reprint Request:
Athirarani M.R.,
Assistant Professor
Government College of Nursing
Thirvananthapuam, kerala-680596.
E-mail: athiraaparna@gmail.com

Rubella Vaccine: Is It Mandatory for Adolescent Girls

Premini S.*, Athirarani M.R., Asha K.V.****

Abstract

Infant mortality is considered as an important indicator of the health status of a community. Any reduction in infant mortality in developed countries will depend upon preventing one of its principal causes that is congenital anomalies. The decline in Infant mortality has been attributed to improved perinatal care, and better control of communicable diseases through proper vaccination. Maternal infections such as TORCH also contribute to the development of congenital malformations. It also highlights the health care importance in the preconceptional period. By giving more attention to this, now Rubella vaccine is included in the immunization schedule for adolescent girls as they are the prospective mothers. Infant death audit reveals that 50% of infant deaths are due to congenital anomalies and other brain related injuries. Most of the congenital anomalies are due to genetic causes except some develops due to vaccine preventable diseases like rubella. In order to overcome this problem, some preventive measures have to be taken like vaccination.

Keywords: Rubella; German measles; Adolescent; Congenital anomalies.

What is Rubella?

The name rubella is derived from Latin, meaning "little red." Rubella was initially considered to be a variant of measles or scarlet fever and was called "third disease". It was first described as a separate disease in the German medical literature, hence the common name "German measles". Following a widespread epidemic of rubella infection in 1940, Norman Gregg, an Australian ophthalmologist, reported in 1941 the occurrence of congenital cataracts among 78 infants born following maternal rubella infection in early pregnancy. This was the first published recognition of congenital rubella syndrome (CRS). Rubella virus was first isolated in 1962 by Parkman and Weller [1].

Rubella or German measles is an acute childhood infection, usually mild, of short duration (approximately 3days) and accompanied by low-grade fever, and a macular papular rash. Infection in early pregnancy may result in serious congenital defects including death of the foetus. The disease is worldwide in distribution and tends to occur in epidemics, in non-immunised populations, every 6 to 8 years.

It is caused by an RNA virus of the toga virus family and mainly affects children particularly in the age group of 3-10 yrs. Clinical or sub clinical cases are considered as source of infection. The virus is transmitted by droplets from nose and throat. Incubation period is 2-3 weeks. Clinical manifestations include low grade fever, coryza, sore throat, enlargement of post auricular and posterior cervical lymph nodes which usually appears 7 days before the appearance of rash. It appears first on face and spreads rapidly to trunk and extremities and which is considered as the first indication of the disease in children. Definitive diagnosis of rubella is possible only through virus isolation and serological tests such as haemagglutination inhibition test, ELISA and radio-immune- assay and throat swab is recommended for virus isolation [5]. Complications include arthralgia, arthritis, encephalitis, orchitis, neuritis and haemorrhagic manifestations like thrombocytopenic purpura [1].

Why is it Important

Rubella, though a mild, vaccine-preventable disease, can manifest with severe teratogenic effects

in the fetus labelled as congenital rubella syndrome due to primary maternal rubella infection. Despite a reduction in disease burden of several vaccine-preventable diseases through childhood immunization, CRS continues to account for preventable severe morbidity including childhood blindness, deafness, heart disease, and mental retardation [2]. CRS refers to infants born with defects secondary to intrauterine infection or who manifest symptoms or signs of intrauterine infection sometimes after birth. Congenital infection with rubella virus can affect virtually all organ systems. The severity of the effects of rubella virus on the foetus depends largely on the time of gestation at which infection occurs. As many as 85% of infants infected in the first trimester of pregnancy will be found to be affected and defects are rare when infection occurs after the 20th week of gestation [1].

Rubella infection inhibits cell division, and this is probably the reason for congenital malformation and low birth weight. The classic triad of congenital defects are deafness, cardiac malformations and cataracts. Other resulting defects include glaucoma, retinopathy, microcephalus, cerebral palsy ,intrauterine growth retardation, hepato splenomegaly, mental and motor retardation [5].

In industrialized countries, severe congenital anomalies account for more than 20 percent of infant mortality and cause the largest number of years of life lost. As per the estimated incidence in 1989, congenital malformations accounts for 17-30/1000 live birth. The causes for this include genetic factors, environmental factors like intrauterine infections such as rubella, cytomegalovirus syphilis etc. This highlights the importance of Immunization against rubella and now vaccination is routine in some countries which bound to some reduction in congenital abnormalities [5].

Rubella Vaccination

Active immunization against rubella is now possible with live attenuated vaccines. The goal of rubella vaccine immunization is the prevention of rubella infection during a future pregnancy [5]. Rubella vaccine is available combined with measles and mumps vaccines as MMR, or combined with mumps, measles, and varicella vaccine as MMRV (ProQuad). The RA 27/3 rubella vaccine is a live attenuated virus. It was first isolated in 1965 at the Wistar Institute from a rubella-infected aborted fetus. Rubella vaccine is available combined with measles and mumps vaccines as MMR, or combined with mumps, measles, and varicella vaccine as MMRV [1].

Rubella vaccine is highly effective and has resulted in elimination of rubella and CRS from the western hemisphere and several European countries. Review of several studies documents the duration of protection over 10-21 years following one dose of RA27/3 vaccination, and persistent sero positivity in over 95% cases. Studies in India show sero negativity to rubella among adolescent girls to vary from 10% to 36%. Although due to early age of infection resulting in protection in the reproductive age group, incidence of rubella in India is not very high. However, due to severity of CRS coupled with introduction of Rubella Contatining Vaccine (RCV) in some of the states likely lead to sub-optimal coverage and resulting higher risk of rubella during pregnancy in the coming decades, it is mandatory to adopt the goal of rubella elimination. Moreover to control measles, the country has adopted strategy of delivering second dose of measles through measles campaigns covering children 9 months to 10 years of age in 14 states and elimination can achieved by replacing measles vaccine by MMR vaccine. Other states which are to give second dose of measles through routine immunization will also have to adopt campaign, in order to eliminate rubella from the country over 10-20 years. Subsequently, measles vaccine can be replaced by MR or MMR vaccine in the national schedule [3].

The Indian Academy of Pediatrics (IAP) recommends a dose of measles-mumps-rubella vaccine (MMR) at 15-18 months of age, fulfilling the need for a second dose of measles vaccine [10].

Considering the severity of CRS and availability of affordable, acceptable, safe and effective vaccine to prevent it, most of the European countries like Denmark, Sweden and United States have included two doses of rubella in their immunization schedule. In these countries first dose of Measles, Mumps and Rubella (MMR) vaccine is given at 15-18 months of age followed by second dose at 12-14 years of age as MMR vaccine or rubella vaccine exclusively for girls. WHO recommended introduction of rubella-containing vaccines in immunization program of countries that have not yet introduced it. This can be achieved b y booster dose of vaccination at school age or adolescence [11]. 10-30% of adolescent females and 12-30% of women in the reproductive age-group are susceptible to rubella infection in India. RCVs are highly immunogenic in Indian adolescents and women. The coverage data of RCVs in India is not available. However, the coverage of MMR vaccine has been reported as 42%, 30% and 5% from Delhi, Chandigarh and Goa, respectively [2].

Vaccines for measles, mumps, rubella (MMR)

vaccine, should be given a month or more before pregnancy. Rubella infection in pregnant women can cause unborn babies with serious birth defects or even die before birth. Pre-pregnancy blood test is recommended to identify whether the person is immune to the disease. After getting vaccinated, avoid becoming pregnant until one month and ideally not until immunity is confirmed by a blood test [7].

Global Measles Rubella Strategic Plan 2012-2020

This plan is first attained in Cuba. As per WHO 2020, Rubella should be prevented along with measles and associated congenital anomalies like congenital rubella syndrome. To eradicate rubella, death due to rubella should be reduced to 95%.

This Strategic Plan 2012–2020 explains how countries, working together with the MR Initiative to achieve a world without measles, rubella and CRS. The Plan builds on the experience and successes of a decade of accelerated measles control efforts that resulted in a 74% reduction in measles deaths globally between 2000 and 2010. It integrates the newest 2011 World Health Organization policy on rubella vaccination which recommends combining measles and rubella control strategies and widespread use of combined measles-rubella vaccine formulations, i.e. measles-rubella (MR) and measles-mumps-rubella (MMR). The strategy focuses on the implementation of five core components.

1. Achieve and maintain high levels of population immunity by providing high vaccination coverage with two doses of measles- and rubella-containing vaccines.
2. Monitor disease using effective surveillance, and evaluate programmatic efforts to ensure progress.
3. Develop and maintain outbreak preparedness, respond rapidly to outbreaks and manage cases.
4. Communicate and engage to build public confidence and demand for immunization.
5. Perform the research and development needed to support cost-effective operations and improve vaccination and diagnostic tools.

This also provides the global context and an assessment of the current state of the world with respect to national, regional and global management of measles and rubella. In addition to this, it outlines guiding principles that provide a foundation for all measles and rubella control efforts, including country ownership, strengthening routine immunization and health systems, ensuring linkages with other health interventions and equity in immunization by reaching every child. It also examines key challenges to measles and rubella control and elimination, including financial risks, high population density and highly mobile populations, weak immunization systems and inaccurate reporting of vaccination coverage. More than that, it also offers solutions to these challenges, discusses the roles and responsibilities of stakeholders, and provides indicators to monitor and evaluate national, regional and global progress towards the vision and goals. Countries bear the largest responsibility for measles and rubella control and elimination, and they must support sustainable national planning, funding and advocacy to protect their citizens from devastating preventable disease [8].

KERALA; State-Level Initiative to Prevent Childhood Disabilities

In kerala, the Departments of Health and Social Welfare launched the vaccination as part of a larger initiative to prevent childhood disabilities. The Health Department implemented rubella vaccination in a campaign mode, targeting girls from classes VIII to XII. Alongside, the second dose of measles vaccine, currently administered to infants at 18 months as part of routine immunisation, will be replaced by the MMR (mumps-measles-rubella) vaccine, so that all children are protected against measles and rubella.

The programme is being implemented by utilising the funds provided by the Social Justice Department under its mega initiative, State Initiative on Disabilities (SID), to detect disabilities in children at an early stage for appropriate interventions.

The strategy of the World Health Organisation for the elimination of measles and rubella says that all infants be administered the MMR vaccine, while special precaution be taken to ensure that all girls in the post-pubertal or marriageable age (who might not have received MMR vaccine in infancy) are protected by a dose of monovalent rubella vaccine [9].

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Author Affiliation:
*Director, Professor and Head, **Senior Resident, ***Professor, ****Junior Resident, Department of Community Medicine, Maulana Azad Medical College, New Delhi.

Reprint Request:
Suneela Garg,
Director, Professor and Head Sub Dean, Department of Community Medicine, Maulana Azad Medical College, 2, Bahadur Shah Zafar Marg, New Delhi, Delhi 110002.
E-mail: gargsuneela@gmail.com

Strategies to Combat Congenital Rubella Syndrome: An Overview

Suneela Garg*, Archana Ramalingam, M.M. Singh***, Sriram T.*****

Abstract

Congenital Rubella Syndrome affects nearly 110000 infants every year and is one of the most important preventable causes of congenital anomalies in children. The Measles Rubella Initiative along with its partners has chalked out a Global Strategic Plan to combat rubella along with measles and aims to eliminate both the diseases by 2020 in at least five WHO Regions. India is also committed to eliminating Rubella by 2020 and has laid down steps to combat this disease.

Keywords: Congenital Rubella Syndrome; Rubella-Containing Vaccines (RCV); Measles and Rubella (MR); Measles; Mumps and Rubella (MMR).

Introduction

Rubella is a viral exanthematous self-limiting illness caused by an RNA virus of the Togaviridae family [1]. However, when the virus affects a pregnant woman, then it leads to a transplacental infection of the foetus which results in a conglomeration of defects in the newborn referred to as Congenital Rubella Syndrome (CRS) [2]. CRS results in an array of defects of the eyes, ear, heart and other organs resulting in morbidity and disability that would require costly therapy and lifelong care [3]. In the year 2008, it was found that 110000 infants were affected by CRS and nearly 48% of them were from South East Asian region, and another 38% were from the African region [4].

The exact estimate of the burden of CRS in India is not available. Dewan P et al. did a systematic review of Congenital Rubella Syndrome and found that most of the data available were from hospital-based studies and community-based data was lacking [5]. Few serosurveys to check for the levels of rubella antibody have been done in different parts of India. Ramamurthy et al. did a study among boys and girls of Tamil Nadu and found seronegativity of 82.2% among the children of 1-5 years and 13.2% of the adolescent boys and girls (10-16 years) [6]. Sharma et al. studied the serostatus for rubella in two public schools in Jammu among school girls aged 11-18 years and found 32.7% seronegativity among them [7]. Vijayalakshmi et al. did serosurveys in three cities of Tamil Nadu and found seronegativity ranging from 11.7-20.8% [8].

Why Focus on Rubella Elimination?

Though rubella is a self-limiting disease in children, the real problem occurs when the disease affects pregnant women. Congenital Rubella Syndrome is one of the most common causes of avoidable congenital anomalies in infants, as effective vaccines are available to prevent rubella infections [4]. Rubella vaccines could be monovalent or in combination with other vaccine viruses called Rubella-containing vaccines (RCV) like Measles and Rubella (MR), Measles, Mumps and Rubella (MMR), etc. Most of the Rubella vaccines use a live attenuated strain RA 27/3 [9]. All licenced serovaccines for Rubella cause a 95% seroconversion rate after administration of a single dose and the protection lasts for 10-21 years [10].

Strategic Advisory Group of Experts on Immunisation (SAGE) Recommendations for Rubella Vaccine

The SAGE reported that as of 2011, 63 of the 194 WHO member states had not introduced rubella-containing vaccine into their routine immunisation schedule. SAGE had indicated that there were two approaches to introducing rubella containing vaccines. One is to vaccinate all adolescent girls/

women of childbearing age with RCV. This would prevent congenital rubella syndrome but will not reduce the transmission of rubella infection. The other approach is to introduce the vaccine into the childhood immunisation schedule replacing the two doses of measles-containing vaccine with MR or MMR. But before this is done a wide age range campaign with rubella-containing vaccine should be done and then MR/ MMR should be introduced within six months. This strategy, in the long run, would help in the elimination of measles. But care should be taken to ensure that the coverage of RCVs should be at least 80% or else there would be an age shift in the epidemiology of rubella resulting in an increase in rubella infection among adults and thereby increasing the incidence of CRS. Each country should carefully look into the epidemiology and burden of rubella and CRS, financial resources and surveillance mechanisms before introducing RCVs [11].

Global Measles and Rubella Strategic Plan 2012-2020

The Global Measles and Rubella Strategic Plan is based on the thinking that rubella control efforts must be coupled with that of measles because of the success of the accelerated measles control strategies that were able to reduce measles mortality by 74% of the 2000 estimates in the year 2010.The goal of the Strategic Plan is to achieve measles and rubella elimination in five WHO Regions by the year 2020. The five pronged strategy laid done to achieve this goal included maintaining a high level of population immunity by maintaining high coverage of RCVs, establishing surveillance systems to monitor disease and control measures, efficient outbreak preparedness, engaging the community and research and development for newer vaccines and diagnostic tools [12].

Steps Taken by Ministry of Health and Family Welfare Government of India for Rubella Elimination

India has committed itself to the elimination of Measles and Rubella by the year 2020 in the 66th SEARO regional committee meeting held in New Delhi in 2013. To achieve this, India has included evaluation of rubella antigen and introduction of rubella-containing vaccine as one of the key expected results of the Multi-Year Strategic Plan 2013-17 for Universal Immunisation Programme. The strategies proposed in the plan are to a) establish and expand the surveillance network for Congenital Rubella Syndrome, b) establishment of a Measles- Rubella India Expert Advisory Group (MRIEAG) which would chalk out the plan for introduction of Rubella and monitor progress of control strategies and c) to conduct research on trends of Rubella and CRS [13].

Conclusion

Congenital Rubella Syndrome is an important cause of preventable congenital anomalies among infants. Globally the threat due to CRS is recognised and goals and strategies have been devised to address this problem. India too is committed to resolving this issue. However, we have a long journey ahead with many roadblocks like low coverage rates of routine immunisation, high population density, high levels of migration, misconceptions about vaccinations,etc. that need to be addressed before we achieve the goal of elimination of Rubella and CRS.

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Evaluating and Treating People Living with HIV/AIDS: What does Physical Therapists' Attitudes Say?

Senthil P. Kumar*, Asir John Samuel**

Author Affiliation:
*Professor and Principal, **Assistant Professor, Maharishi Markandeshwar Institute of Physiotherapy and Rehabilitation (MMIPR), Maharishi Markandeshwar University (MMU), Mullana-Ambala-133207, Haryana, India.

Reprint Request:
Senthil P. Kumar,
*Professor and Principal, Maharishi Markandeshwar Institute of Physiotherapy and Rehabilitation (MMIPR), Maharishi Markandeshwar University (MMU), Mullana-Ambala-133207, Haryana, India.
E-mail: senthil.p.kumar@mmumullana.org

Abstract

Healthcare professionals' attitudes determine their knowledge and behavior towards evaluation and treatment of people living with Acquired Immunodeficiency Syndrome (AIDS). Physiotherapists (PTs) are an essential part of a multidisciplinary rehabilitation team to provide holistic care for people with AIDS (PLWA) targeting along a symptom control- quality of life continuum. This short report summarized the findings from research studies on attitudes of PTs towards PLWA from an evidence-informed perspective through a preliminary search of PubMed database.

Keywords: AIDS; Physiotherapists; PLWA.

Introduction

Adequate knowledge, positive attitude, and willingness to provide services are important factors in rendering competent and compassionate care to patients living with Acquired Immunodeficiency Syndrome (AIDS). Physiotherapists (PTs) are an essential part of a multidisciplinary rehabilitation team to provide holistic care for people with AIDS (PLWA) targeting along a symptom control- quality of life continuum.

This short report aimed to summarize the findings from research studies on attitudes of PTs towards PLWA from an evidence-informed perspective through a preliminary search of PubMed database.

Main Findings

Assessment of Attitudes

Students

Oyeyemi et al [1] investigated 104 Nigerian physiotherapy students' knowledge, attitude, and their willingness to provide care for PLWA to determine the sociodemographic variables that could influence the students' attitude and willingness to provide care for PLWA. The students had poor knowledge, negative attitude with care-related unwillingness. Religious affiliation, training programs, long-term career goals, and previous instructions on AIDS were found to influence the students' attitude.

Professionals

Oyeyemi et al [2] studied the 131 practising Nigerian physiotherapists' knowledge, attitude and willingness to provide care for patients living with AIDS (PLWA), and also determined the relationship between socio-demographic variables and previous encounter with PLWA, and physiotherapists' knowledge, attitude and willingness to care for AIDS survivors. The study found that physiotherapists showed inadequate knowledge about AIDS, with negative attitude towards PLWA, and unwillingness to provide care for PLWA.

Treatment of Attitudes

Held [3] compared the effect of an education unit versus control group delayed-intervention on 103 entry-level undergraduate junior physical therapy students' knowledge about acquired immunodeficiency syndrome (AIDS), their attitudes toward patients with AIDS, and their willingness to treat patients who have AIDS. The experimental group was found to improve their knowledge, attitudes, and willingness to treat patients who have AIDS as a result of the AIDS education unit.

Discussion

Our short report found only limited number of studies on this context and this insufficient evidence together with limited focus on such an important healthcare issue is an urgent need from a public health perspective in India. Inadequate knowledge and poor attitude could exclude the application of the principles of logic and scientific methods to the practice of physiotherapy, and could result in fragmented care, with a potentially negative impact on treatment outcome and patient satisfaction.

The studies and their findings warrant a comprehensive AIDS education interventions targeting interprofessional education in order to address the knowledge deficits and negative attitudes which may lead to stereotyping behavior and bias against PLWA.

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[1] Flink H, Tegelberg Å, Thörn M, Lagerlöf F. Effect of oral iron supplementation on unstimulated salivary flow rate: A randomized, double-blind, placebo-controlled trial. J Oral Pathol Med 2006; 35: 540-7.

[2] Twetman S, Axelsson S, Dahlgren H, Holm AK, Källestål C, Lagerlöf F, et al. Caries-preventive effect of fluoride toothpaste: A systematic review. Acta Odontol Scand 2003; 61: 347-55.

Article in supplement or special issue

[3] Fleischer W, Reimer K. Povidone iodine antisepsis. State of the art. Dermatology 1997; 195 Suppl 2: 3-9.

Corporate (collective) author

[4] American Academy of Periodontology. Sonic and ultrasonic scalers in periodontics. J Periodontol 2000; 71: 1792-801.

Unpublished article

[5] Garoushi S, Lassila LV, Tezvergil A, Vallittu PK. Static and fatigue compression test for particulate filler composite resin with fiber-reinforced composite substructure. Dent Mater 2006.

Personal author(s)

[6] Hosmer D, Lemeshow S. Applied logistic regression, 2nd edn. New York: Wiley-Interscience; 2000.

Chapter in book

[7] Nauntofte B, Tenovuo J, Lagerlöf F. Secretion and composition of saliva. In: Fejerskov O, Kidd EAM,

editors. Dental caries: The disease and its clinical management. Oxford: Blackwell Munksgaard; 2003. p. 7-27.

No author given

[8] World Health Organization. Oral health surveys - basic methods, 4th edn. Geneva: World Health Organization; 1997.

Reference from electronic media

[9] National Statistics Online—Trends in suicide by method in England and Wales, 1979-2001. www.statistics.gov.uk/downloads/theme_health/HSQ 20.pdf (accessed Jan 24, 2005): 7-18. Only verified references against the original documents should be cited. Authors are responsible for the accuracy and completeness of their references and for correct text citation. The number of reference should be kept limited to 20 in case of major communications and 10 for short communications.

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