ISSN: 0975-833X

Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 10, Issue, 03, pp.66945-66948, March, 2018

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

RESEARCH ARTICLE

EPIDEMIOLOGICAL STUDY OF MEASLES OUTBREAK WITH LABORATORY DIAGNOSIS IN BIHAR

1Ranjan Kumar Srivastava, *2Naveen Kumar Raman and 3 Navnit Kumar Dutta

[1]Asscoiate Professor, Department of Microbiology, Patna Medical College, Patna, India
[2]District Microbiologist, IDSP, Department of Microbiology, Patna Medical College, Patna, India
[3]State Microbiologist, IDSP, Department of Microbiology, Patna Medical College, Patna, India

ARTICLE INFO

Article History:
Received 21st December, 2017
Received in revised form
22nd January, 2018
Accepted 04th February, 2018
Published online 30th March, 2018

Key words:
Microbiology.

ABSTRACT

Rupture of Measles is highly contagious diseases. It is caused by paramyxovirus, with a secondary attack rate in excess of 80% that usually affects children. WHO (World Health organisation) with NPSP (National Polio Surveillance Project) and Measles Elimination and Rubella Control Programme is working rapidly in the field of measles elimination in the Bihar. Government of Bihar with IDSP (Integrated Disease Surveillance Programme) is also involved in the measles immunization and surveillance.

Objective:- The purpose of the study is to study the epidemiology of measles in the Bihar during January 2016 to December 2016.

Material and Methods:-Study was carried out between Jan-2016 to Dec- 2016 on the data of WHO-NPSP Measles and Rubella Elimination Programme. Department of Microbiology, Patna Medical College, Patna has WHO accredited Lab for Measles and Rubella Testing. WHO case definition is used to define measles cases / outbreak.

Conclusion: -The finding highlighted proper surveillance and routine immunization of measles in Bihar.

Citation: Ranjan Kumar Srivastava, Naveen Kumar Raman and Navnit Kumar Dutta, 2018. "epidemiological study of measles outbreak with laboratory diagnosis in Bihar", *International Journal of Current Research*, 10, (02), 66945-66948.

INTRODUCTION

Measles is highly contagious viral diseases. It remains an important cause of death among young children globally, despite the availability of a safe and effective vaccine. Measles is transmitted via droplets from the house, mouth or throat of infected person symptom include blood shot eyes, a runny nose, high fever, tiny white spots on the inside of the mouth after 10-12 days. Severe measles is more likely among poor nourished young children, especially those with insufficient Vitamin A, or who has weak immune system by HIV/AIDS. Globally measles deaths have decreased by 84% worldwide in recent years from 550,100 deaths in 2000 to 89780 in 2016, while measles is common in many developing countries, particularly in Asia and Africa. The measles vaccine has been in use in since $1960_{s.}$ But it is expensive. In India estimated 92000 deaths occurred in India due to measles, predominantly in children aged less than 5 years in 2005. WHO-SEAR (South East Asia Region) has launched "Measles Elimination and Rubella / Congenital Rubella Syndrome Control from 2014 to 2020.

Corresponding author: **Naveen Kumar Raman,**
District Microbiologist, IDSP, Department of Microbiology, Patna Medical College, Patna, India.

Presently in Bihar, government with many other organizations are involved in measles immunization on routine basis.

MATERIALS AND METHODS

This study is carried out on the data of WHO-NPSP Measles Elimination and Rubella Control Programme running since 2011 in Bihar. This study was carried out from 01-01-2016 to 31-12-2016. All the outbreaks, lab tests are carried out according to WHO guidelines. All the ELISA IgM tests of measles and rubella are performed at WHO accredited lab of Department of Microbiology, Patna Medical College, Patna. Outbreak is identified by the WHO-SMO (Surveillance Medical Officer), DIO (District Immunization Officer), Block Medical Officer, IDSP personals-Epidemiologist, etc in the districts. The Symptoms include blood shot eyes, runny nose, high fever, tiny white spots on the mouth etc. According to census-2012, Bihar has total population of 99 millions. It has 38 districts with 99,200 km^2 land area. Clinical measles outbreaks are decided by the ERT when

>= 05 clinical cases of measles in block area
or
Any measles associated death in block in a week
or

>= 05 clinical cases in an area bordering more than one adjacent block

This project is running by Epidemic Response Team (EPI) with IDSP Rapid Response Team (RRT). ERT team has District Immunization Officer, Block Medical Officer, Surveillance Medical Officer of WHO-NPSP, Hospital Clinician, Paramedical Staffs, NGOs representatives etc. ERT has the different responsibilities like- Plan the control and response in the light of overall surveillance / outbreak investigation. Health workers visited home to home in their respected area. Search the measles patients with primary symptoms and noted down. Now the ERT identified at least five cases of measles and collected the blood samples after the incubation period according to WHO guidelines. Now the samples are send to WHO accredited measles and rubella Lab of Patna Medical College, Patna for ELISA IgM test with proper transport procedure maintaining with cold chain. The clinical outbreak is identified by at least three samples positive in the five samples. Measles equivocal and negative samples are tested for Rubella IgM test by ELISA. The epidemiology linked cases were analysed separately and where related to outbreak like year and the location of outbreaks, number of cases, number of samples positive for measles with sex wise, age wise, vaccination status etc.

RESULTS

The total number of outbreaks reported 201 in the year 2016 from January to December in the Bihar. Total numbers of samples received in the laboratory are 1075. ELISA IgM test has been performed of 1075 samples. In the 1075 samples 428 samples are found measles positive (39.81%) . 610 samples are found for measles negative. 37 samples are found measles equivocal. 610 negative and 37 equivocal, total 647 samples are tested for rubella.73 samples are found positive for rubella in 647 negative and equivocal samples of measles. Total 569 samples are found rubella negative and 05 are rubella equivocal.

District Wise Distribution

Bihar has total 38 districts .But measles outbreaks has became in total 31 districts. A total of 201 outbreaks have happened in 31 districts. Arwal, Aurangabad, Banka, Jamui, Jehanabad, Kaimur and Munger have no outbreak cases in 2016. East Champaran, West Champaran, Araia, Katihar, Nawada, Sitamarhi, Supaul are mostly affected districts. While Rohtas, Bhojpur, Gaya, Seikhpura, Madhubani are less effective.

Seasonal Distribution

In the month of January, February and March 2106 cases of measles increases in comparison with July, September and October of 2016 (Table-1).

Age/Sex wise distribution

In total 428 positive cases <5 years of age were 241 (56.3 %). While 187 (43.6 %) were >5 years (Table-3). Total Males were identified 218 (50.9 %). While female were identified 210 (49 %) in 428 positive cases. 83 patients were vaccinated in total 1042 cases. In which 24 cases were found positive after vaccination. Total male samples are collected 471 and female samples are collected 604 in the year 2016 in total 1075 samples (Table-2).

Month wise distribution of Measles Cases in 2016

Table 1. Month wise distribution of measles cases in 2016

Month	No. of Sample tested in 2016	Measles Positive in 2016
Jan	215	108
Feb	286	122
Mar	235	68
Apr	110	22
May	47	12
Jun	50	13
July	23	6
Aug	15	11
Sep	10	8
Oct	16	10
Nov	27	24
Dec	41	24
Total	1075	428

Table 2. Sex wise distribution of measles cases in 2016

Total sample	Sample Tested	Measles Positive
Male	471	218
Female	604	210
Total	1075	428
Sex wise distribution of Measles Cases in 2016		

Table 3. Age wise distribution of measles cases in 2016

Measles Positive 2016 less than 5yrs & greater than 5yrs	
<5 years	241
>5years	187
Total	428

DISCUSSION AND CONCLUSION

In 38 districts of Bihar 31 districts have measles positive cases in 2016. East Champaran, West Champaran, Araria , Katihar, Nawada, Sitamrhi, Suapul showed many outbreaks. 20 outbreaks have been identified in Purnia in 2016. In which 106 samples have been tested, but only 06 samples were measles positive. Rohtas, Bhojpur, Gaya, Seikhpura, Madhubani have few outbreaks and positive cases in the comparison with above districts (Table-4).

Lack of hygiene, overcrowding, malnutrition, increases the risk of measles transmission. In the year 2013, 2014, 2015 measles outbreaks cases were very less in Bihar comparison with 2016. It shows that State has not proper immunization programmes of measles. It indicates the poor surveillance system for measles. Winter season November, December, January, February, show the highly positive cases, while in summer and rainy season are less positive. Vaccinated 83 ceases have been also showed the 24 positive cases. That indicates the poor quality of vaccination/immunization somewhere. WHO with Govt. of India have been fixed the target to eliminate measles by 2020 in India. It can be possible by taking better steps in outbreaks investigations like- Identifying the measles outbreaks that need to be investigated and assigning an outbreak number, Mobilization of Epidemic Response Team (ERT), Orientation and Planning meeting at the local level, Conducting measles cases search, Collection and Shipment of specimens to the Laboratory, Laboratory confirmation of the outbreak as soon as

Table 4. Distribution of measles outbreak/Positive case with district wise form jan-2016 to Dec-2016

.N	Districts	Outbreak	No. of Sample Received	No. of Measles Positive
1	Araria	5	35	25
2	Arwal	0	0	0
3	Aurangabad	0	0	0
4	Banka	0	0	0
5	Begusarai	1	5	4
6	Bhagalpur	1	6	6
7	Bhojpur	1	1	1
8	Buxar	5	20	4
9	Darbhanga	1	5	0
10	East Champaran	30	157	38
11	Gaya	1	5	4
12	Gopalganj	11	55	13
13	Jamui	0	0	0
14	Jehanabad	0	0	0
15	Khagaria	5	24	7
16	Kishanganj	1	6	5
17	Kaimur	0	0	0
18	Katihar	15	76	26
19	Lakhisarai	1	6	6
20	Madhubani	2	10	3
21	Munger	0	0	0
22	Madhepura	3	17	15
23	Muzaffarpur	3	18	11
24	Nalanda	2	10	4
25	Nawada	11	61	49
26	Patna	1	5	5
27	Purnia	20	106	6
28	Rohtas	2	10	3
29	Saharsa	5	28	21
30	Samastipur	1	6	0
31	Sheohar	1	4	4
32	Sheikhpura	1	5	2
33	Saran	5	30	19
34	Sitamarhi	12	76	51
35	Supaul	9	56	38
36	Siwan	1	5	0
37	Vaishali	6	36	19
38	West Champaran	38	191	39
Total		201	1075	428

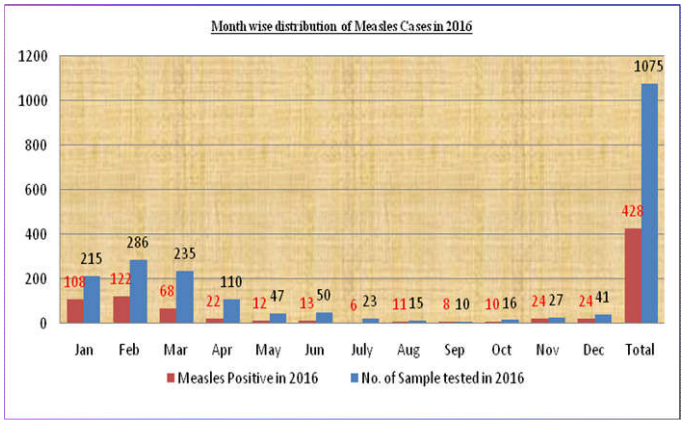

Figure 1. Month wise distribution of measles in 2016

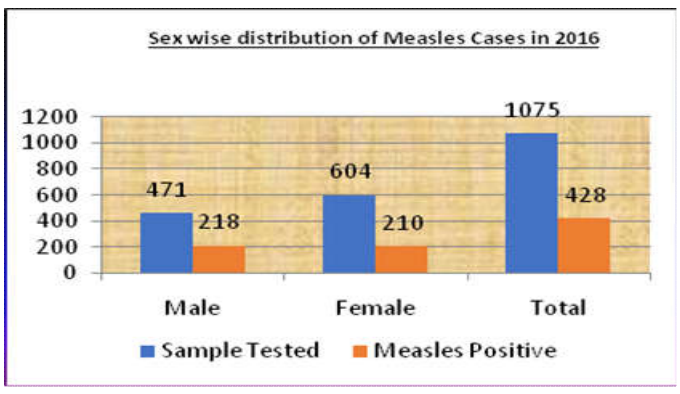

Figure 2. Sex wise distribution of measles in 2016

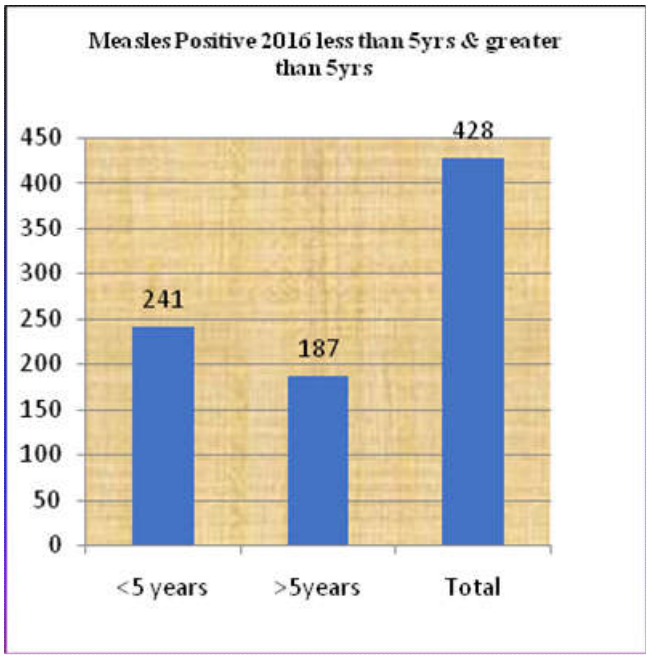

Figure 3. Age wise distribution of measles in 2016

possible, Data analysis, Conversion of data to information for action, Report writing, Giving feedback, Initiating actions , Proper Immunization in the community with good and maintained quality of vaccines, Awareness in the community about measles, Better health action plan with good quality of

treatment in hospitals etc. The Co-authors Dr. Ranjan Kumar Srivastava and Navnit Kumar Dutta have important role in the WHO accredited Measles and Rubella lab of Patna Medical College Patna.

Acknowledgement

The authors are thankful to Dr.S.N Singh, Prof. and Head of Department of Microbiology, PMC, Patna. Dr.Umesh Sharma, EX-Prof. and Head of Department of Microbiology,PMC, Patna. Dr.Vijay Kumar, Associate Professor, Department of Microbiology, PMC, Patna and Dr. Lucky Sangal, Laboratory Focal Person for NPSP-Measles Elimination and Rubella Control Programme of WHO country office India, New Delhi for their valuable support.

REFERENCES

Alya Dabbagh, Minal K. Patel, Laure Dumolard, Marta Gacic-Dobo, Mick N. Mulders, Jean-Marie Okwo-Bele, Katrina Kretsinger, Mark J. Papania and Paul A. 2017. Rota, James L. Goodson. Progress Toward Regional Measles Elimination — Worldwide, 2000–2016US Department of Health and Human Services/Centers for Disease Control and Prevention, MMWR / October 27/ Vol.66/No.42.

Babita, Sanjeev Suman, Shankar Prakash, 2013. Epidemiological Study of Measles in Bihar, *Journal of Evolution of Medical and Dental Sciences*, Volume 2/ Issue 26/ July 1.

Government of India Department of Family Welfare, New Delhi, Field Guide, Measles Surveillance and Outbreak Investigation, November 2005.http://www.searo.who.int/india/topics/measles/Measles_surveillance_and_outbreak_investigation_field_guide_2005.pdf.

Henri Vanden Hombergh, Edward Hoekstra, Sufia Askari and Kansal, O.P. 2009. Measles Vaccination Response During Kosi Floods,Bihar, India, 2008 *Indian Pediatrics*, Volume 46 November 17.

Immunization, Vaccines and Biologicals, http://www.who.int/immunization/diseases/measles/en/,http://www.who.int/immunization/diseases/measles/global_coordination/en/index3.html.

India's measles-rubella vaccination campaign a big step towards reducing childhood mortality, addressing birth defects, Dr Poonam Khetrapal Singh, WHO Regional Director for South-East Asia, http://www.searo.who.int/mediacentre/features/2017/india-measles-rubella-vaccination-campaign/en/

Manoj V. Murhekar, Mohammad Ahmad, Hemant Shukla, Kunwar Abhishek, Robert T. Perry, Anindya S. Bose, Rahul Shimpi, Arun Kumar, Kanagasabai Kaliaperumal, Raman Sethi, Vadivoo Selvaraj, Pattabi Kamaraj, Satyabrata Routray, Vidya Nand Das, Nata Menabde and Sunil Bahl. 2014.Measles Case Fatality Rate in Bihar, India, 2011–12,https://doi.org/10.1371/journal.pone.0096668, May 13,

Measles - Rubella Surveillance and Outbreak Investigation, 2009 Guidelines, **ISBN**: 9789290223504, http://www.searo.who.int/immunization/documents/9789290223504/en/

Murhekar, MV., Ahmad, M,, Shukla, H., Abhishek, K., Perry RT. et al. 2014. Measles Case Fatality Rate in Bihar, India, 2011–12. *PLoS ONE,* 9(5): e96668.doi:10.1371/journal.pone .0096668,May 13, 2014

Park's Text Book of Preventive and Social Medicine, 23rd Edition, 2015.

Sherin Varkey, Gopal Krishna, Narottam Pradhan, Satish Kumar Gupta, Jorge Caravotta,

Strategic Plan for Measles Elimination and Rubella and Congenital Rubella Syndrome Control in the South-East Asia Region 2014–2020, World Health Organization, Regional office for South-East Asia,N.Delhi,2015. http://www.searo.who.int/immunization/documents/sear_mr_strategic_plan_2014_2020.pdf.

Sudipta Basa, Rashmi Ranjan Das, (Late) and Javed Akhtar Khan, 2015. Root-Cause Analytical Survey for Measles Outbreak: Vaccination or Vaccine?- A Study From Madhepura District, Bihar, *India Journal of Clinical and Diagnostic Research,* Jun, Vol-9(6): SC04-SC07.

Sunil R Vaidya, 2015. Commitment of Measles Elimination by 2020: Callenges in India, *Indian Pediatr.,* 52: 103-106

****