RESEARCH ARTICLE

PROMOTING INFLUENZA VACCINATION: INSIGHTS FROM INFLUENZA (H1N1) OUTBREAK IN JHARKHAND

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Manuscript Info

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Abstract

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Background and Objectives: Influenza virus is a typical human pathogen causing serious respiratory illness resulting in significant mortality. In the recent years, increase in number of confirmed cases of influenza virus infection has occurred in different districts of Jharkhand. Pandemic influenza A (H1N1) 2009 virus emerged in 2009 and caused pandemic with high morbidity and mortality in India and worldwide. In Jharkhand, influenza virus infection remains an important health issue, since vaccination is not universal.

Aim & objective: The study was conducted at Virus Research and Diagnostic Laboratory (VRDL), Department of Microbiology, Rajendra Institute of Medical Sciences, Ranchi, Jharkhand, during January 2019- February 2020.

Materials and Methods: Samples of clinically suspected cases of influenza-like illness received in the Virus Research and Diagnostic Laboratory, Department of Microbiology, RIMS, Ranchi, from January 2019 to February 2020 were included in the study.

Results: During the study period, a total of 150 samples from clinically suspected cases of influenza like illness belonging to Category C as per case definition were received for testing. Of these 150 samples, 23 samples tested positive for influenza A. Of total suspected cases (150), 58 were females and 92 were males.

Conclusion: Active surveillance is required from time to time to timely diagnose the disease and manage the complications and take necessary steps to control them.

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Introduction:-

H1N1 Swine flu is a subtype of influenza A virus (a communicable viral disease), which causes upper, and potentially, lower respiratory tract infections in the host it infects, resulting in symptoms such as nasal secretions, chills, fever, decreased appetite, and possibly lower respiratory tract disease. H1N1 swine influenza is a common infection in pigs worldwide, and that is why it is also known as swine flu. H1N1 swine flu leads to respiratory disease that can potentially infect the respiratory tract of pigs. Sometimes, people who are closely associated with pigs or in the proximity of pigs have developed swine flu (zoonotic swine flu). Swine influenza viruses can potentially cause infections in humans if antigenic characteristics of the virus change through reassortment. When

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this happens, transmission from person-to-person is usually inefficient. Influenza A pandemics such as the ones in 1918 and 2009 can occur if the transmission from person-to-person becomes efficient. (1)

Influenza virus is a typical human pathogen causing serious respiratory illness, resulting in high mortality throughout the globe. It can cause widespread pandemics as it spreads easily from person to person.(2) . Outbreaks of various viral agents are common in India. Timely diagnosis of these outbreaks is critical to mount appropriate public health response. The inadequacy of specialised virology laboratories in the country was noticed in the past as well as during the recent 2009 H1N1 pandemic.(3)

Our main objectives of this study was to detect H1N1 cases from samples of clinically suspected cases of influenza-like illness received in the Virus Research and Diagnostic Laboratory, Department of Microbiology, RIMS, Ranchi, from January 2019 to February 2020 .

Material & Methods:-
The study was conducted at Virus Research and Diagnostic Laboratory (VRDL), Department of Microbiology, Rajendra Institute of Medical Sciences, Ranchi, Jharkhand ,during January 2019- February 2020. Clinically, suspected cases belonging to Category C as per the Ministry of Health and Family Welfare guidelines on the categorisation of H1N1 cases(4) were included in the study. Throat swabs and nasal swabs/nasopharyngeal swabs were collected by clinician in the viral transport medium and transported to VRDL, RIMS, Ranchi. Samples were confirmed positive by sending the samples to National Institute of Cholera and Enteric Diseases, (NICED) Kolkata. Cold chain was maintained for the samples received from distant places and also sent for confirmation to NICED, Kolkata . Total number of samples processed during the study period was 150.

RNA Extraction and Real-Time polymerase chain reaction (RT-PCR) testing of samples were conducted for influenza type A and influenza A H1N1 pdm09.

Patients were divided into four age groups for the analysis of the results. Age Group I, Group II, Group III and Group IV comprising ≤5years, 6–18 years, 19–59 years and ≥60 years respectively.

Results:-
During the study period, a total of 150 samples from clinically suspected cases of influenza like illness belonging to Category C as per case definition were received for testing. Of these 150 samples, 23 samples (15.33%) tested positive for influenza A subtype. Distribution of positive samples among the four age groups is presented in Table 1.

Table 1:- Age -wise distribution of influenza- positive cases.

Age group	Total cases tested	Total Influenza A(H1N1)positive cases
Group I ≤5 yrs.	16	0
Group II 6–18 yrs.	16	6
Group III 19–59 yrs.	94	11
Group IV >=60 yrs.	24	6

Maximum number of suspected cases was in Group III, followed by Group IV , Group I and Group II and Group I in the descending order. The highest number of positive cases belonged to age Group III, followed by Group IV and Group II in descending order. There was no positive case in Group I .

Table 2:- Gender-wise distribution of influenza-positive cases:

Gender	Total cases tested	Total Influenza A(H1N1)positive cases
Male	92	14
Female	58	9

Of total suspected cases(150), 92 were male and 58 were female. Of a total of 23 positive cases, 14 (60.86%)were male and 9 (39.13%)were female.

Table 3:- Clinical presentation of positive cases.

Symptoms	Number of cases
Fever	23
Cough	21
Sore throat	17
Nasal discharge	12
Breathlessness	10
Bodyache	10
Headache	8
Nausea/vomiting	8
Myalgia	7
Chest pain	3
Abdominal pain	2
Diarrhoea	2
Ear discharge	1

Majority of the positive cases had the clinical manifestations of fever, cough , sore throat , nasal discharge, breathlessness, bodyache, headache ,nausea/vomiting ,myalgia, followed by chest pain, abdominal pain, diarrhoea and ear discharge in decreasing order which was common among all influenza-positive cases. The data of clinical manifestations are given in Table 3.

Table 4:- Distribution of positive cases in various districts of Jharkhand.

District	Number of cases
Ranchi	13
Jamshedpur	3
Simdega	3
Ramgarh	1
Dhanbad	1
Chatra	1
Daltenganj	1

We received samples from 5 districts of Jharkhand, which is depicted in Table 4. Ranchi was the most affected district, followed by Jamshedpur, Simdega, Ramgarh, Dhanbad, Chatra and Daltenganj districts with equal number of cases.

Figure 1:- Month-wise distribution of influenza positive cases.
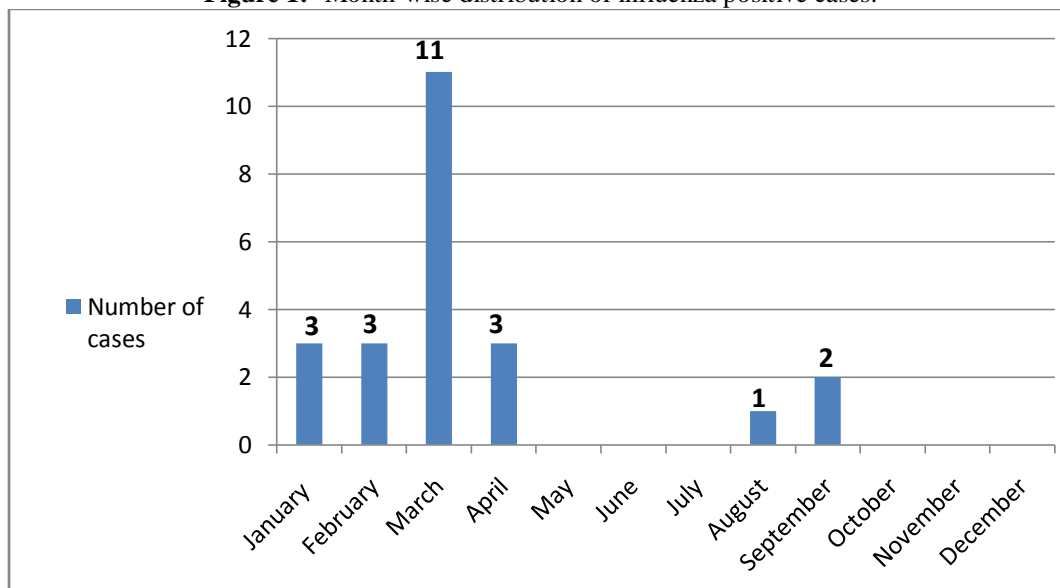
The influenza outbreak had peak with highest number of positive cases during March .

Discussion:-

Influenza A H1N1 pdm09 outbreak in 2009 had 27,236 confirmed cases and 981 deaths in India. The post-pandemic period in 2010 resulted in 20,604 confirmed cases with more deaths(1763). Severely affected states were Maharashtra, Delhi, Rajasthan, Gujarat, Madhya Pradesh, Karnataka, Haryana, Kerala, Tamil Nadu and Andhra Pradesh with high fatality in Rajasthan. Another influenza outbreak hit in India in 2015, during which highly affected states were Rajasthan, Gujarat, Delhi, Maharashtra, Karnataka and Madhya Pradesh with more number of deaths in Rajasthan and Gujarat (5,6). We received samples from 5 districts of Jharkhand. Ranchi was the most affected district, followed by Jamshedpur, Simdega, Ramgarh, Dhanbad, Chatra and Daltenganj districts with equal number of cases.

Fewer cases from other districts were because of lack of awareness about the existence of the testing centre or truly the districts were spared from influenza infections could not be ascertained.

The influenza outbreak had peak with highest number of positive cases during March . Equal number of cases occurred in other months of the year. In a study by Arbat et al. [2] in 2015, the influenza epidemic peaked in the last week of February and first week of March and thereafter subsided till the first week of April. Kashinkunti et al. [7] in their study reported that swine flu cases were more in summer months, that is, July–September whereas Chudasama et al. [8] and Siddharth et al. [9] reported more number of cases during winter months. Studies by Gurav et al. [10] from Panchgani (Maharashtra) and Biswas et al. [11] from Kolkata (West Bengal) reported that the outbreaks of influenza A H1N1 pdm09 were common in monsoon season.[10,11]

Of the total 23 positive cases, 9 (39.13%) were female and 14 (60.86%) were male. This is in concordance to a study by Arbat et al.[2] In a study by Shukla et al.,[15] 86% of the patients were male and 14% were female. They suggested the poor accessibility of health services to females and more travel and outdoor movement for business purpose by males as the major contributing factors for this. Revdiwala et al. [16] also reported higher prevalence of influenza infection among males .

Maximum number of suspected cases was in Group III, followed by Group IV , Group I and Group II in descending order. The highest number of positive cases belonged to age Group III, followed by Group IV and Group II in descending order. There was no positive case in Group I . In a study by Pollock et al.,[17] the < 5-year age group comprised 73.9% of the laboratory-confirmed cases and 78.3% of ILI cases.

Majority of the positive cases had the clinical manifestations of fever, cough , sore throat , nasal discharge, breathlessness, bodyache, headache ,nausea/vomiting ,myalgia, followed by chest pain, abdominal pain, diarrhoea and ear discharge in decreasing order which was common among all influenza - positive cases.

Conclusion:-

Early case detection can reduce the burden of disease, so the health system should be strengthened and voluntary early reporting should be encouraged . Influenza outbreaks in Jharkhand are to be studied more extensively so as increase the vaccination drive and specially for individuals with comorbidity.The silent spread of the virus is mainly because of lack of awareness. The need for spread of awareness regarding the modes of spread and the preventive measures which can be followed are to be practised by the community. Maintaining good hygiene besides avoiding contacts with animals like pigs are the only preventive measures for the virus.

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