

Brief epidemiological report of influenza a (H1N1) outbreak in Bihar, 2015

Abstract

Bihar reported an increased number of cases with influenza like illness (ILI) during February to April 2015. The cases were investigated to confirm the outbreak, descriptive epidemiology of the cases was studied and control measures were undertaken for the control of outbreak. A suspected case of influenza like illness (ILI) was defined as acute onset of fever ($>38^{\circ}\text{C}$) with cough or sore throat and a confirmed case as ILI case with throat swab positive for influenza A (H1N1) on RT-PCR. The demographic and clinical details were collected from patients attending the swine flu OPD of Rajendra Memorial Research Institute (RMRI), Patna (State Nodal Lab for H1N1 diagnosis) during Feb 24 2015 to Apr 23 2015. Overall 1269 patients with ILI attended the swine flu OPD of RMRI during the study period, of which 346 were positive for influenza A (H1N1). 2 patients died (case fatality ratio: 0.57%). Besides fever, common symptoms included cough (71%), running nose (52%), sore throat (43%), respiratory distress (22%) and diarrhea (2%). Out of 2 deaths, 1 case had co-morbidity. The outbreak started on 23 Feb, showed 2 peaks, one from 28 Feb to 4 Mar and other peak from 18 Mar to 22 Mar. The peak subsided by 23 Apr 2015. Out of total 346 H1N1 positive cases, 74% were indigenous while 26% showed migration history from other Swine flu affected States. Age group 21-30 (31%) was most affected.

Males (61%) were more affected than females (39%). State Health Department implemented several interventions to limit the outbreak including daily screening of passengers visiting the State from other Swine Flu affected States at key railway stations and Airports, Helpline Number was activated in each district to address public queries on H1N1, training of medical officers and health care providers in case management and infection control, vaccination of health care workers, creation of isolation wards and administration of Oseltamivir to ILI patients, daily monitoring on the health status of each case and IEC activities on community health education through newspapers, media etc.

Keywords: Influenza A, H1N1, Swine flu, RT-PCR, Oseltamivir, Immunogenic

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Abbreviations: PHEIC, Public Health Emergency of International Concern; ILI, Influenza Like Illness; RMRI, Rajendra Memorial Research Institute; RT-PCR, Reverse Transcriptase Polymerase Chain Reaction

Introduction

Influenza (flu) is a viral infectious disease. The influenza viruses may be of 3 types A, B and C. Both A and B viruses are responsible for outbreaks and epidemics.¹ Influenza pandemics are generally unpredictable.² A novel influenza H1N1 was reported in Mexico and USA in 2009.³ WHO declared the emergence of this virus as Public Health Emergency of International Concern (PHEIC) and informed that the disease caused by virus may become pandemic. From 2009 till Aug 2010, 214 countries were affected worldwide and 18449 deaths were reported.⁴ In India, first confirmed case of H1N1 was reported in May 2009 in Hyderabad.⁵ The virus is spread by droplet infection, coughing, sneezing and by close contact with infected person. Children and immuno-compromised patients are more vulnerable to the disease. Sudden onset of symptoms is seen that may last for several days.⁶ Several intervention methods have been tried to contain the H1N1 outbreaks like installation of thermal scanners at Airports and asking the travelers to declare fever or respiratory symptoms at disembarkation. However, the utility of these interventions have been challenged, although if properly executed, the community transmission of the disease can delay by few weeks.⁷⁻⁹

As per a study, school closures reduced population transmission when implemented early.⁹ Use of personal protective interventions like using the masks, hand hygiene and early isolation has also proved beneficial to reduce disease transmission at individual level in home settings.^{10,11} Antiviral like Oseltamivir and Zanamivir have been found to reduce disease severity with no adverse risks.^{12,13} Vaccines to prevent disease transmission have been found to be immunogenic, effective and safe.¹⁴ In Bihar, 346 H1N1 cases including 2 deaths were reported from Feb 2015 till April 2015. In comparison, from Jan 2015 till 15 April 2015, 35130 cases and 2209 cases of H1N1 were reported at the National level. Case Fatality due to the disease was 6.28 at the National level while it was 0.57 in case of Bihar. Outbreak investigation was done to confirm the etiology, cases were classified by time, place and person for descriptive epidemiological studies, daily monitoring of the health conditions of each case was done and control measures were recommended and taken by the Health Department, Govt. of Bihar. The report highlights the impact of strengthening the disease surveillance to improve the desired outcomes.

Methods

Case definition

A case of influenza like illness (ILI) was defined as an acute onset of fever ($>38^{\circ}\text{C}$) with or without cough or sore throat in the absence of any other diagnosis.¹⁵ A person with ILI with laboratory confirmation for influenza A (H1N1) on a throat swab by real time

reverse transcriptase polymerase chain reaction (RT-PCR) was considered as confirmed case of pandemic influenza (H1N1).¹⁶ All the patients meeting the above case definitions and attending the swine flu OPD of RMRI, Patna, were included in the study.

Data collection

At the time of collecting throat swabs for laboratory confirmation, complete address of the suspected patients was collected. Patients with positive laboratory tests for pandemic H1N1 were encouraged to get admission in the swine flu ward of Infectious Disease Hospital, Patna for treatment. Patients (or their relatives) admitted in other nursing homes/private hospitals were also contacted using the addresses provided by them. Daily sharing of the line list of the cases as collected from State Nodal Lab was shared with the District Surveillance Unit for follow-up of the cases, for contact tracing, for collecting other details like demographic details, residence, date of onset of illness, clinical details, results of laboratory investigations, history of travel within and outside the country and history of contact with positive case of influenza (H1N1).

Laboratory investigation

Throat swabs were collected from all the suspected ILI patients from various districts in sterile viral transport medium and transported under cold chain to the RMRI, Patna the State nodal laboratory, for RT-PCR.

Data analysis

The cases were analyzed with respect to time, place and person. Daily reporting and analysis was also done on the number of passengers screened at key railway junctions and 2 Airports in the state, daily reporting on the health conditions of the cases and on the number of calls received by the districts on the Helpline number was done in prescribed format.

Results and discussion

(Figure 1), (Tables 1-4) Overall 1269 patients with ILI attended the swine flu OPD of RMRI, Patna during the study period, of which 346 were positive for influenza A (H1N1). 2 patients died (case fatality ratio: 0.57%). Besides fever, common symptoms included cough (71%), running nose (52%), sore throat (43%), respiratory distress (22%) and diarrhea (2%). Out of 2 deaths, 1 case had co-morbidity. The outbreak started on 23 Feb, showed 2 peaks, one from 28 Feb to 4 Mar 2015 and other peak from 18 Mar to 22 Mar 2015. The peak subsided by 23 Apr 2015. Out of total H1N1 positive cases, 74% were indigenous while 26% showed migration history from other Swine flu affected States. Age group most affected was 21-30(31%)>11-20 (16%)>31-40 (16%). Males (61%) were more affected than females (39%). State Health Department implemented several interventions to limit the outbreak. In view of upsurge of H1N1 cases in other States, Govt. of Bihar issued Health Alert (including all guidelines and protocols) to all the districts & Govt. MC & Hospitals on 12th Jan 2015, daily reporting of H1N1 cases started from 13th Jan 2015, drugs, kits, PPEs and logistics was made available in all key Hospitals including district level hospitals. Health Advisory was issued for Schools and for travellers visiting the State from Swine Flu affected States. Rapid Response Team was activated in each district for outbreak management. Regular monitoring of Swine Flu preparedness by the districts via Video-Conferencing was done at the level of Principal Secretary Health, Govt. of Bihar. Screening of passengers coming from Swine Flu affected States at key Railway Stations and Patna and Gaya Airport was done on daily basis.

Cleanliness drive in Slum areas was done in coordination with Nagar Nigam. Helpline Number was activated in each district to address the queries raised by general public on Swine Flu. Isolation Ward was prepared and made ready to manage the cases in all key hospitals in the State. Orientation of Medical Officers (MOs) from each district and to the Health Workers, Panchayats Pramukhs was done for early reporting, referral and for case management. 8292 passengers were screened at railway stations while 710 and 576 passengers were screened at Patna and Gaya Airport respectively. Approximately 2300 calls were responded during the outbreak period on the Helpline Numbers provided by the districts. Intensive IEC activities for spreading awareness on Swine Flu in the State were carried out. Regular advertisements for do's and don'ts for Influenza A H1N1 was issued by State Health Society, Bihar in local newspapers. Radio Spots were aired. Visual media materials were rolled out at Railway Stations and on local Television. Banners and Posters on Swine Flu were displayed at key places in the districts for raising awareness among the general public. Daily situation was closely monitored by the State Surveillance Unit on case to case basis.

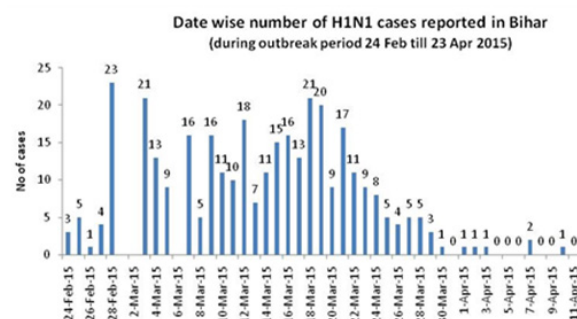


Figure 1 Date wise distribution of Swine Flu cases in Bihar in 2015.

Table 1 Place distribution of Swine Flu in Bihar

SI No	District	Cases	Deaths
1	Begusarai	8	0
2	Bhojpur	19	1
3	Darbhanga	4	0
4	Gaya	5	0
5	Kishanganj	1	0
6	Lakhisarai	9	0
7	Madhubani	3	0
8	Motihari/E Champaran	2	0
9	Muzaffarpur	2	0
10	Patna	241	1
11	Purnea	3	0
12	Samastipur	2	0
13	Vaishali	17	0
14	Gopalganj	2	0
15	Aurangabad	1	0
16	Nalanda	7	0
17	Nawada	1	0
18	Kaimur/Bhabua	3	0
19	Madhepura	1	0
20	Siwan	1	0
21	Bhagalpur	3	0
22	Saran	2	0
23	Supaul	1	0
24	Munger	2	0
25	Arwal	2	0
26	Khagaria	2	0
27	Jharkhand	1	0
28	Gujarat	1	0
Total		346	2

Table 2 Person distribution of Swine Flu cases in Bihar

Age Group	Frequency	Percentage (%)
0-10	45	13
11-20	54	16
21-30	108	31
31-40	54	16
41-50	42	12
51-60	34	10
61-70	7	2
71+	2	<1
Total	346	100
Sex	Frequency	Percentage (%)
Male	212	61
Female	134	39
Total	346	100

Table 3 Travel History status of Swine Flu in Bihar

Travel history wise cases of swine flu in Bihar	
UP	17
Delhi	18
Gujarat	7
Rajasthan	15
Gujarat & Rajasthan	1
Mumbai	3
Goa	3
Mumbai & Goa	1
Kolkata	2
Delhi & Kolkata	1
MP	5
Jharkhand	4
Nepal	1
Pune, Mumbai & Delhi	1
Mangalore	1
Assam & Meghalaya	2
Meghalaya	1
Delhi, Ranchi & Chandigarh	1
Indore & Delhi	1
Hyderabad	1
Delhi, Shimla, Manali	3
No travel history (indigenous in Bihar)	257
Total	346

Table 4 Outcome of H1N1 cases in Bihar

Total samples tested till 23 April 15	1269
Samples positive	346
Cured	341 (96%)
Deaths	2
Traceless	2
Cross-notified cases & deaths from other States	6 cases & 4 deaths
Total passengers screened at District Railway stations	8292
Total passengers screened at Patna Airport	710
Total passengers screened at Gaya Airport till date	576

Conclusion

From 24 Feb 2015 till 23 Apr 2015, 346 confirmed H1N1 cases including 2 deaths were reported in the State. In comparison, from Jan 2015 till 15 April 2015, 35130 cases and 2209 deaths due to H1N1 were reported from various States at the National level. Case Fatality due to the disease at the national level was 6.28 while it was 0.57 in case of Bihar. Daily monitoring of the health conditions of each case was done and control measures were taken by the Health Department,

Govt. of Bihar. Due to rigorous monitoring and active involvement by the Health Department at the State level, the H1N1 outbreak was efficiently managed and substantial mortality due to the disease was reduced in the State when compared to other States where many deaths were reported. The report would guide other outbreak prone States for early preparedness and to ensure public health response to manage future outbreaks due to H1N1.

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Conflicts of Interest

None.

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