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Clinical and Laboratory Profile of H1n1 Influenza in Children and Adolescents in Tertiary Care Centres

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Abstract

Introduction: Influenza viral infections cause a broad array of respiratory diseases that are responsible for significant morbidity and mortality in children.

Influenza A viruses also have potential to cause periodic global Pandemics with higher penetration of illness than seasonal epidemics. Swine origin Influenza has become the first pandemic of the 21st century. The currently circulating strain of swine origin influenza virus, the H1N1 strain has undergone triple reassortment and contains genes from the avian, swine and human viruses. This virus was first reported in Mexico in April 20095 and spread to various countries worldwide. Higher morbidity (27236 cases) and mortality (981 deaths) have been reported from India. As per WHO, the Pandemic influenza A (H1N1) virus is now considered as seasonal virus.

Objectives: (1) To know the pattern of clinical presentation of H1N1 influenza in children. (2) To know the risk factors predisposing to serious illness in H1N1 influenza in children. (3) To analyse the laboratory profile of children with H1N1 influenza infection.

Methodology: A hospital based cross sectional observational study was conducted from March 2017 to March 2019. The study had ethical clearance from Institute ethical committee. All suspected cases were confirmed by RT-PCR performed at Institute of preventive medicine, Narayanguda and Fever hospital, Nallakunta. A total of 80 H1N1 positive patients from tertiary care centres (Niloufer hospital, Gandhi hospital, Fever hospital) were studied during a period of 24 months.

Data was analysed using SPSS software and using chi square tests.

Results: Comparison of mean age, gender and clinical presentation of H1N1 influenza infected children showed that maximum number of cases were below 2 years with slight male predominance. The most common clinical presentation was fever (100%) and most (80-96%) had respiratory symptoms. Abnormal chest X Ray findings with bilateral involvement in 49% cases and lobar consolidation in 10.6 % cases. Of all the cases, 18.6% required CPAP and 13.3% required ventilatory support.

Conclusion: Demographic profile according to present study showed more cases in February and March. The rate of reported cases and hospitalisation rates were highest among children less than 2 years. In our study, more than 90% of positive cases met the definition of influenza like illness.

Factors predicting the severity of illness were presence of congenital heart disease, lung disease, immunosuppression, malnutrition. Abnormal chest X Ray and Arterial Blood Gas values and requirement of mechanical ventilation predicted poor outcomes.

Keywords: Children, Influenza; H1N1 infection; RT-PCR; Epidemic; Pandemic; Antigenic drift and shift; pneumonia; Influenza like illness; Malnutrition,anemia; Acidosis; Mechanical ventilation.

Introduction

Case Definitions

The following definitions have been provided by the United States Centers for Disease Control and Prevention:

1. Influenza like illness (ILI) is defined as fever [temperature 100oF (37.8oC) or more] with cough / sore throat without a known cause other than influenza.
2. A confirmed case of pandemic H1N1 influenza A is an individual with an ILI with laboratory confirmed H1N1 influenza A virus, detected by real-time reverse transcriptase (rRT)-PCR or culture.
3. Pandemic H1N1 influenza A may be suspected in an individual who does not meet the definition of confirmed pandemic H1N1 influenza A, and has an ILI and an epidemiologic link.

Virology

Influenza Subtypes

Clinical influenza can be caused by several different influenza subtypes, though H1N1 is the most common subtype in both swine and human infections. Human cases of swine H3N2 influenza A virus infection has been reported rarely.[4] Other subtypes that have been circulating in pigs include H1N2, H3N1, and H3N2.

Influenza Virus 3 Types

Type A	Type B	Type C
Causes significant disease: epidemics, global pandemics	Causes significant disease: milder epidemics	Does not cause significant disease
Infects both humans and other species	Limited to humans	Limited to humans
Frequent antigenic variations	Infrequent antigenic variations	Antigenically stable

Aims and Objectives

1. To know the pattern of clinical presentation of H1N1 influenza in children.
2. To know the risk factors predisposing to serious illness in H1N1 influenza in children.
3. To analyse the laboratory profile of children with H1N1 influenza infection.

Materials and Methods

Setting: Patients admitted with diagnosis of H1N1 influenza in tertiary care center, Hyderabad were evaluated in the study

Ethical Committee Approval: Institute ethical committee approved the study

Study design: Cross sectional observational study

Duration of Study: 24 months

Inclusion Criteria: All children diagnosed with H1N1 influenza diagnosed by RT-PCR

Exclusion criteria: Those who have not given consent

Sample Size: 75 cases

Period of Study: 2017 (March)-2019 (March)

Target Population: All children below the age of 18 years.

Methodology

A hospital based cross sectional observational study was conducted from March 2017 to March 2019. The study had ethical clearance from Institute ethical committee. All suspected cases were confirmed by RT-PCR performed at Institute of preventive medicine, Narayanguda and Fever hospital, Nallakunta. A total of 80 H1N1 positive patients from tertiary care centres (Niloufer hospital, Gandhi hospital, Fever hospital) were studied during a period of 24 months. A confirmed case of pandemic H1N1 influenza A is defined as an individual with an ILI with laboratory confirmed H1N1 influenza A virus detected by RT-PCR. During this period the clinical profile and laboratory profile of H1N1 cases was analysed.

Data was analysed using SPSS software and using chi square test. The clinical parameters with which the child presented were assessed. The lab parameters included Hemoglobin%, leucocyte count, Platelet count, Renal parameters, Arterial Blood gases, Chest Radiography.

Statistical analysis

Following statistical method has been employed in the present study. Pearson correlation coefficient and Fisher Exact test calculator was used with contingency tables.

Observations and Results

Case distribution

Table 1: Time Distribution of Cases

Time period	Cases
March	11
April	8
May	–
June	–
July	5
August	7
September	9
October	6
November	5
December	5
January	6
February	13

Table 2: Age Distribution of Cases.

Age distribution	No. of cases (%)
<6 mo	10 (13.3%)
6mo - 1yr	18 (24%)
1 to 2yrs	20 (26.6%)
w2 to 5 yrs	12 (16%)
> 5 yrs	15 (20%)

Table 3: Sex Distribution of Cases

Total cases	No. of cases	% of cases
Males	40	53.4%
Females	35	46.6%

Table 4: Clinical Manifestations.

Symptoms	Percent	Symptoms	Percent
Cold	54%	Headache	5%
Cough	80%	Eye congestion	25%
Fever	100%	Cyanosis	7%
SOB	96%	Inability to feed	49%
Sore throat	5%	Drowsiness	20%
Vomitings	57%	Hemoptysis	0%
Diarrhea	45%	Somnolence	22%
Seizures	18%	Skin rash	1%

Cough, Fever and Shortness of breath were the main clinical features associated with almost all of the cases.

Of all the cases 18% (15) cases presented with seizures out of which 9 children had febrile seizures while 6 children had Encephalitis picture with altered sensorium.All children with Encephalitis presentation succumbed to death.

Table 5: Risk Factors.

Risk factor	Percentage of cases	P value
Asthma	0%	
Tuberculosis	0%	
Congenital heart disease	4%	<0.05
Diabetes	0%	
Renal anomalies	0%	
Immunodeficiency	0%	

Table 6: Malnutrition.

Nutritional status	
Normal	39%
PEM Grade 1	11%
PEM Grade 2	23%
PEM Grade 3	4%
SAM	14%

Lab Parameters In H1n1 Influenza Patients.

Table 7: Hemoglobin Level (Anemia).

	<7	7 -9.9	10-10.9	>/=11
No. of cases	7	39	15	14
% of cases	11%	49%	20%	20%

Renal Parameters

Of all the cases, 8% (7) cases were associated with deranged renal parameters. Deranged renal parameters at admission was significantly associated with mortality with a P value 0.0001.

Leucocyte Count

Of all the cases, 25 (33%) cases were associated with leucocytosis (>11000) and leukopenia in 24% (18) cases. Leucocytosis was significantly associated with mortality with a P value of 0.0053.

Table 8: Leucocyte Count.

	N(%)
Normal	32(42%)
Leucocytosis	25(33%)
Leucocytopenia	18(24%)

Table 9: Radiographic Findings.

X Ray findings	No. of cases(%)
Normal	25 (33%)
Bilateral diffuse infiltrates	37 (49%)
Lobar Consolidation	8 (10.6%)
ARDS	5 (6.6%)

Table 10: Arterial Blood Gases

	Normal	Acidosis
No. of cases	52	13
% of cases	69%	17.3%

ABG was not done in 10 cases.

Respiratory and Metabolic acidosis at admission time was significantly associated with mortality with P value <0.00001.

Table 11: Complications.

	No. of cases	% of cases
Pneumonia	26	34%
ARDS	5	6%
MODS	8	10%
Sepsis with Shock	6	6%

About half of the positive cases had complications and of all the complications, Pneumonia was found in 26%, ARDS in 5%, MODS in 8% and Septic Shock in 6%.

Table 12: Ventilatory Requirement.

	CPAP	Ventilator
No. of cases	14 (18.6%)	10 (13.3%)

Table 13 : Ventilatory Requirement And Outcome.

	Alive	Dead	Total
Ventilator used	4	8	12 cases
Not used	63	0	63 cases

Ventilator requirement was an independent risk factor correlating with higher mortalityrate and poor prognosis in H1N1 patients. P value<0.01.

Discussion

Clinical and laboratory profile of H1N1 positive children was studied in the age group below 18 years. The study population included 75 children positive for H1N1 Influenza. The study was conducted during the period of March 2017 to March 2019.

The 2009 pandemic of H1N1 Influenza rapidly spread globally, causing significant mortality and morbidity. It was first pandemic since 1968. This outbreak involved more than 170 countries and spread over many continents with more than one lakh people affected. The reason for the rapid spread is because many people have mild symptoms and donot seek treatment and those who seek treatment don't officially get tested and most of the times, it is only hospitalized people who get tested.

H1N1 is a flu virus and spreads between people in the same way that seasonal flu viruses spread, that is, through droplets or fomites. Incubation period is around 2-7 days.

Symptoms of H1N1 are flu like symptoms, Fever, cough, coryza, headache, myalgia, and joint pain. Less common symptoms are vomiting, diarrhea, conjunctivitis, and parotitis.

In this present study, admission rate was more in February and March with 32% cases being admitted in the two months. Similar findings was observed in the study conducted by Sujatha et al.

Table 14: Comparison of mean age distribution of present study with similar studies.

Study	Mean age
Present study	3yrs +/- 2.5 yrs
Das et al	7.5 +/- 3.5 yrs
Hema Gupta et al	3.5 yrs

Mean age distribution was 3+/-2.5 years. Maximum number of cases were below 2 years. This finding correlates with the age distribution of other studies.

Table 15: Comparison of gender distribution of present study with similar studies.

Study	Males%	Females%
Present study	53.4%	46.6%
Sujatha et al	61%	39%
SheoPratap et al	60%	40%

Sex distribution of cases is with slight male predominance (53.4%) and females (46.6%).

Table16: Comparison of clinical manifestations of cases in present study with similar studies.

Study	Fever	Cough	SOB	Seizures	Sore throat
Present study	100%	80%	96%	18%	5%
Sujatha et al	90%	90%	23%	2%	3%
Ramya HS et al	100%	100%	18.6%	-	17.1%
Pushpalatha et al	100%	97.5%	73.1%	-	17%

All of the children had fever (100%) and most of them had cough and Shortness of breath (80% and 96%). This finding coincided with other studies.

Of the 18% of cases which presented with seizures in the present study, 9 children had febrile seizures and recovered while 6 children had prolonged encephalopathy with encephalitis picture. All children with Encephalitis presentation succumbed

to death.

Of all the cases 4% of the cases were associated with congenital heart disease with increased risk of mortality in such association with P value <0.05. One child was a known case of steroid dependent nephrotic syndrome presented with Pneumonia with throat swab positive for H1N1.

Nutritional status of the children in the present study was normal in 39%. 14% were with Severe Acute Malnutrition. SAM is a significant risk factor for serious outcome with P value 0.0248.

Among the laboratory parameters, Severe Anemia was found in 11%. About half of the children had moderate anemia. Leucocytosis was found in 48% cases and leucopenia in 24% cases with significant risk of prolonged hospitalisation and increased risk of serious outcome in children with leucocytosis (p value 0.0053). Similar finding was observed in a study by Hema Gupta et al where children had leucocytosis more than leukopenia and leucocytosis associated with prolonged hospital study in their study. Of all the cases, 8% of the cases were associated with deranged renal parameters. Deranged renal parameters at admission was significantly associated with mortality with a P value 0.0001.

Table 17: Comparison of Chest X-ray of present study with similar studies.

Study	Normal	Bilateral infiltrates	Lobar consoliation	ARDS
Present study	33%	49%	10.6%	6.6%
Aviram et al	60%	27%	13%	-
Pushpalatha et al	18.2%	81.8%	-	-

Chest X Ray findings were normal in 33% children.

ARDS picture in 6.6% cases. And it was significantly associated with mortality with a statistical significance of <0.00001.

Acidosis (both metabolic and respiratory) was found in 17.3% of cases. Blood gases have been found to predict mortality with Respiratory and Metabolic acidosis being significantly associated with mortality (P value <0.0001).

Table 18: Comparison of common complications in present study with similar studies.

Study	Common Complication
Present study	Pneumonia (34% cases)
Aasiya Unjum et al	Pneumonia

Pneumonia was the most common complication observed in the present study in 34% cases. Similar finding was observed in study conducted by Aasiya Unjum, Aijaz Ahmed et al. ARDS, MODS and Septic shock were other complications.

Of all the cases, 14 cases (18.6%) required CPAP support and 10 cases (13.3%) required Ventilatory support.

	CPAP	Ventilator
No. of cases	14 (18.6%)	10 (13.3%)

While all the children with CPAP recovered, only 4 out of 12 ventilated cases recovered. The remaining 8 succumbed to death.

Table 19: Outcome Of Mechanical Ventilation In Present Study.

	Alive	Dead	Total
Ventilator used	4	8	12 cases
Not used	63	0	63 cases

Ventilator requirement was an independent risk factor correlating with higher mortalityrate and poor prognosis in H1N1 influenza patients with a P value<0.01.

Conclusion

- The number of cases reported were more in February and March.
- The rate of reported cases and hospitalisation rates were highest among children <2 years.
- H1N1 cases were distributed almost equally in both the sexes with slight male preponderance.
- In our study more than 90% of positive cases met the definition of Influenza like illness (fever + cough/sorethroat).
- The risk of severe outcome was associated with the presence of one or more underlying comorbid conditions.
- Coexisting Congenital heart disease was associated with severe outcome with a significant P value (<0.05). One case was associated with steroid dependantnephrotic syndrome.
- In this study, 39% children had good nutritional status.
- 14% of all the cases were with Severe Acute Malnutrition. SAM was significantly associated with mortality with P value 0.0248.

- H1N1 pneumonia was found to have bilateral diffuse infiltrates in 49% cases.
- 33% of cases had normal radiograph findings.
- Lobar involvement with consolidation was observed in 10.6% of cases.
- ARDS picture in 6.6% cases. And it was significantly associated with mortality with a statistical significance of <0.00001.
- Blood gases have been found to predict mortality with Respiratory and Metabolic acidosis being significantly associated with mortality (P value <0.0001).
- About half of the affected children had moderate anemia.
- 11% had severe anemia.
- Leucocytosis was observed more commonly than leukopenia and also a more better predictor of increased hospital stay.
- In this study, deranged renal parameters at admission time were significantly associated with mortality.
- Of all the cases, 18.6% required CPAP and 13.3% required Ventilatory support. Requirement of mechanical ventilation is an important predictor of mortality.

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Perspectives of Medical Students Regarding use of Online Teaching Learning Method (e learning) during Covid Pandemic: A Cross Sectional Study Conducted in a Medical College of Western Maharashtra

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Abstract

Covid 19 Pandemic led to paradigm shift in teaching learning methods of medical education and online teaching was used as an exclusive and primary source of education in medical field also In many developed countries online teaching learning method is adopted on a large scale since last few years. However e learning activity of undergraduate and post graduate medical students is very limited as per many studies.

Blending of on line learning and face to face learning in medical education has a vast scope in future era of technology. Therefore a cross sectional study was conducted among second MBBS and Third MBBS students of a medical college in urban area, to understand the perceptions of medical students regarding advantages, disadvantages and barriers for the on line learning.

Methodology: Study design Observational study. Study participants second and third year medical students (n=280) Data was collected using a pre designed questionnaire and analyzed using SPSS software.

Results: Majority of the students (83.6%) used zoom platform for online learning. The approximate time spent on online learning significantly increased post covid. Out of 280 study participants, 59.6% (167) found that online learning gives them the ability to learn at own pace, 47.9% 9134) found that it gives flexibility of time. Regarding perceiveddisadvantages, majority of them 82.5% (231) felt that online learning prevents them from acquiring clinical skills, 47.9% (134) felt that the lack of interaction is a disadvantage.

Keywords: Medical Students; Online Study; E-learning.

Background

Nationwide strategies adopted to control Covid pandemic led to paradigm shifts in various fields including Medical Education. Inindia also due to nation wide lock down policies, during 2020 on line teaching learning method was used as an exclusive and primary source of education in medical education.

In many developed countries online teaching has played a key role inmedical education over recent

years.[1-2] While addressing the educational needs of health care workers WHO and the United Nations also recommended e learning as a effective tool particularly in developing countries.[3-4]

As mentioned in the booklet of Medical council of India, use of electronic means is highly recommended in the broad competency. An Indian Medical Graduate must have obtained this competency at the time of graduation.[5]

In this era of technology there is a vast scope for e-learning in medical education. Currently smartphones, computers providing internet access are the essential modalities in a life of a medical student. However most of the e-learning activity done by the students, residents in the medical colleges is limited to data search for their research work. The use of technology in medical education in other areas is in a nascent stage.[6]

Exclusive use of online teaching learningduring pandemic control phase, was a sort of different experience for the students as well as teachers. Therefore the present study was conducted to understand the perceptions of medical students regarding on line learning and to assess the advantages, disadvantages perceived by the medical students while adopting this new technology exclusively.

Methodology

Study Design Observational study

Study Participants: A cross sectional study was conducted among second year and third year medical students of DVVPFs Medical College during December 2020 to March 2021.

Sampling technique and Sample Size: All the students studying in fourth and sixth semester of DVVPFs medical college were included for the online survey as a part of the study. Out of 300 students 280 students responded to online survey, so the final sample size of our study was 280.

Ethical Approval: was obtained from the institutional Ethics committee before starting this study.

Data Collection: Pre designed questionnaire prepared from literature search was used for data collection.[1,6,7] Both open ended and closed ended questions were used to assess the information regarding use and experience of e-learning ,perception of barriers and benefits and opinions about on line learning. Google forms were created and sent to three hundred students. Out of three hundred students two eighty students responded. Responses were compiled and analyzed using appropriate statistical techniques.

Statistical Analysis: Data was compiled and analyzed using SPSS software. T test and chi square tests were used for tests of significance.

Results

This Cross sectional observational study was conducted among 280 medical students of second (n=135) and third professional year (n=145) of Dr VitthalraoVikhe Patil Medical College Ahmednagar Maharashtra.

Sociodemographic Profile of Participants: A majority (89.63%) of the participants are in the age group of 20-22yrs. Out of total 280 participants, 45.4% (127) were female while 54.6% (153) were male. We have included information related to type of residence whether urban or rural purposefully because internet connectivity issues are more common in rural areas. In our study a majority of students were residing in urban area (66.43%), however 94 (33.57%) were from rural area.

Devices used: Out of 280 study participants, 92.86% (260) use a mobile phone for learning, 10% (28) use a tablet, 9.64% (27) use a laptop and 2.14% (6) use a personal computer. A major proportion of students use their mobile phones for learning online. Zoom was the most common platform used for online learning in 234 students (83.6%) followed by Google classroom in 23 (8.2%).

Out of all participants internet connectivity issues were faced occasionally by 148 students (52.9%), frequently by 93 students (33.2%), seldomly by 31 students (11.1%) and never by 8 students (2.9%).

Mean time spent pre covid was 1.57 ± 1.08 while post covid it was 2.58 ± 1.84 hrs. The approximate time spent on online learning significantly increased post covid. ($p < 0.001$)

Table 1: Approximate time spent on online learning – pre and post Covid-19 pandemic

Time Spent	Pre Covid	Post Covid	
No Online Learning	19	0	
< 2 hours	129	74	
2 to 4 hours	104	136	
4 to 6 hours	28	61	
More than 6 hours	0	1	
Total	280	280	
Mean ± SD	1.57 ± 1.08	2.58 ± 1.84	$p < 0.001$ (Significant Difference)

This could be explained by the facts that due to nation wide lock down strategy used for pandemic control; on line learning was the most commonly used modality for teaching learning.

Perceived advantages: Out of 280 study participants, 59.6% (167) found that online learning gives them the ability to learn at own pace, 47.9% 9134) found that it gives flexibility of time and 41.1% (115) found online learning to be more comfortable.

Table 2: Perceived disadvantages & barriers of online learning: (Multiple response)

a. Perceived disadvantages	Frequency
Lack of acquiring clinical skills	231 (82.5%)
Lack of interaction	134(47.9%)
Les effective	101(36.1%)
b. Perceived barriers	
Internet issues	194(69.3)
Distractions/ Difficulty of concentration	131(46.8)
Lack of devices	19 (6.8%)

Perceived disadvantages: Majority of them 82.5% (231) felt that online learning prevents them from acquiring clinical skills, 47.9% (134) felt that the lack of interaction is a disadvantage, while 36.1% (101) students, found online learning less effective. A majority of students found the lack of acquiring clinical skills as a major disadvantage of online learning. Internet issues (69.3%) and difficulty in concentration (46.8%) and lack of devices were the most common perceived barriers. (Table 2)

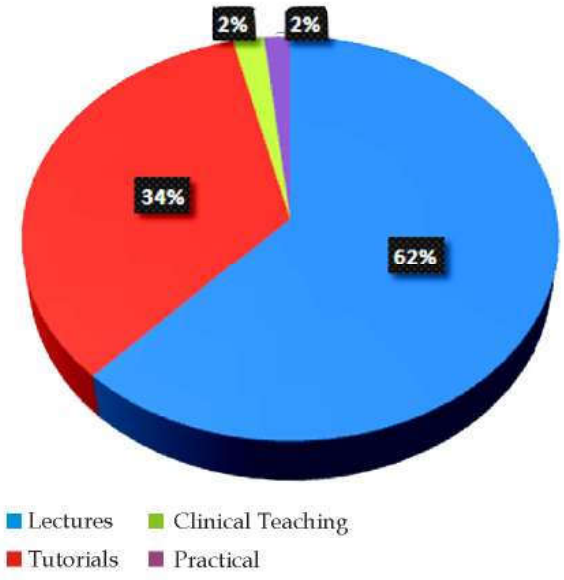

Fig.1: Students perspective about type of teaching method.

Table 3: Students Responses about on line teaching (1 is strongly agree –5 is strongly disagree).

Questions		1	2	3	4	5	Total
The teaching is as effective as face to face teaching	Frequency	21(7.5%)	43(15.4%)	79(28.2%)	92(32.9%)	45(16.15)	280
The teaching is often stimulating	Frequency	10(3.6%)	44(15.7%)	139(49.6%)	57(20.4)	30(10.75)	280
I would like the online teaching to be more interactive	Frequency	36(12.9%	89(31.8%	73(26.1%)	46(16.4%	36(12.9%	280
I prefer online teaching to face to face teaching	Frequency	24(8.6)	44(15.7%	54(19.3%)	76(27.1)	82(29.3%	280

Out of 280 study participants, 22.9% (64) felt that online teaching is as effective as face to face teaching, 49% (137) felt that it is not as effective while 28.2% (79) remained neutral. 24.3% (68) students prefer online teaching to face to face teaching while 46.4% (158) do not prefer online teaching. (Table 3)

Preference for teaching method out of 280 study participants, 62.5% (175) preferred that only face to face teaching, 11.8% (33) preferred only online teaching, whereas 25.7% (72) perceived blending of both the methods. Majority of the students prefer face to face teaching for learning.

The preference for face to face teaching was significantly more by third MBBS students as compared to second MBBS students. In third MBBS the main academic focus is on acquiring clinical skills for which face to face teaching is preferable option by the students. This may be the reason for significant difference about preference of face to face teaching among second year and third year students. (table 04)

Table 4: Preference for Online versus face to face learning in 2nd and 3rd year students.

	2nd MBBS	3rd MBBS	Frequency
Both	45	27	72
Face to face	63	112	175
Online	27	6	33
Total	135	145	280
X2 = 31.27, df = 2, p < 0.001			

Discussion

Present study was conducted among third year (Third Minor) and second year medical students and their perceptions about online teaching learning method regarding its benefits, barriers and effectiveness are is assessed and analyzed. In our study, the time spent for on line learning is significantly more in during and after covid 19 pandemic. Similar to our study Dost et al[7] mentioned in their study conducted across 40 medical colleges in UK that the difference in hours prior to and during the COVID-19 pandemic were found to be significant ($p<0.05$).[7]

Distractions and difficulty in concentration were the common barriers faced during on line learning, similar finding was mentioned in two other studies conducted by Odoharty et al and Gulati Aet al.[1,8]

Majority of students in our study preferred face to face learning method. Abbas et al also reported in their study the negative attitude of students towards e-learning and preferred face to face learning because of poor internet access and stability.[9]

Conclusion

Due to Covid control guidelines on line method of teaching learning was used on wide scale in medical education. In our study regarding perspectives of medical students about on line learning ,majority of students preferred face to face learning method and only 25.7% preferred blending of both the methods.

In modern era of technology there is a wide scope and resources for online teaching and learning and blending of traditional and online method of teaching learning in medical education is the need of the hour.

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Influence of Social Media on Knowledge Regarding Prevention of COVID 19 among Public Attending Medical College Hospital, Thiruvananthapuram

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Abstract

Public awareness and prevention of COVID 19 infection play important roles in disease control; a lack of reasolllnable knowledge of infectious disease leads to low detection rates. The objective of the study was to assess knowledge regarding prevention of COVID 19 virus infection and to find out the association between use of social media and knowledge of public regarding prevention of novel corona virus. The research approach adopted for the study was quantitative approach and design was cross sectional design. The study setting was outpatient block of Medical College Hospital, Thiruvananthapuram. Sample size was 110. Tool used was structured questionnaire. 58.2% had good knowledge and 46 participants 41.8% had poor knowledge. The study showed no association between use of social media and knowledge of public regarding prevention of novel corona virus.

Keywords: Social media; Novel corona virus; Knwledge; Prevention of novel corona virus.

Introduction

Infection with corona virus disease (COVID-19) has become a severe public health issue worldwide. In march 2020,the world Health organization (WHO) declared that COVID 19 can be characterized as a pandemic. Therefore, it is of utmost important to prevent further spread of pandemic in public and health care settings. Public awareness and prevention of COVID 19 infection play important roles in disease control; a lack of reasonable knowledge of infectious disease leads to low detection rates. To raise public awareness, social media platforms are considered to be effective tools that contribute to the real time dissemination of information about current status of the disease and give appropriate advice to the public on how to avoid being infected. Examining social media in health contexts including public health communication, promotion and surveillance limited insight has been provided into how the utility of social media may vary depending on the particular public health objectives governing an intervention. The extent to which social media platforms contribute to enhancing public health awareness and prevention during epidemic disease transmission is unknown. Social media is an important element in disaster and health

crises related communication.[1] Widespread public engagement with social media platforms creates an effective ready made path to their application in the health care field. Social media platforms include a wide variety of networking sites. These platforms and many others can be used to create and publish knowledge and information about potential health and disease risks and interventions as well as healthy lifestyles and effective health policies and strategies.[2] In addition to being a global threat, COVID-19 is referred to as an infodemic. The COVID-19 pandemic has affected the usage of social media by the world's general population, celebrities, world leaders and professionals alike. Social media platforms are amongst the most widely used sources of information in the World. The easy and inexpensive access to the internet and a large number of registered users in these platforms make them one of the easiest and most effective ways to disseminate information. Social media has been used by news outlets organizations and the general public to spread both valid information and misinformation about the pandemic.[3,4] Social media communications present different attitudes towards news media reporting. A number of comments suspected the real purpose and authenticity of media coverage and criticized the over attention of epidemic reports rather than rational cognition. There are also comments criticized the spread of fake news and exaggerating reports by different media. In addition, people also warned that communication and social media might cause misleading information, and more accurate information should be accured from official sources.[3]

Methodology

The objectives of the study were to assess the knowledge regarding prevention of COVID 19 infection and to find out the association between use of social media and knowledge of public regarding prevention of novel corona virus. The research approach was quantitative research approach and design adopted cross sectional survey. Setting of the study was outpatient block of Medical College Hospital, Thiruvananthapuram. The sample consisted of 110 individuals attending the medical college hospital and were willing to give consent to participated in the study. Persons with psychiatric illness and who are critically ill were excluded from the study. Health care workers also excluded. The tool for data collection was semi structured questionnaire. It has three parts demographic details, assessment of awareness regarding prevention of COVID-19 and role of social media on prevention of COVID-19.

Results

The baseline data of the study participants depicted in Table 1. Amon the 110 participants 61 (55.5%) were females and 49 (44.5%) were males. 76 (69.1%) were between the age group of 21-40 years. 64 (58.2%) were educated up to school level 34 (30.9%) were graduated, 8 (7.3%) were diploma holders and 4 (3.6%) were professionals. Out of 110 participants, 47 (42.7%) were employed, 47 (42.7%) were unemployed and 16 (14.6%) were students. Out of 110 participants, 98 (89.1%) had no history of corona virus infection and 12 (10.9%) had history of corona virus infection. 95 (86.4%) had no family history of corona virus infection and 15 (13.6%) had family history of corona virus infection.

Table 1: Baseline data of the study participants (n =110)

Variable	Frequency	Percentage
Gender		
Male	49	44.5%
Female	61	55.5%
Age group in years		
<20	12	10.9%
21-40	76	69.1%
41-60	22	20%
Education		
School	64	58.2%
College	34	30.9%
Professional	4	3.6%
Others	8	7.3%
Occupation		
Employed	47	42.7%
Unemployed	47	42.7%
Student	16	14.6%
COVID 19 infection		
Yes	12	10.9%
No	98	89.1%
Family history of COVID-19 infection		
Yes	15	13.6%
No	95	86.4%

The primary objective of the study was to assess the knowledge regarding COVID 19 infection and the Fig. 1 shows the knowledge of the participants.

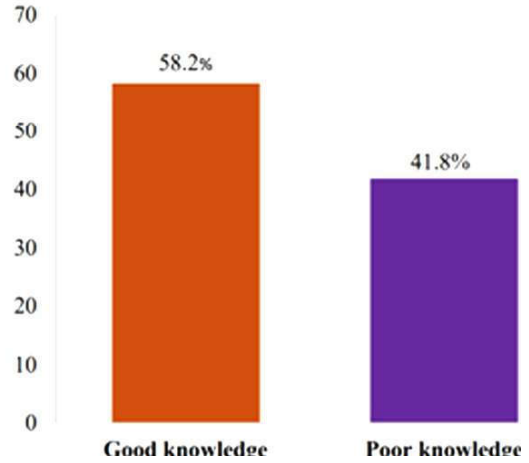

Fig. 1: Distribution of participants based on level of knowledge on prevention of COVID-19.

Table 2: Influence of social media on knowledge regarding prevention of COVID-19

Variable	Good Knowledge	Poor Knowledge	χ2
Source of Information			
Television	13	13	1.69
Newspaper	2	2	
Mobilephone	15	12	
All of the above	34	19	
Level of knowledge Gained from Social Media as Perceived by the Participant			
Yes	55	43	4.41
No	1	2	
Little bit	8	1	
Type of Social Media			
Facebook	17	19	5.13
WhatsApp	36	22	
Instagram	6	1	
Nil	5	4	

Table 2 shows the association between social media influence and COVID 19 knowledge. Out of 110 participants, 48 (43.6%) believed that they got >75% of information regarding COVID-19 through social media, 35 (31.8%) believed that they got 100% of information, 17 (15.5%) believed that they got 50-75% of information and 10 (9.1%) believed that they got >50% of information regarding novel corona virus. 3.6% of the participants revealed that they got information on preventive measures of COVID-19 from newspaper, 23.6% got information from Television, 24.6% got information from mobilephone and 48.2 % got information from all sources of regarding the preventive measures of COVID-19. But this could not find any association between influence of social media on knowledge regarding prevention of COVID-19

Discussion

A cross sectional study to assess the knowledge of the general people regarding the COVID-19 preventive measures was conducted among general people in Bangladesh with 436 participants in April 2020. The study reveals that only 21.6% of people had good knowledge regarding COVID-19 prevention.[5] But present study showed higher proportion of knowledge 58.2%. 4A study conducted in Lisbon, Portugal on "the impact and role of mass media during the pandemic, it was found that mass media have long been recognized as powerful forces shaping how we experience the world and ourselves. But the present study could not find any association between mass media and knowledge regarding COVID 19

Summary

The knowledge level of the general people attending the setting was high but the study shows that there is no significant association between use of social media and knowledge of public regarding prevention of novel corona virus. Therefore more measures has to be implemented at government level to improve the knowledge.

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Review Article

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Norovirus Infection

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Abstract

Norovirus infection is a contagious virus that causes vomiting and diarrhoea. The most common symptoms of norovirus include diarrhoea, nausea, vomiting and stomach pain. Other symptoms are fever, headache and body aches. The disease is present across the world, recently cases reported from southern most part of India. The virus and multiplies in small intestine and presenting with gastrointestinal symptoms. The diagnostic measures are Real-Time RT-PCR Assay, Enzyme Immunoassays and Genotyping. Prevention and containment include mainlining the hygieneof food, fluid and practising hand hygiene.

Keywords: Norovirus; Review.

Introduction

The whole world is under the threat of COVID pandemic its first and second wave and uncertainty about the omicron variant. This resulted in people looking at every viral infection with fear and anxiety. Recent reporting of Noro Virus infection in Kerala also resulted in hue and cry among the people. Norovirus infection is also called ad winter vomiting flu or stomach flu, though it has no association with influenza virus. It is very contagious virus that causes vomiting and diarrhoea. The most common symptoms of norovirusinclude diarrhoea, nausea vomiting and stomach pain. Other symptoms are fever, headache and body aches.[1]

Epidemiology

The burden of the disease

Centre for Disease reports that worldwide, one out of every five cases of acute gastroenteritis are caused by norovirus.[2] Its most common among children under the age of five years and causing an estimated number of 50,000 child deaths every year. The disease strike mostly in developing countries but it is a problem in low and high income countries. It cost $60 billion worldwide due to healthcare costs and lost productivity.

Agent

Noroviruses were initially called as Norwalk viruses which caused an outbreak of gastroenteritis in a school in Norwalk, Ohio in 1968. Noroviruses (NoV) is a positive-sense RNA, non enveloped viruses belonging to the family Caliciviridae.[3] Noroviruses has seven genogroups (GI, GII, GIII, GIV, GV, GVI, and GVII). Most noroviruses that infect humans belong to genogroups GI and GII. (31) Noroviruses from genogroup II, genotype 4 (abbreviated as GII.4) account for the majority of

adult outbreaks of gastroenteritis and often sweep across the globe.[4]

Host

People of all ages can get infected and sick with norovirus.

Environmental

There is seasonality in the norovirus infection. The incidence is higher in November to April in countries located above the equator, and from May to September in countries below the equator. The places closer to the equator, norovirus may be less seasonal.

Source of Infection and Infective Material

The virus is present in the saliva and excreta of the infected individual. Norovirus spreads through contaminated food and fluid. A very small amount of virus particle id sufficient to initiate infection.

Pathophysiology and Clinical Manifestations

Through the food and fluids virus enters the gastro intestinal tract and multiplies in small intestine. The gastrointestinal symptoms are prominent with loss of taste nausea, forceful vomiting, watery diarrhoea, and abdominal pain. The symptoms develop between 12 and 48 hours after exposure, and it will last for 1 to 3 days. In some cases there will be weakness, muscle aches, headache, cough, or low-grade fever. Severe illness is rare. The cause of death is fluid and electrolyte imbalance especially among young children. The signs of dehydration can be decrease in urination, dry mouth and throat and feeling unusually sleepy or fussy.[5]

Diagnostic Methods

Diagnostic methods include EIA such as ELISA, reverse transcriptase PCR, and nucleic acid sequence based amplification (NASBA) tests and human faecal specimens.

Real-Time RT-PCR Assay

Diagnostic methods for norovirus focus on detecting viral RNA (genetic material) or viral antigen. Now these tests are available at all clinical and public health laboratories, and most use reverse transcription real time polymerase chain reaction (RT-qPCR) assays to detect norovirus. [2]Taq Man-based RT-qPCR assays are the preferred method to detect the RNA of the virus as these are very sensitive and specific and also provide estimates of viral load. This can be used to test stool, vomitus, food, water, and environmental specimens for norovirus and different oligonucleotide primer sets are used to detect genogroup I, genogroup II, genogroup VIII and GIX noroviruses.[6] The extreme analytic sensitivity of RT-qPCR permits the detection of very low titers of virus that might be present in samples from persons without disease caused by norovirus infection ie, asymptomatic cases.[7]

Enzyme Immunoassays

Rapid commercial enzyme immunoassays (EIAs) can detect norovirus antigen in stool samples but have poor sensitivity (50 to 75%) and are not recommended for testing single samples from sporadic cases of gastroenteritis. These assays can be used for preliminary identification of norovirus when testing multiple specimens during outbreaks. However, samples that test negative should be confirmed by a second technique, such as RT-qPCR.[8,9,10,11,12] EIA kits with high specificity (>85%) and at least moderate sensitivity (>50%) might be useful for preliminary screening of multiple faecal samples associated with an outbreak of acute gastroenteritis.[13]

Genotyping

Genetic characterization of noro viruses detected in stool and environmental samples can be very useful in epidemiologic investigations by linking cases, identifying a common source or new emerging virus strains. Norovirus can be genotyped by sequence analysis of a RT-PCR product amplified from a partial region of both the polymerase gene (region B) and capsid gene (region C) in a single reaction for either genogroup I or genogroup II viruses. All laboratories participating in CaliciNet, a national laboratory surveillance network for norovirus outbreaks is coordinated by CDC.[6]

Stool specimen

Whole stool specimens should be collected for laboratory diagnosis of norovirus and are preferred over rectal swabs because of the higher quantity of virus present in whole stool. Specimen collection for norovirus testing should begin as early as possible in an epidemiologic investigation. Ideally, whole stool specimens should be collected during the acute phase of illness ie, within 48–72 hours after onset, if this is not possible, specimens

collected later in illness or after resolution ie, up to 7–10 days after onset will also helps to diagnose and confirm norovirus infection in a suspected source case patient like food handler with a recent history of diarrhoea. Obtaining a collection of high quality diagnostic specimens is crucial for laboratory confirmation. Whole stool specimens from at least five ill persons are recommended. If specimens are taken after the acute phase of illness, the number should be increased. On the basis of test characteristics of commercially available EIAs, six specimens are required to achieve >90% sensitivity in outbreak diagnosis.[14,15] Whole stool specimens should be kept refrigerated at 39° F (4° C) if testing occurs within 2–3 weeks and while transporting to a laboratory, it should be individually bagged and sealed and kept on ice or frozen refrigerant packs in an insulated water proof container. If testing is expected to occur more than 3 weeks after collection, then stool samples should be frozen at -4° F (-20° C) or -94° F (-70° C).[16] Stool specimens should be collected as early as possible during a suspected norovirus gastroenteritis outbreak and ideally from individuals during the acute phase of illness preferably within 2-3 days of onset.[17]

Vomitus

Specimens of vomitus can be collected to supplement the diagnostic yield from stool specimens during an investigation. Collection, storage, and transportation of vomitus specimens are the same as those for stool specimens.[13]

Serum

Serum specimens are useful duringacute and convalescent phases. Serum specimens may be obtained to test for a greater thanfourfold rise in IgG titre to noroviruses. Acute phase specimens should be obtained during the first 5 days after symptom onset and the convalescent phase specimens should be collected during the third to fourth week after resolution of symptoms.[13]

Environmental Specimens

RT-qPCR test enables detection of norovirus RNA in water, food, and environmental specimens however, validated methods are available only for water (at CDC) and shellfish (at FDA's Gulf Coast Seafood Laboratory). If a food or a water source is strongly suspected as the source of an outbreak, a sample should be obtained as early as possible with respect to the time of exposure and preferably stored frozen at -4° F (-20° C), and CDC or FDA should be contacted for further guidance on testing. Water can be tested for noroviruses after concentration of large volumes (e.g., up to 100 L of water) through specially designed filters.[17] Environmental surface swabs have also been demonstrated to detect norovirus RNA in specific outbreak settings.[18,19] In case of anydelay in obtaining laboratory results, use Kaplan's clinical and epidemiologic criteria to identify a norovirus gastroenteritis outbreak.[21]

Kaplan's Criteria

- Vomiting in more than half of symptomatic cases.
- Mean (or median) incubation period of 24 to 48 hours.
- Mean (or median) duration of illness of 12 to 60 hours.
- No bacterial pathogen isolated in stool culture.

Prevention and Control

There is no specific medicine to treat people with norovirus illness and only symptomatic treatment is available.[1] Hand hygiene is the single most important method to prevent norovirus infection and control its transmission. Thorough hand washing with running water and plain or antiseptic soap reduces the number of microbes on hands via mechanical removal of loosely adherent microorganisms.[20]

Prevention and Containment of Outbreaks

Considering the highly infectious nature of norovirus, exclusion and isolation of infected persons are very important to prevent transmission of virus and limiting contamination of the environment particularly in settings where people reside in long term care facilities, acute care hospitals, cruise ships and college dormitories. The principle of isolation is to minimize contact with persons during the most infectious periods of their illness includes the acute phase of illness period following recovery usually 24–72 hours and potentially incubating persons.[22] The best prevention is the containment of the infection which can be attained by practicing the following measures especially in health care setting. Some of the recommendations are:

- Isolation or cohorting precautions for outbreaks among infants and young children under 2 years should be extended even after

resolution of symptoms and for infants it can be extended up to 5 days.

- Cleaning and disinfection of frequently touched environmental surfaces and equipmentslike commodes, toilets, hand/ bedrailing, telephones, door handles, computer equipment, and other surfaces along with cohorted areas and high-traffic clinical areas. Sodium hypochlorite solutions are widely recommended for disinfection.
- Promote hand hygiene practices among health personnel by using soap and water or ethanol based hand sanitizers especially while caring patients in the affected area.
- Surgical mask and eye protection or a full-faceshield are recommended in case of caring patients with vomiting.
- Refrain ill personnel from work for a minimum period of 48 hours after the resolution of symptoms.
- Cohorting patients during outbreaks may include placing patients in multi occupancy rooms and minimize patient movements within a ward or unit.
- Restrict symptomatic and recovering patients from leaving the patient care area and avoid social gatherings.
- Establish visitor policies for acute norovirus outbreaks and provide education to staff, patients, and visitors regarding symptoms, prevention of infection, and modes of transmission throughout outbreak.
- When a cluster of acute gastroenteritis cases is detected in the healthcare facility active case finding should be initiated and collect relevant epidemiological, clinical, and demographic data along with information on patient location and outcomes.
- If an outbreak is suspected, notification should be done to local and state health departments and include stakeholders such as clinical staff, environmental services, laboratory and healthcare facility administration, public affairs for the development of policy framework.[21]

National Outbreak Reporting System

This surveillance program monitors the reporting of foodborne, waterborne, enteric person to person, and animal contact associated disease outbreaks to CDC by state and other territorial public health agencies. This system was previously used only for reporting food borne disease outbreaks, but now expanded to include all other enteric outbreaks, regardless of mode of transmission. Furthermore, CDC is currently implementing a national surveillance system (CaliciNet) for genetic sequences of noroviruses which may also be used to measure changes in the epidemiology of healthcare associated norovirus infections.[23]

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[9] National Statistics Online—Trends in suicide by method in England and Wales, 1979-2001. www.statistics.gov.uk/downloads/theme_health/HSQ20.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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