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A Study on Laboratory Profile of Patients with Viral Illness (Influenza Like)

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Abstract

Introduction: Influenza-like illness (ILI) is defined by the CDC as fever (temperature ≥100°F or 37.8°C) and either cough or sore throat in the absence of another known cause. *Methodology:* The patients with clinical features of Influenza like illness were enrolled. A complete clinical examination was carried out and relevant investigations done and documented in the proforma. *Results:* Fever was the most common symptom and was seen in all cases (100%), followed by cough (94.3), sore throat (74.3%), nasal catarrh (22.9%), difficulty in breathing (8.6%), vomiting (11.4%), diarrhea(2.8%). *Conclusion:* The clinical manifestations of influenza A H1N1 virus infection range from self- limited uncomplicated subfebrile respiratory illness to severe and even fatal respiratory disease and extrapulmonary disease. Gastrointestinal symptoms include vomiting, diarrhea and abdominal pain.

Keywords: Influenza; Laboratory Profile; Clinical Manfestations.

Introduction

The first case of the flu in India was found on the Hyderabad airport on 13th May 2009.As of 24th may 2010, 10193 cases of swine flu have been confirmed with 1035 deaths [1].

In India the state of Maharashtra is the worst affected followed by Karnataka. As of 8th august 2010 in Karnataka a total of 2899 confirmed cases and 198 deaths have been reported. It is difficult to estimate precisely the number of people infected by the H1N1 viruses as many may not have developed symptoms while others with mild illness may not have sought medical care [2].

Influenza-like illness (ILI) is defined by the CDC as fever (temperature ≥100°F or 37.8°C) and either cough or sore throat in the absence of another known cause. A confirmed case of 2009 H1N1 infection is defined by ILI with positive test results for the 2009 H1N1 virus by either realtime reverse transcriptase polymerase chain reaction (rRT- PCR)or viral culture. A probable case is ILI with positive influenza A test results but negative results for seasonal H1 and H3 by rRT-PCR. A suspected case does not meet either definition but is either a person younger than 65 years hospitalized for ILI or a person of any age with ILI and an epidemiological link to a confirmed or probable case within 7 days of illness onset [3].

Laboratory findings at presentation in patients with severe disease typically include normal or low-normal leukocyte counts with lymphocytopenia and elevations in levels of serum aminotransferases, lactate dehydrogenase, creatinekinase, andcreatinine. Myositis and rhabdomyolysis have occurred in severe cases. A poor prognosis is associated with increased levels of creatine kinase, creatinine, and perhaps lactate dehydrogenase, as well as with the presence of thrombocytopenia and metabolic acidosis [4].

Methodology

The patients with clinical features of Influenza like illness were enrolled. A complete clinical examination was carried out and relevant investigations done and documented in the proforma.

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Inclusion Criteria

Proved cases of influenza A H1N1 and negative cases, where no other specific diagnoses were clinched.

Exclusion Criteria

All other Influenza like illness patients where specific diagnosis other than influenza A H1N1 was clinched were excluded from the study group.

Results

Age of the patients ranged from 1month to 75 years and majority of the caseswere in the age range of 16-30yrs. Mean age was 32.72yrs.

Fever was the most common symptom and was seen in all cases (100%), followed by cough (94.3),sore throat(74.3%), nasal catarrh (22.9%),difficulty in breathing (8.6%), vomiting (11.4%), diarrhea(2.8%). The clinical manifestations favour the diagnosis of influenza A H1N1 but the rRT- PCR was negative for H1N1 in these cases.

Hematocrit values ranged from 17.1% to 43.3%. Majority of the patients had their hematocrit in the range of 36-42 %. The mean hematocrit value was 40.65%.

Table 1: Age wise distribution of negative cases

Age range in yrs	Number of cases	Percentage of cases
1-15	06	17.1
16-30	13	37.1
31-45	08	22.9
46-60	06	17.1
61-75	02	5.8
total	35	100

Table 2: Clinical features of negative case

Symptom	Number of cases	Percentage
Fever	35	100
Cough	33	94.3
Sore throat	26	74.3
Nasal catarrh	8	22.9
Difficulty in breathing	3	8.6
Vomiting	4	11.4
Diarrhea	1	2.8

Table 3: Haematocrit values of negative cases(36%-50%)

HCT	Number of cases	Percentage
<24	1	2.9
24-30	1	2.9
30-36	6	17.1
36-42	21	60
42-48	6	17.1
Total	**35**	**100**

Table 4: Total Leucocyte count values of negative cases(4-11 $\times 10^3/mm^3$)

TLC(10^3/cumm)	Number of cases	Percentage
<4	4	11.4
4-8	15	42.9
8-12	9	25.7
12-16	4	11.4
16-20	3	8.6
Total	**35**	**100**

Mean Corpuscular Volume (78-98fl)

MCV values ranged from 68fl-92fl. Mean value of MCV was 84.14 fl. Majority of patients had MCV within normal range.

Mean Corpuscular Hemoglobin(27-32pg)

MCH values ranged from 24.2 pg-32.6 pg. Mean value of MCH was 27.86 pg. Majority of cases had values within normal range.

Mean Corpuscular Hemoglobin Concentration (32-36 g/dl)

MCHC values ranged from 28.2-35.8 g/dl. Mean value was 32.2g/dl. Majority of cases had values within normal range.

Red Blood Cell Count

The RBC count ranged from 1.5- 6.2 x10v / mm³.Normal value (3.80-5.8 x10v /mm³). Mean value was 4.69x10v /mm³.

Red Cell Distribution Width

The RDW ranged from 10.9-14.9%. Normal values(10.0 – 15.0%). Mean value was 13.04%

Total Leucocyte count ranged from 2.6 $\times 10^3$ to 19.8 $\times 10^3$/ mm^3. Majority of the patients had their count in the range of 4×10^3 -8 $\times 10^3/mm^3$. Mean leucocyte count was 8.58 $\times 10^3/mm^3$. Referring to the normal values for the age, 4 cases had leucopenia and 8 cases had leucocytosis.

Lymphocyte percentage ranged from 6.2%-42.8%. Mean lymphocyte percentage was 25.73%

Table 5: Relative Lymphocyte count values in negative cases(20-45%)

Lymphocyte %	Number of cases	Percentage
<20	6	17.1
20-30	18	51.4
30-40	10	28.6
>40	1	2.9
Total	**35**	**100**

Table 6: Absolute Lymphocyte count values of negative cases(1-3.5$\times 10^3/mm^3$)

Lymphocyte	Number of cases	Percentage
<1	8	22.9
1-2	8	22.9
2-3	12	34.2
>3	7	20
Total	**35**	**100**

Table 7: Platelet count values of negative cases(150-450 $\times 10^3$/cumm)

Platelet	Number of cases	Percentage
<150	2	5.7
150-250	29	82.9
250-350	2	5.7
>350	2	5.7
Total	**65**	**100**

Table 8: Age comparison study of negative cases

Study	Age range	No of cases	Percentage
Zarogoulidis P et Al[5] n =60	16-86	27	45
Present n=100 study	.08-75	35	35

Table 9: Comparison of Hemoglobin values of negative cases

Study	Mean Hemoglobin value (g/dl)
Chan WL et al[6](2011)	13.7
Present study	12.6

Table 10: Comparison of Total leucocyte count of negative cases

Study	Mean TLC (× 10^3/ mm^3)
Chan WL et al[6](2011)	7.2
Zargoulidis et al[5](2011)	12.8
Present study	8.6

Table 11: Platelet comparative study of negative cases

Study	Mean platelet count(10^3/dl)
Chan WL et al[6](2011)	207
Present study	197.9

Lymphocyte count ranged from 0.4×10^3-7.2×10^3/ mm^3. Mean lymphocyte percentage was 2.24×10^3/ mm^3. With reference to normal values for the age 8 cases had lymphopenia.

Relative Granulocyte Count

Granulocyte percentage ranged from 53%-91.3%. Normal values 40-70%. Mean granulocyte percentage was 69.3%

Absolute Granulocyte Count

Granulocyte count ranged from 1.8×10^3-14.1×10^3/ mm^3.Normal values $1.5\text{-}7.0\times10^3/mm^3$. Mean granulocyte count was $5.92\times10^3/mm^3$.

Relative Monocyte Count

Monocyte percentage ranged from 2-10.4%. Normal values 2-10%.Mean monocyte percentage was 4.6%

Absolute Monocyte Count

Monocyte count ranged from $0.1\text{-}1.7\times10^3/mm^3$. Normal values $0.2\text{-}1.0\times10^3/mm^3$. Mean monocyte count was $0.58\times10^3/mm^3$.

Liver function tests were done in 4 cases. All cases had their bilirubin and protein levels within normal range. One case had elevated SGOT levels, and one case had elevated ALP levels.

Serum electrolytes like serum sodium and serum potassium were done in 3 cases. No abnormalities seen.

Discussion

In a study done by Zargoulidiset al [5] 27 cases were Influenza A H1N1 negative and the age range of the cases was 16yrs to 86 yrs

In our study 35 cases were Influenza A H1N1 negative and the age range was 8 months to 75 yrs.

In our study mean hemoglobin value was 12.6g/dl when compared to 13.7g/dl in study done by Chan et al [6] in Singapore.

The mean leucocyte count in our study was 8.6×10^3/ mm^3, similarly the mean leucocyte count in a study done by Chan et al [7] was within normal range 7.2×10^3/ mm^3 but the mean leucocyte count in a study done by Zargoulidis et al[8] was slightly elevated 12.8×10^3/ mm.

Comparison of Absolute Lymphocyte Count

In our study 22.9% had lymphopenia while 16% cases had lymphopenia in a study done at Singapore by Onget al [7].

In our study the mean platelet count was 197.8 $\times10^3$/dl when compared to 207×10^3/dl in study done by Chan et al [6] Thrombocytopenia was seen in 2 cases in our study.

Conclusion

Influenza A/ H1N1, like seasonal influenza, is more likely to cause serious illness in individuals at risk with underlying chronic illness or in those who are in the paediatric age group or pregnant women. Public health efforts should focus on providing appropriate support and preventive services, including vaccination, to these groups.

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