

A descriptive study of seasonal influenza cases in a single season in a tertiary center in Kathmandu

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ABSTRACT

Introduction:

This is a clinic-epidemiological study of the total cases of polymerase chain reaction (PCR) confirmed influenza cases. We aim to characterize the disease, its morbidities and mortality.

Materials and Methods:

The details of all PCR confirmed influenza (H1N1) cases were obtained from the hospital records and descriptive statistical analysis tools were used to report the findings.

Results:

A total of 35 cases were confirmed as influenza from January to March 2019. The most common presenting complaints were fever (91%), cough (85%) and shortness of breath (65%). The most frequent diagnosis made was pneumonia (88%). Septic shock was present in 29% while 14% had acute kidney injury (AKI). Oxygen therapy was required in 71% with 17% requiring mechanical ventilation and another 11% requiring non-invasive ventilation. Fourteen percent had developed severe acute respiratory distress syndrome (ARDS) requiring proning. A total of 77% patients were successfully discharged home, 8% were transferred to other centers on request for various reasons and 11% were withdrawn from all active treatment leading to death. One patient was taken home against advice whose outcome could not be traced. During treatment, two patients had developed ischemic stroke, two required haemodialysis for acute renal failure and other two had scrub typhus co-infection.

Conclusions:

A total of 85% of the patient survived while the rest lost their lives. The most important factor recognized was the financial burden associated with the treatment. Diagnostic delays and limited supply of Oseltamivir might be the other barriers in the treatment of the disease.

Key words: ARDS, Influenza, Ischemic stroke, PCR, Scrub typhus.

Introduction

Influenza or LaGrippe has caused global pandemics in various times in the past. The most notable of them has been the pandemic of 1918, 1957, 1968 and 2009 taking millions of lives. The recent pandemic of 2009 had affected a total of 74 countries. An estimated 151,700 to 575,400 people had lost their lives during the pandemic. This was however considered moderate in comparison to the 1918 pandemic with the influenza A virus-subtype H1N1 which had killed almost a third of the then world population^{1,2}. However, there are outbreaks of “seasonal flu” every year with concerns for another pandemic in the world. The World Health Organization (WHO) has thus launched a Global Influenza Strategy (2019-2030) against this potential threat³. The differences in the viral characteristics during these outbreaks and pandemics lead to the unique differences in the presentation, the patient population affected and the outcomes^{4,5}.

Two peaks are seen in the annual distribution of influenza in Nepal. First is during the months of January to March and the second peak in the months of August to October³. The classical viral prodrome has been often linked to seasonal influenza including high grade fever, generalized body ache, sore throat and running nose. However, the current clinical case definition of influenza like illness (ILI) includes just “an acute respiratory illness with a measured temperature of $\geq 38^{\circ}\text{C}$ and cough, with onset within the past 10 days” and the ‘classical prodrome’ is often not present⁶. Similarly, severe acute respiratory infection (SARI), is defined as “an acute respiratory illness with a history of fever or measured fever of $\geq 38^{\circ}\text{C}$ and cough, with onset

within the past 10 days, requiring hospitalization”. This includes cases with or without radiologically identifiable pneumonia³.

Materials and methods

This is a clinic-epidemiological description of the polymerase chain reaction (PCR) confirmed cases of influenza presenting to a tertiary center, Om Hospital, in the first thirteen weeks of the year - from January to March 2019. This Data was evaluated retrospectively from the hospital medical records.

Results & Discussion

The total number of patients with PCR proven influenza A infection was 35. The mean age was 51.2 years (21-94 years) with 60% males. The week-wise distribution of the cases is shown in figure 1.

The most common chief complaints were fever (91%), cough (85%) and shortness of breath (65%). Other symptoms were generalized bodyache, sore throat, nausea/vomiting, diarrhea and loss of appetite. The mean duration of symptoms at presentation was 7.2 days (range 1-22days).

The most common diagnosis was pneumonia (88%). Shock was present in 22% and 14% had acute kidney injury (AKI). Two patients required hemodialysis for acute renal failure. The majority of patients (71%) required ICU admission and others were managed in isolation ward. The average length of stay in the ICU was 2.89 days (range 1-25days), 1.86 days (range 2-6 days) in the isolation ward and 3.1 days (range 1-12 days) in the general ward. The average length of hospital stay was 8 days (range 2-31 days).

More than 71% of the patients required oxygen therapy. Around 43% required low flow oxygen via like nasal cannula or Venturi mask while 11.4%

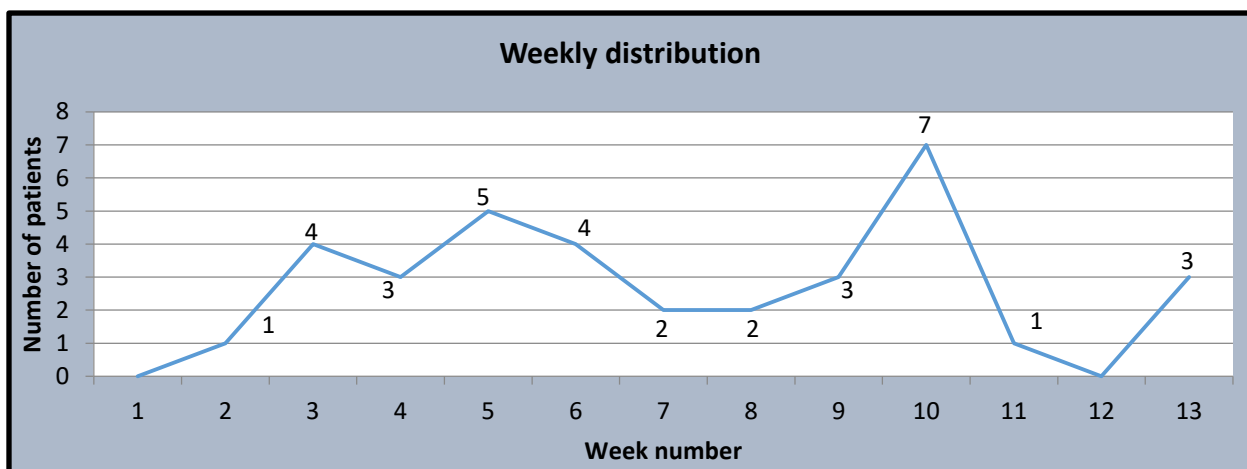


Fig. 1: Weekly distribution of cases

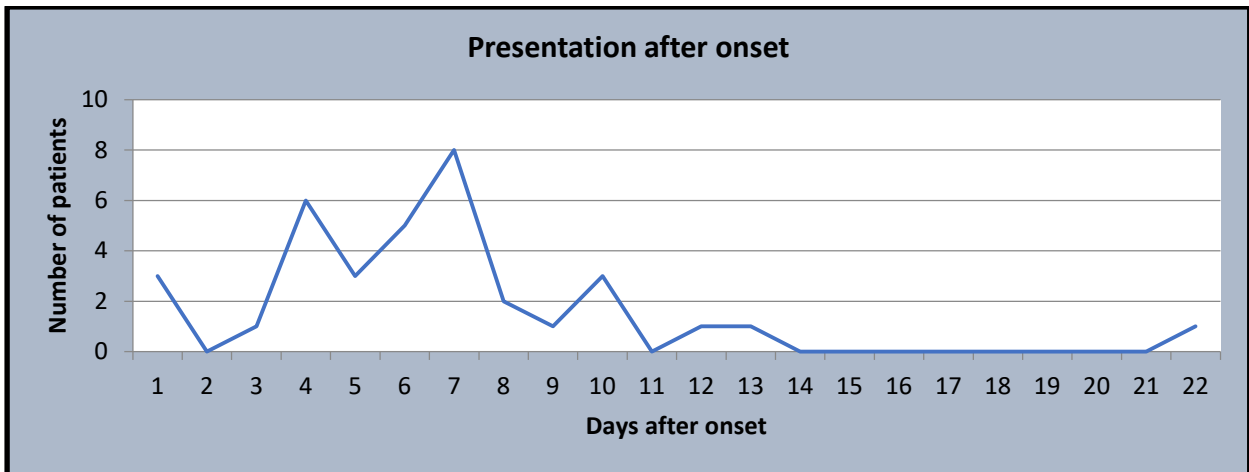


Fig. 2: Presentation to hospital after onset of symptoms

required non-invasive positive pressure ventilation. Six patients needed endotracheal intubation and mechanical ventilation with 5 patients (14%) requiring proning for severe ARDS.

There was no mortality during active treatment. However, in 4 patients (11%) all active life support was withdrawn resulting in death. Three patients had been transferred to other center for various reasons. On inquiring over the telephone, one of these patients had worsened during the course of treatment later requiring endotracheal intubation and had expired due to hypoxia refractory to several sessions of proning. The second patient had been successfully extubated at our centre with the resolution of the hypoxia and was transferred to another centre on request where from the patient was discharged later. The third patient had been intubated and undergone several sessions of

proning. This patient was later airlifted to another center on request where he had to undergo tracheostomy for prolonged mechanical ventilation following ischemic stroke. The patient was later successfully discharged with tracheostomy. One of the patients had left against medical advice under bag and tube ventilation. No information regarding the outcome could be gathered about this patient.

Besides these, another patient who had undergone mechanical ventilation and several sessions of proning had developed ischemic stroke requiring decompressive craniectomy. However the patient was successfully extubated and had good neurological recovery with some residual hemiparesis. Two other patients had concurrent scrub typhus co-infection.

A total of 1492 cases had been reported from Nepal to the WHO during this 13 weeks. Our center

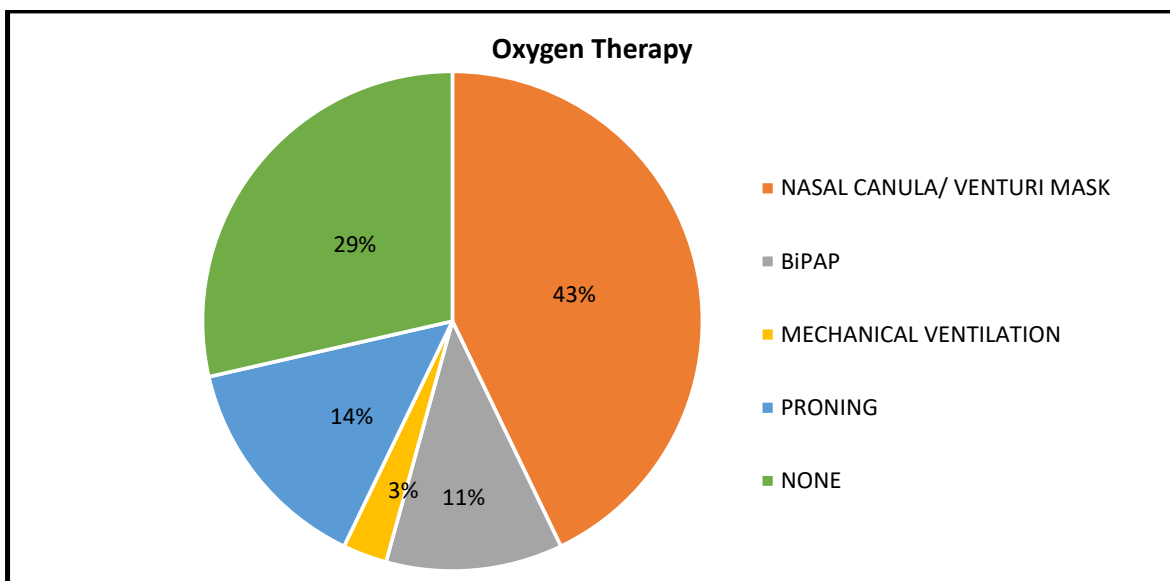


Fig. 3: Modalities of Oxygen therapy required

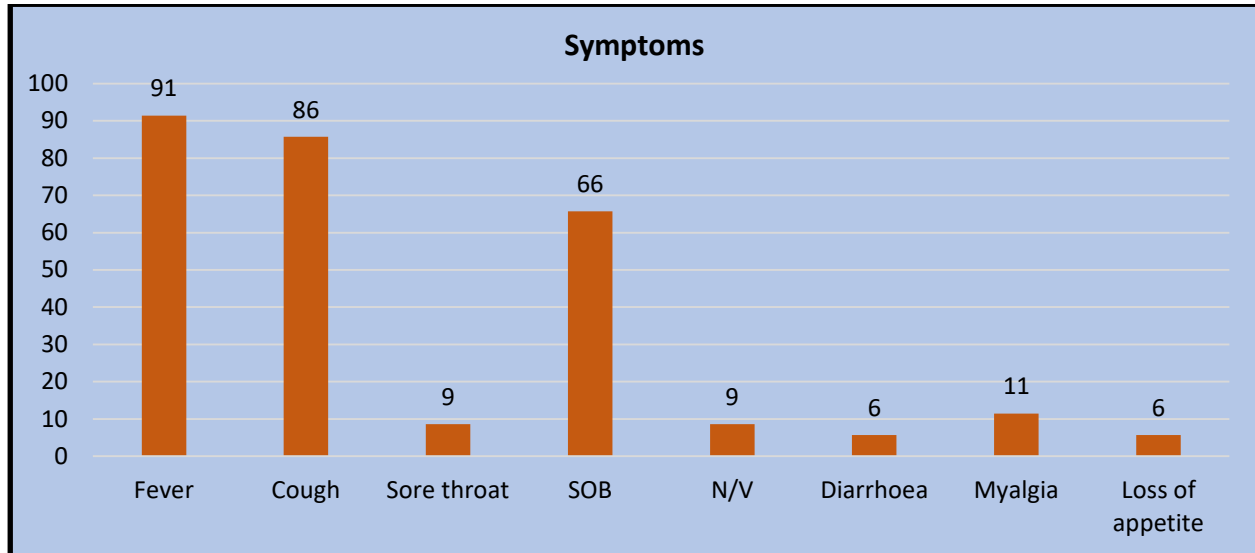


Fig. 4: Symptoms

accounted for 2.34% of the total national burden. Most common complaints of the patient coming to our centre were fever, cough and shortness of breath. Also, very few patients had “sore throat”. This co-relates with the new definition of ILI from which the word “sore throat” has been dropped as this is a very inconsistent finding³.

Identifiable radiological pneumonia was present in most patients. This is because the patients presenting to our center are usually referred cases of SARI after multiple center visits. Also, significant number of people had presented with shock and AKI. Though the mortality rate for ILI is low, it increases during the seasonal outbreaks. Furthermore, SARI has been associated with higher mortality rates and more so in elderly population (>65 years of age)^{1,2,7}. Our description did not have any official mortality during treatment. However, 14% patients did lose their lives due to withdrawal of active treatment by their substitute decision makers. All of these patients were very sick thus accounting for increased costs of treatment. The reason for the withdrawal in all the cases was financial burden. This is because all the treatment costs are borne by the patient’s family themselves as health insurance policy in Nepal has a very low coverage⁸. Even though 14% mortality is a very high, the probable reason for such figure is that our hospital is a tertiary center and most of the cases that we receive are very sick patients who are referred from other smaller centers^{3,9}.

The most common diagnosis in this study was pneumonia. A total of 71% required some form of

oxygen therapy. ARDS was noted in 28% of the cases, half of which were severe as per the Berlin criteria and required proning¹⁰. This is comparable to data from other series^{9,11}. The rarity of extracorporeal membrane membrane oxygenation (ECMO) facilities in Nepal is glaring. Only a couple of centers have been using ECMO for ARDS in the country and that too in a handful of cases. The major limiting factors for this are the unavailability, and more importantly the exorbitant establishing and running costs.

Two of the cases also had co-infection with scrub typhus since the seasonal distribution of scrub typhus and influenza overlap to some extent. This is important since many of the patients, especially the critically ill ones have similar clinical profiles. Both these infections can cause mortalities and thus it is important to consider co-infection requiring simultaneous treatment^{12,13}.

Two of the cases had developed ischemic stroke which represents almost 6% in our series. Influenza has been found to be associated with vasculitis in the central nervous system. It has been established that H1N1 infection increases the release of cytokines triggering and aggravating ischemic stroke. Both the patients had severe acute respiratory illness with severe ARDS requiring proning. This could have further increased the risk of stroke due to the persistently low partial pressures of arterial oxygen. Both these patients survived, though they did develop additional morbidity due to the effects of stroke^{14,15}.

The average duration for the initiation of Oseltamivir after the onset of symptoms was found to be 6.57 days though the efficacy has been found

to be best when used within two days^{16,17}. This large time lag may be due to various factors. Firstly, the patients usually present to our center after multiple referrals. Secondly, the drug having been supplied only by the government is not available freely to be used early for suspected cases in all centers. Furthermore, only a few laboratories are equipped with PCR causing a further delay in diagnosis.

Conclusions

Seasonal influenza has been seen to present with a range of severity from a very mild flu like illness to severe ARDS costing lives. The disease when severe has worse outcomes in our part of the world because of the limited availability of diagnostic and treatment facilities including Oseltamivir and ECMO. Furthermore the cost associated with the treatment of severe form of the disease has grave implications in the treatment of the disease.

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