Brief Communication

Precipitation of new onset diabetes by H1N1 infection

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ABSTRACT

Infectious diseases in type 2 diabetes can complicate diabetic ketoacidosis, derange hyperglycemia, or precipitate new onset diabetes. Pulmonary tuberculosis being the most common. High index of clinical suspicion is required for co-existing H1N1 virus, which if present has high mortality if not treated. A 63-year-old female, with no known chronic illness, was hospitalized in month of Aug 2010 with influenza-like symptoms and diabetes. Quick evaluation revealed tachycardia, tachypnea, p02 90% at room air, and normotensive. Clinical chest examination was normal. Further evaluation revealed NHO in both lung fields on chest X-ray, hyperglycemia 325 mg/dl, detected for first time. Her signs and symptoms were out of proportion to clinical findings and chest X-ray findings. Patient was managed with insulin infusion and empirical broad-spectrum antibiotic coverage in ICU. As her condition worsened over next 12 hrs, infection with H1N1 was suspected and empirically started on oseltamavir after taking throat swab for H1N1 test and later, the sample was tested positive for H1N1 influenza by RT-PCR. Clinical course in the hospital was complicated by oxygen dependence requiring 10-12 ltr/hr by nasal mask. She made an uneventful recovery. In a known diabetic, infection with H1N1 quadruples ICU hospitalization, and only few cases of new onset diabetes with H1N1 were reported. Two reported from Iran had fatal outcome. This case emphasis on clinical acumen in recognition, and prompt institution of therapy will reduce associated mortality.

Key words: Diabetes, H1N1, infections

Introduction

Infectious diseases in type 2 diabetes can complicate diabetic ketoacidosis, derange hyperglycemia, or precipitate new onset diabetes. Among infections, tuberculosis being the most common infectious agent.[1] Novel pandemic influenza virus H1N1[2] strain needs to be kept in mind when dealing with new onset diabetes with co-existing infectious agent, which, if present, is associated with high mortality.

A 63-year-old female, with no known chronic illness, was hospitalized in month of Aug 2010 with fatigue, breathlessness on exertion, productive cough with scanty sputum, and high-grade fever of 04 days duration. Quick emergency assessment had shown temp 101°F, tachycardia, tachypnea, p02: 90% at room air, and normotensive. Clinical chest examination was unremarkable. Further evaluation revealed NHO in both lung fields on chest X-ray, hyperglycemia 325 mg/dl, detected for first time. There was no ketonuria, no leukocytosis. Her symptoms and oxygen desaturation were out of proportion to clinical finding and chest X-ray findings. Patient was managed with insulin infusion and empirical broad-spectrum antibiotic coverage in ICU. As her condition worsened over next 12 hours, infection with novel influenza virus was thought and empirically started on oseltamivir after taking throat swab for H1N1 test and later, the sample was tested positive for H1N1 influenza by RT-PCR [Figures 1 and 2]. Clinical course in the hospital was complicated by oxygen dependence requiring 10-12 ltr/hour of oxygen administration by nasal mask. Oseltamivir was continued for 02 weeks with escalation of antibiotic coverage for any methicillin-resistant *staphylococcus aureus* organisms. Her blood sugar was well controlled with continuous I.V. insulin

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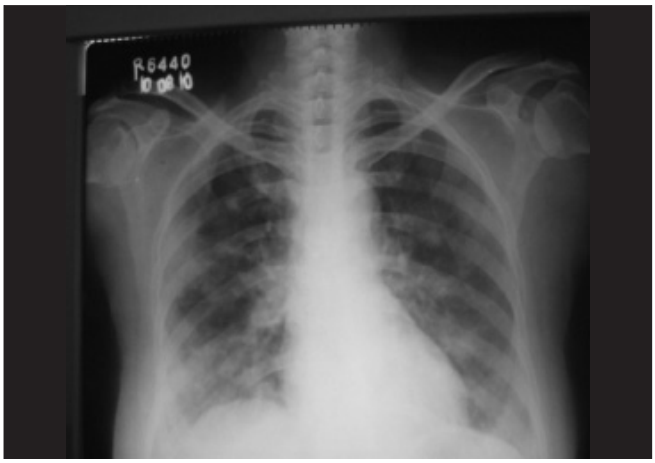

Figure 1: Chest X-ray showing pluffy opacities in both lung fields

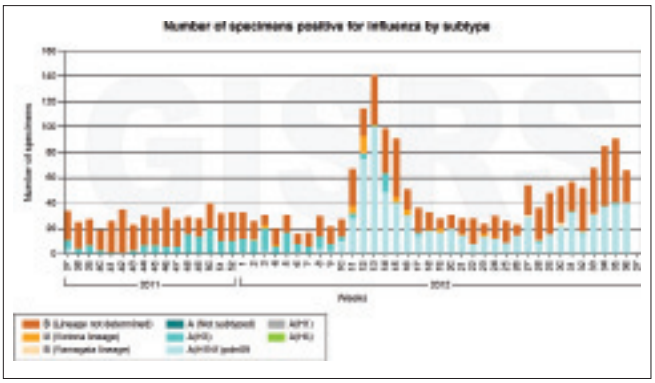

Figure 3: Real time Influenza data in India. [Source: WHO Influenza Laboratory Surveillance Information by the Global Influenza Surveillance and Response System (GISRS). India, Generated on 14/09/2012 06: 14:47 UTC]

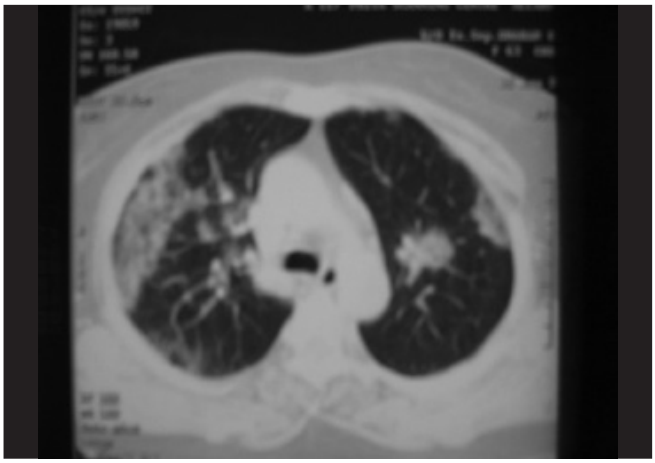

Figure 2: Computed tomography scan chest: Done at 48 hrs of admission, showing confluence of opacities with consolidation

Table 1: Distinguishing clinical features from common Cold and Flu

Common cold	Flu
• Fever rare	• Rapid onset of fever (>38°C)
	• Headache
• Headache rare	• Aching muscles
• General aches slight	• Fatigue
• Sometimes fatigue	• Sore throat -sometimes
• Never extreme exhaustion	• Runny or blocked nose
• Common stuffy nose	• Dry cough–chest discomfort
• Sneezing usual	• Loss of appetite
• Sore throat common	
• Hacking cough	

infusion and gradually changed over to subcutaneous biphasic insulin. Appropriate prophylaxis against H1N1 was given to all nurses and paramedical staff and proper disposal of waste as per WHO guidelines. She made an uneventful recovery and was discharged on biphasic insulin @ 35 units/day with well-controlled blood sugar levels.

The first pandemic of 21st century, witnessed with detection of the first case in Mexico 2009, became evident that human-to-human transmission is caused by novel influenza virus, which is a re-assortment of 4 different strains of influenza virus genes causing novel H1N1 2009 pandemic strain. Though it behaved like seasonal flu virus, the morbidity and mortality were more with risk factors like diabetes, pregnancy, cardiovascular status, obesity; chronic illness suffered more from this pandemic flu. Presently, we are in post-pandemic phase, and there are sporadic cases reported with mortality in high-risk cases [Figure 3]. The non-specific symptoms like fever, running nose, sore throat, body aches in flu make it difficult to identify and isolate cases initially [Table 1]. WHO has listed diabetes as silent-epidemic, which is prevalent worldwide, taking toll of deaths in the age group of 35-65 years; 1 out of 10 deaths are attributed to diabetes, a ratio that increases to 1 out of 4 in certain vulnerable populations. People with diabetes and influenza are 3 times more likely to die from complications than without diabetes. Immunological research from the Hospital Clinico Universitario de Valladolid in Spain and the University Health Network found high levels of a molecule called interleukin 17 in the blood of severe H1N1 patients and low levels in patients with the mild form of the disease. Interleukin 17 can produce inflammation and autoimmune diseases.[3] There were only few reported cases of H1N1 infection precipitating diabetes. Two cases from Iran[4] with precipitation of diabetic ketoacidosis and H1N1 infection had fatal outcome. In a known diabetic, after H1N1 infection, hospitalization is known to triple and quadruple risk of ICU admission once hospitalized.[5] Our case was complicated by precipitation of new onset hyperglycemia and occurrence of pneumonia with rapid decline in general condition. High flow oxygen was required to be delivered by facemask to maintain oxygen saturation. To best of our opinion, there were no reported cases of precipitation of diabetes with influenza

A (H1N1) pdm09 virus with positive outcome from India.

This case lays emphasis on clinical acumen in recognition of a co-existing infectious process in a new onset diabetes mellitus, H1N1 infection, and prompt institution of oseltamivir to retard the progression of disease and decrease the mortality associated with it. Vaccination offers better advantage for diabetes patients

References

1. Restrepo BI, Camerlin AJ, Rahbar MH, Wang W, Restrepo MA, Zarate I, *et al*. Cross-sectional assessment reveals high diabetes prevalence among newly-diagnosed tuberculosis cases. Bull World Health Organ 2011;89:352-9.
2. Clinical management of human infection with new influenza A(H1N1) virus,WHO Initial guidance 2009.
3. Bermejo-Martin JF, Ortiz de Lejarazu R, Pumarola T, Rello J, Almansa R, Ramírez P, *et al*. Th1 and Th17 hypercytokinemia as early host response signature in severe pandemic influenza. Crit Care 2009;13:R201.
4. Moghadami M, Honarvar B, Sabaeian B, Zamiri N, Pourshahid O, Rismanchi M, *et al*. H1N1 influenza infection complicated with diabetic ketoacidosis. Arch Iran Med 2012;15:55-8.
5. Allard R, Leclerc P, Tremblay C, Tannenbaum TN. Diabetes and the severity of pandemic influenza A (H1N1) infection. Diabetes Care 2010;33:1491-3.

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