

# In Dealing with Influenza Infection in Pregnant Women



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## Abstract

Pregnant women are vulnerable to influenza infection. Seasonal flu infection is common and the diagnosis is mainly clinical based. If clinician is not aware of warning symptoms and signs, the seasonal flu infection can lead to serious morbidity and mortality. Therefore, clinician plays an important role to observe and monitor closely and update oneself with the progress of the disease process. Simple interventions like hand hygiene, covers coughs and sneezes with isolation will be helpful to prevent the transmission of the disease.

**Keywords:** Influenza infection in pregnancy

**Abbreviations:** HA: Hemagglutinin; NA: Neuraminidase; URIs: Upper Respiratory Tract Infections; ILI : Influenza-Like Illness; ARDS: Adult Respiratory Distress Syndrome; GISRS: Global Influenza Surveillance and Response System

## Introduction

Influenza (Flu) is a very common infection in general population. It is generally mild and self-recovered infection, however, very few people know the fact that it has a sophisticated assortment in the viral structure (antigenic shift) and its course of the disease itself can result in a tremendously harmful outcome. There were so far 4 pandemic attacks worldwide. Spain in 1918 (unknown strain but suggestive of avian-like H<sub>1</sub>N<sub>1</sub>), Asian flu in 1957 by H<sub>2</sub>N<sub>2</sub>, Hong Kong in 1968 and Mexico in 2009. After all the pandemic attacks, health personnel become more aware of its lethal complications as well as its after-maths. Normally, it occurs as a seasonal flu and as an endemic entity but it gets upgraded into epidemic then pandemic. For a virus, it is a single-stranded, enveloped RNA virus from Orthomyxoviridae family. Its incubation period is 2- 5 days and the transmission is mainly air-borne i.e. droplet inhalation or direct transmission or contact through hands and fomites. There are 4 types of virus (A, B, C and D). The commonest and the most virulent pathogenic group is group A which has well-known subtypes like H<sub>1</sub>N<sub>1</sub> (Swine flu or 2009 Pandemic flu), H<sub>5</sub>N<sub>1</sub> (2004 Avian flu), H<sub>3</sub>N<sub>2</sub> (1968 Hong Kong flu) and others. There are no other

subtypes in group B, C and D. The subtypes are classified based on antibody responses to glycol proteins such as hemagglutinin (HA) and neuraminidase (NA) on the surface of the virus [1]. The clinical presentations are generally headache, fever, dry cough, sneezing, running nose, malaise, muscle ache and pain, sore throat, but one third may be asymptomatic. The cough may persist for about two weeks after other symptoms subside. The symptoms can be overlapped with those caused by other viral upper respiratory tract infections (URIs) including human para influenza virus, adenovirus, enterovirus and paramyxoviruses which will cause influenza-like illness (ILI) [2].

The diagnosis is mainly clinical in most of the seasonal cases but once the illness presents with the following severe symptoms, novel influenza strain should be suspected. The course of the novel infection will last longer than its normal course and its symptoms are refractory to normal symptomatic treatment.

- I. Warning signs for the clinician.
- II. Difficulty breathing or shortness of breath.

- III. Pain or pressure in the chest or abdomen.
- IV. Sudden dizziness.
- V. Confusion.
- VI. Severe or persistent vomiting.
- VII. Flu-like symptoms that improve but then return with fever and worse cough.

The harmful effect is more pronounced in pregnant women, children under 5 years, elderly people, immune-compromised patients, general debility and the patients with underlying respiratory illness especially asthma. The reason for the pregnant women being prone to severe influenza infection is due to physiological changes like increased heart rate, stroke volume and O<sub>2</sub> consumption, decreased lung capacity and a shift away from cell-mediated immunity towards humoral immunity [3]. During the 2009 pandemic flu, 10% of pregnant women were among those admitted to the hospital in Florida, USA [4]. Even in seasonal outbreak, pregnant women are found to be affected more than non-pregnant adult women in terms of morbidities like an increase in hospital admission, increased admission to ICU and long-term hospital stays. Diagnostic test recommended is reverse

transcription polymerase chain reaction (RT-PCR) test and viral culture [5]. A rapid influenza antigen test (RIATs) is another one-stop useful test in our clinical practice and its use is agreed by CDC although the sensitivity is 40-69% [6]. The specimens collectable are from nasal swabs, nasopharyngeal swabs, throat swabs, endotracheal tube aspirates and broncho pulmonary secretions from lavage.

The complications are higher with advancing pregnancy even result in maternal death. The severity depends on obstetric risk factors like pre-eclampsia, multiple pregnancy., independent risk factors like obesity, smoking and medical illnesses like asthma, autoimmune disease. While looking through in all reachable case-series and case reports, there were variable severities like pneumonia, myocarditis, encephalitis and myositis with multi-organ failure (ARDS-adult respiratory distress syndrome) from sepsis leading to mortality. Effects on the pregnancy include non-reassuring fetal testing (mostly fetal tachycardia) and febrile morbidity. There are theoretical risks of congenital anomalies and neural tube defect in early pregnancy associated with hyperthermia 5. There are evidences that pregnant women can develop miscarriage with premature rupture of membrane from CDC report 7.

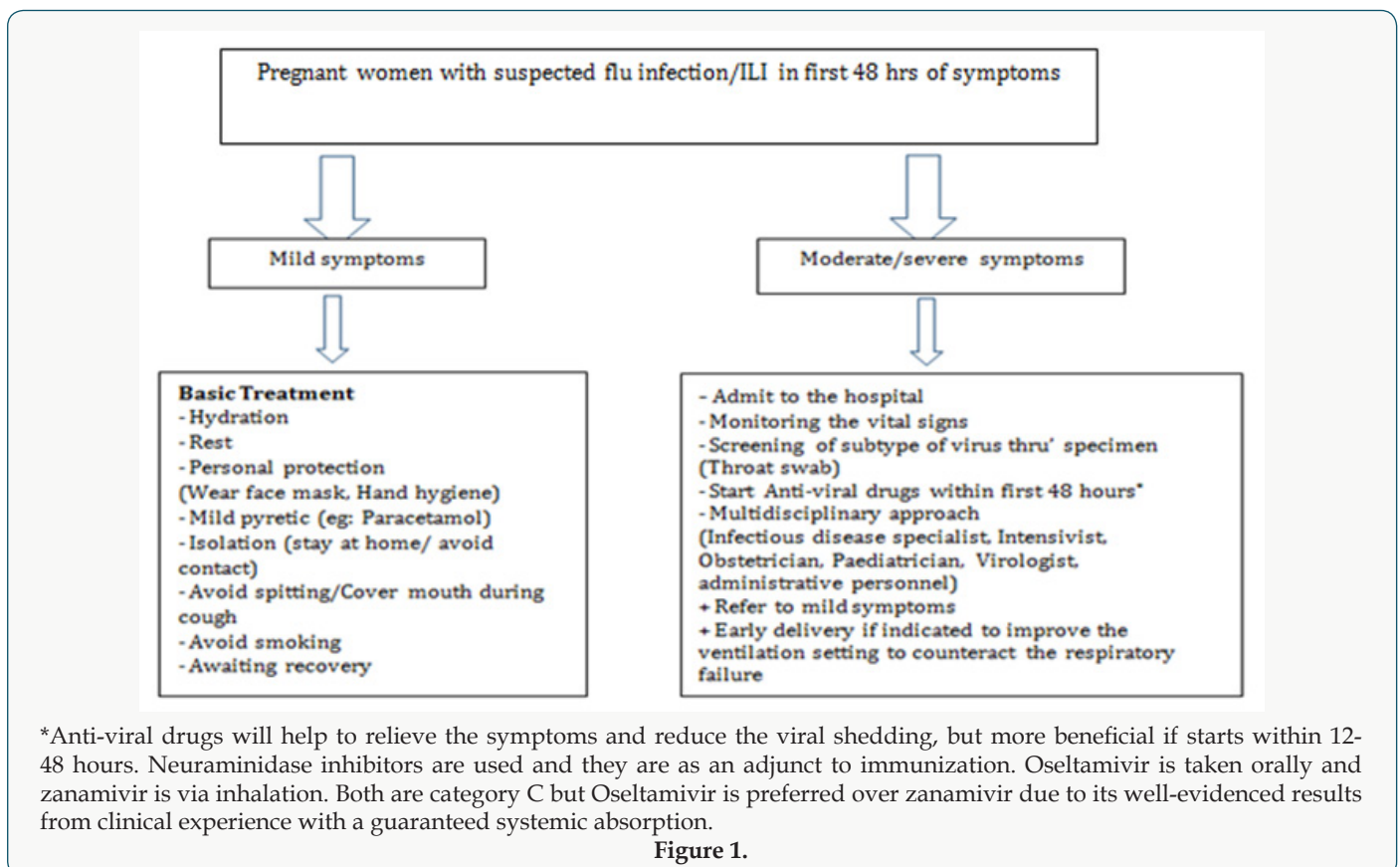


Figure 1.

The treatment is mainly symptomatic but, at the same time, the woman needs to be closely monitored whether the symptoms are subsided or become more serious. Life style changes like avoid smoking with personal hygiene are considered as important

measures to prevent the transmission. The women should take vivid amount of water and should be isolated from others. Surveillance on the appearance of new symptoms as well as progress of current condition is necessary during isolation period. Personal protection


measures like avoid touching the eyes, nose or mouth; proper hand hygiene with soap and water, or with alcohol-based hand rubs, covering coughs and sneezes; avoiding close contact with sick people; and staying home during the illness will be helpful. Wearing of face mask is recommended. (Figure 1) and (Table 1) Immunization is recommended to pregnant women especially during flu season (November-March). Macdonald stated that they are low-cost interventions that have been shown to have substantial benefits for both mother and baby [8]. During 2016-17 flu seasons, an estimated 50% of pregnant women in the US were vaccinated [7]. Globally, World Health Organisation recommends the surveillance

**Table: 1.**

Drug	Treatment	Chemoprophylaxis
Oseltamivir	75 mg twice a day for 5 days	75 mg once a day for 10 days
Zanamivir	Two 5 mg inhalations twice per day for 5 days	Two 5 mg inhalations daily for 10 days
Peramivir	One time intravenously over 15-30 mins	

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