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Influenza and Pneumonia in Pregnancy

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Influenza is a significant cause of morbidity and mortality from febrile respiratory illness worldwide. Influenza in pregnant women has historically been associated with a higher rate of morbidity and mortality. Pneumonia is the sixth leading cause of death in the United States, and it is the number one cause of death from an infectious disease. Although pregnant women do not get pneumonia more often than nonpregnant women, it can result in greater morbidity and mortality because of the physiologic adaptations of pregnancy. Pregnant patients who have either of these conditions require a higher level of surveillance and intervention.

Influenza

Influenza is caused by two RNA viruses in the family Orthomyxoviridae, influenza A and influenza B. First identified in 1933, they remain a significant cause of morbidity and mortality from febrile respiratory illness worldwide [1]. Influenza A is subtyped using two surface antigens: hemagglutinin (H) and neuraminidase (N). Both viruses are further grouped based on antigenic characteristics. Antigenic drift, the yearly variation in the surface antigens caused by point mutations, results in the need for annual revaccination. Because immunity to surface antigens reduces the chance of becoming infected as well as the severity of symptoms if infected [2], vaccines are developed with subtle alterations each year in anticipation of viral variation. Antigenic shift, seen only in influenza A, occurs when mutations accumulate in the N or H antigens, replacing

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the current antigen with a new subtype. The years associated with antigenic shift report much higher morbidity and mortality rates. Between 1990 and 1999, influenza caused an average of 36,000 deaths per year [3]. The H3N2 strain of influenza A has caused the most hospitalizations during epidemic years since 1968, at approximately 142,000 per year [4]. A patient's response to influenza is multifactorial and cannot be predicted based on viral properties alone [5]. It is this uncertainty that has continued to make influenza a formidable opponent.

Historical perspective

Influenza in pregnant women has historically been associated with a higher rate of morbidity and mortality. The course of influenza in pregnancy was first reported during the epidemic of 1918, when 1350 cases in pregnant women who had an influenza-like illness were evaluated. Pneumonia complicated 585 (43%) of the cases. In 52% of these patients, the pregnancy was interrupted. There were 308 (23%) maternal deaths. Mortality was highest in the last 3 months of pregnancy, and increased if complicated by pneumonia [6]. During the influenza epidemic of 1957, 22 pregnant women in New York City died from complications of the flu. Pregnant women accounted for nearly half the deaths of women of childbearing age [7]. During the same epidemic, 11 pregnant women died in Minnesota. All deaths were attributed to respiratory insufficiency secondary to pulmonary edema and pneumonia [8]. Mullooly and colleagues [9] reviewed influenza complicating pregnancy from 1975 to 1979. There were four epidemics in that 5-year time period. Pregnant women sought outpatient medical attention for acute respiratory disease during the influenza season significantly more often than nonpregnant women; however, unlike the previously reported epidemics, there were no maternal deaths attributable to influenza, and the hospitalization rate was low at 2 per 1000.

Risk factors

It is recommended that high-risk groups be vaccinated annually, because the severity of the season will only be known in retrospect. High-risk groups include children aged 6 to 23 months; people aged 65 or older; residents of long-term care facilities; adults and children who have chronic illnesses, including asthma, diabetes, and immunosuppression; and pregnant women. In 2000, 73 million people in the United States were considered high-risk [4]. Unfortunately, up to 50% of these high-risk patients do not receive annual vaccination.

Pregnant women are felt to be at increased risk for influenza. This risk is higher if they have an underlying medical condition, are of advanced age, or are exposed in the third trimester [10]. In a study by Neuzil and coworkers [10], women in the third trimester were three to four times more likely than postpartum women to be hospitalized for an acute cardiopulmonary illness during influenza season. Asthma in pregnant women increased the rate of hospitalizations for a respiratory illness during influenza season 10-fold [11].