Available online at www.sciencedirect.com

SciVerse ScienceDirect

Taiwanese Journal of Obstetrics & Gynecology 51 (2012) 83–85

www.tjog-online.com

Case Report

Severe 2009 H1N1 infection in early pregnancy

Guang-Qiong Hou [a], Yiu-Tai Li [a], Chih-Hsing Lin [a,*], Tsung-Cheng Kuo [a], Shu-Jou Tasi [b], Chun-Shui Huang [c]

[a] *Department of Obstetrics and Gynecology, Kuo General Hospital, Tainan, Taiwan*
[b] *Department of Nursing, Kuo General Hospital, Tainan, Taiwan*
[c] *Department of Laboratory Medicine, Kuo General Hospital, Tainan, Taiwan*

Accepted 1 February 2011

Abstract

Objective: Because pregnancy suppresses the immune system, women at any stage of pregnancy are more susceptible to bacterial and viral infection. Pregnant women might thus be at increased risk of complications from pandemic H1N1 virus infection, and illness may progress rapidly.
Case Report: A 23-year-old primigravida at 9 weeks' gestation was presented to our institution because of the sudden onset of sore throat, fever, chills, and vomiting for 5 days. She was diagnosed with early pregnancy H1N1 infection, vulvar herpes infection, and impending intravascular disseminated coagulopathy. Oseltamivir (Tamiflu) 75 mg and valacyclovir 500 mg were then administered orally twice daily for 5 days. The patient's fever, chills, and vomiting subsided 2 days later. The real-time reverse-transcriptase polymerase chain reaction (RT-PCR) analysis of nasal discharge for influenza virus types A and B showed positive results for the A/H1N1 influenza virus. The early pregnancy was terminated by therapeutic curettage at the patient's request. The surgical specimen revealed products of conception with the presence of necrotic chorionic villi, and focal lymphocytes in decidual tissue. RT-PCR analysis of gestational tissue for A/H1N1 was negative.
Conclusion: Pregnant women with H1N1 infection seem to benefit from antiviral therapy.

Keywords: antiviral therapy; H1N1 infection; intravascular disseminated coagulopathy; pregnancy

Introduction

Influenza A virus is an RNA, single-stranded, enveloped, orthomyxovirus that contains H and N surface glycoproteins. The Center for Disease Control and Prevention (CDC) first identified cases of respiratory infection with the 2009 H1N1 influenza virus in the United States in April 2009. On July 11, the 2009 H1N1 influenza virus spread was considered pandemic. Identification of this virus in humans attracted attention because the viral gene segment is a triple-reassortant derived from avian, human, and swine lineages [1]. According to the literature, pregnant women are at high risk of complications from influenza. The rate of hospital admission for H1N1 is much higher for pregnant than for nonpregnant women [2]. In addition, adverse pregnancy outcomes have been reported following previous influenza pandemics, with increased rates of spontaneous abortion and preterm birth [3]. Herein, we present a case of severe complicated 2009 H1N1 influenza virus infection in a woman in early pregnancy.

Case report

A 23-year-old woman, gravida 1, para 0, was presented to our institution in October 2009 because of the sudden onset of sore throat, fever, chills, and vomiting for 5 days. Her surgical, medical, family, and gynecologic history was noncontributory. At that time, transvaginal sonography revealed an intrauterine pregnancy of 9 weeks. Influenza A&B tests (immunochromatographic assay, Sancordon Inc., Taipei, Taiwan) showed negative results, and the patient was given antipyretic drugs with

* Corresponding author. Department of Obstetrics and Gynecology, Kuo General Hospital, No. 22, Section 2, Minsheng Road, Tainan City, Taiwan.
E-mail address: shaunkarn@gmail.com (C.-H. Lin).

1028-4559/$ - see front matter
doi:10.1016/j.tjog.2012.01.016

acetaminophen. Subsequently, the patient developed a dry cough and general malaise. On physical examination, she appeared acutely ill with tachycardia of 110 beats/min and a body temperature of 39°C. Multiple painful herpetic vesicles were found over the bilateral vulva with swelling and tenderness. Chest radiography revealed no pulmonary infiltration. On admission, laboratory tests showed a white blood cell count of 2400/μL, with neutrophils 56% and band forms 14%, platelet 104,000/μL (reference: 150–450/μL), D-dimer (fibrin-degraded products) 1891 μg/L (reference: <324 μg/L), lactate dehydrogenase 1663 IU/L (reference: 180–460 IU/L), aspartate aminotransferase (AST) 323 IU/L, alanine aminotransferase (ALT) 254 IU/L, and C-reactive protein 9.28 mg/dL. The test for human simplex virus II immunoglobulin M (IgM) was positive (2.64 RU/mL), on the day of admission, and the influenza A&B test was positive for influenza A in the nasal and throat samples. The diagnosis included early pregnancy with H1N1 infection, vulvar herpes infection, and impending intravascular disseminated coagulopathy. The patient was transferred to our intensive care unit (ICU). Oseltamivir (Tamiflu) 75 mg and valacyclovir 500 mg were then administered orally twice daily for 5 days. The patient's fever, chills, and vomiting subsided 2 days later. In the follow up, the real-time reverse-transcriptase polymerase chain reaction (RT-PCR) analysis of nasal discharge for influenza virus types A&B showed positive results for the H1N1 influenza virus. The early pregnancy was terminated by therapeutic curettage at the patient's request. The surgical specimen revealed products of conception with the presence of necrotic chorionic villi, and focal lymphocytes in the decidual tissue (Fig. 1). No evidence of a pyogenic pathogen was observed; RT-PCR analysis of gestational tissue for H1N1 was also negative.

Discussion

In April 2009, a novel influenza A (H1N1) virus was identified, and it has since been recognized as the cause of a pandemic outbreak in the United States and worldwide. Pandemic H1N1 influenza is having far-reaching effects with a wide spectrum of disease presentations. Influenza-like illness is defined as fever and cough or sore throat. Other common symptoms include rhinorrhea, headache, shortness of breath, and myalgia, with some patients also reporting vomiting and diarrhea. In most cases, the reported symptoms are mild. However, a case of influenza may rapidly worsen.

Because pregnancy suppresses the immune system, women at any stage of pregnancy are more susceptible to respiratory infection or adverse alteration of their clinical course [3]. The susceptibility of pregnant women to viral infections lies in the fact that pregnancy is associated with an immunologic shift from cell-mediated immunity to humoral immunity. Although this physiological change is necessary to facilitate paternally-derived fetal antigens, it renders the pregnant woman more vulnerable to intracellular pathogens such as viruses. Similarly, a study by Mullooly and colleagues also attests to the potential for increased morbidity resulting from influenza in pregnancy. Looking at influenza A epidemics over a 5-year period (1975–1979), they found a significant excess of acute respiratory diseases among pregnant women [4]. Pregnant women might thus be at increased risk of complications from pandemic H1N1 virus infection, and illness may progress rapidly.

One of the more well-studied adverse effects of influenza is its associated hyperthermia [5]. Studies have shown that maternal hyperthermia during the first trimester doubles the risk of neural tube defects and may be associated with other birth defects and adverse outcomes. In this case, the patient seemed to benefit from antiviral therapy. A surgical specimen revealed necrosis of the chorionic villi, which may have been an ominous sign for her pregnancy.

Importantly, some investigators have found that the time of initiation of antiviral treatment was an important factor affecting outcomes. One study reported that women who did

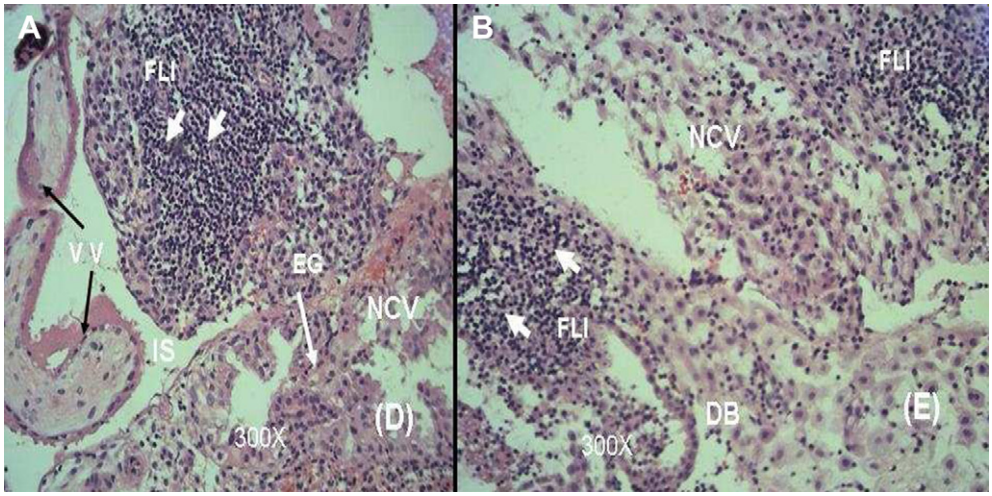

Fig. 1. Pathological microscopic description of the products of curettage. Sections through (A) junction of chorion and (B) decidual basalis at 9 weeks of gestation. DB = decidual basalis; EG = endometrial glands, long white arrow, two white short arrows; FLI = focal lymphocytic infiltration; IS = intervillous space; NCV = necrotic chorionic villi; VV = viable villi, two black arrows.

not receive antiviral therapy within 48 hours of symptom onset were more likely to require admission to the intensive care unit and were more likely to die. Similarly, our patient was admitted to the intensive care unit because she had symptoms for 5 days.

In our daily practice, there should be suspicion of H1N1 when any pregnant woman complains of upper respiratory symptoms and/or fever, myalgia, headache, vomiting, or diarrhea, given the wide spectrum of the disease. Clinical assessment should include serial monitoring of vital signs, along with pulse oximetry, and a thorough physical exam. If symptoms persist, chest radiography and blood gas analysis should be done. It is also important to note that the sensitivity of the rapid influenza antigen was as low as 30%, with a specificity as low as 58% in some studies [6–8], so a negative test result in the face of strong clinical suspicion should not alter management. For presumed cases, treatment with oseltamivir should be initiated within 48 hours of symptom onset [9]. Treatment may be started beyond 48 hours on a case-by-case basis [10].

In the present case, the histopathologic report of the curettage specimen demonstrated necrotic chorionic villi and focal lymphocytes in the decidual tissue. Actually, we hypothesized that the necrotic tissue might have represented an impending missed abortion due to H1N1 infection. In addition, elevated expression of activation markers by endometrial lymphocyte cells could lead to the initiation of abnormal immunological reactions capable of destroying the delicate balance that exists in the immunologically distinct uterine microenvironment, culminating in fetal rejection [11].

Given the potential for rapidly worsening disease, close follow up is recommended. The physician who prescribes treatment should evaluate the response to treatment within the first 24 hours of therapy.

References

[1] Smith GJD, Vijaykrishna D, Bahl J, Lycett SJ, Worobey M, Pybus OG, et al. Origins and evolutionary genomics of the 2009 swine-origin H1N1 influenza A epidemic. Nature 2009;459:1122–5.

[2] Jamieson DJ, Theiler RN, Rasmussen SA. Emerging infections and pregnancy. Emerg Infect Dis 2006;12:1638–43.

[3] Jamieson DJ, Honein MA, Rasmussen SA, Williams JL, Swerdlow DL, Biggerstaff MS, et al. H1N1 2009 influenza virus infection during pregnancy in the USA. Lancet 2009;374:451–8.

[4] Mullooly JP, Barker WH, Nolan TF. Risk of acute respiratory disease among pregnant women during influenza A epidemics. Public Health Rep 1986;101:205–11.

[5] Graham JM, Edwards MJ, Edwards M. Teratogen update: gestational effects of maternal hyperthermia due to febrile illness and resultant patterns of defects in humans. Teratology 1998;58:209–21.

[6] Ruest A, Michaud S, Deslandes S, Frost EH. Comparison of the Directigen flu A+B test, the Quick Vue influenza test, and clinical case definition to viral culture and reverse transcription-PCR for rapid diagnosis of influenza virus infection. J Clin Microbiol 2003;41:3487–93.

[7] Uyeki TM, Prasad R, Vukotich C, Stebbins S, Rinaldo CR, Ferng YH, et al. Low sensitivity of rapid diagnostic test for influenza. Clin Infect Dis 2009;48:e89–92.

[8] Quach C, Newby D, Daoust G, Rubin E, McDonald J. Quick Vue influenza test for rapid detection of influenza A and B viruses in a pediatric population. Clin Diagn Lab Immunol 2002;9:925–6.

[9] Saleeby E, Chapman J, Morse J, Bryant A. H1N1 influenza in pregnancy: cause for concern. Obstet Gynecol 2009;114:885–91.

[10] Rasmussen SA, Jamieson DJ, Poresee JS. Pandemic influenza and pregnant women. Emerg Infect Dis 2008;14:95–100.

[11] Maruyama T, Makino T, Sugi T, Matsubayashi H, Ozawa N, Nozawa S. Flow-cytometric analysis of immune cell populations in human decidua from various types of first-trimester pregnancy. Hum Immunol 1992;34:212–8.