Pandemic 2009 influenza A H1N1 retinopathy

Pandemic 2009 influenza A H1N1 has spread rapidly, causing disproportionate morbidity in adolescents and young adults. Influenza A mediated retinopathies have been reported in the past, but to our knowledge this is the first reported case of 2009 influenza A H1N1 retinopathy.

A healthy 24-year-old female presented October 30, 2009, with a 1-day history of bilateral blind spots, and 3 days of fever, chills, congestion, and headaches. The patient was given a clinical diagnosis of 2009 influenza A H1N1 based on a positive OSOM Influenza A&B Test (Genzyme Diagnostics, Cambridge, Mass.) in conjunction with her symptoms and clinical course.

On examination, the patient had swollen submandibular and preauricular lymph nodes and a blood pressure of 120/80. Visual acuity was 20/20 OD and 20/25 OS and the anterior segments were unremarkable. Fundoscopy and fluorescein angiography revealed bilateral peripapillary cotton wool spots (Figs. 1, 2, and 3). Blood work was normal, including complete blood count, antinuclear antibody, hemoglobin A_1C, rheumatoid factor, human immunodeficiency virus antibody immunoassay, and monospot testing. Complete resolution of cotton wool spots occurred over the course of 3 weeks.

Pandemic 2009 influenza A H1N1, a triple-reassortant swine influenza, has spread rapidly since its first American report in April 2009, becoming only the third influenza pandemic since the deadly 1918 H1N1 Spanish influenza. Although the novel virus has clinical manifestations similar to those of severe seasonal influenza, it atypically affects predominantly adolescents and young adults, with higher rates of morbidity.[1] As of September 2009, the United States Centers for Disease Control and Prevention reported 99% of circulating influenza virus to be 2009 H1N1, allowing for a clinical diagnosis of H1N1 2009 and initiation of empiric treatment, with or without a highly specific rapid influenza diagnostic test.[2] We believe this to be the first reported case of retinal findings associated with the 2009 pandemic.

Clinical testing in our patient revealed no underlying systemic disorder, supporting the patient's influenza infection as the etiology of her findings. Valsalva retinopathy, which can occur with severe coughing, was unlikely, given the lack of associated intraretinal hemorrhages, a defining characteristic.[3]

Prior reports of influenza A retinopathy exist, including bilateral angiopathy associated with macular edema and cotton wool spots, bilateral frosted branch angiitis, bilateral retinitis in association with influenza encephalitis, bilateral submacular hemorrhages, and bilateral macular lesions. Rabon et al.[4] reported a case of bilateral cotton wool spots and macular edema in association with influenza A, which resolved over 3 days. Another case reported bilateral frosted branch angiitis and macular edema treated with oral prednisone, which resolved over 6 months with minimal visual deficit.[5] Our case resembles these 2 cases in its temporal relationship of ocular findings to a confirmed systemic influenza A illness and in the predominant vascular retinopathy with exclusion of other entities. Our case does appear to be less severe and without any significant macular changes, favoring a complete recovery. As the 2009 influenza A H1N1 pandemic continues to grow in scope, we expect that additional cases of associated retinal manifestations may emerge.

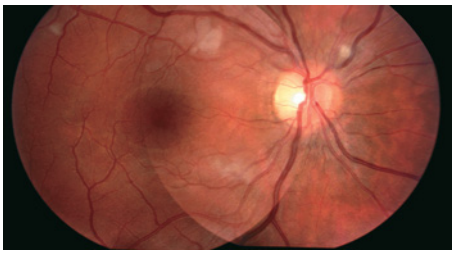

Fig. 1—Fundus photograph of the right eye revealing multiple peripapillar cotton wool spots in the absence of vitritis, retinal hemorrhage, disc edema, macular edema, or vascular sheathing.

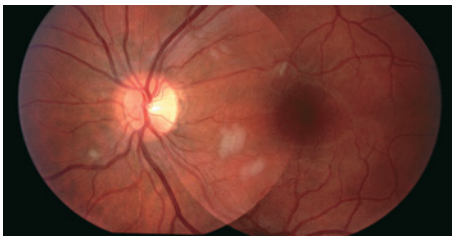

Fig. 2—Fundus photograph of the left eye revealing multiple peripapillar cotton wool spots in the absence of vitritis, retinal hemorrhage, disc edema, macular edema, or vascular sheathing.

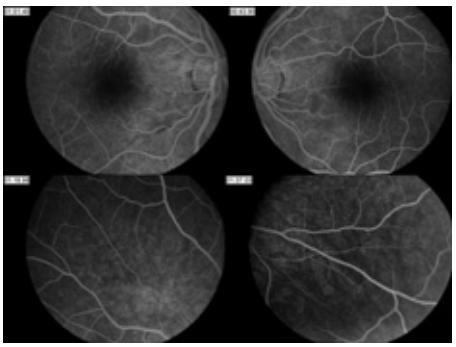

Fig. 3—Fluorescein angiogram images centered over the macula of the right eye (top left) and left eye (top right) revealing areas of fluorescein blockage corresponding to cotton wool spots seen on fundus photographs. Representative peripheral sweeps of the right eye (bottom left) and left eye (bottom right) reveal no peripheral abnormalities.

References

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OphthoStudent.com: collaborative learning in ophthalmology for medical students

In addition to traditional classroom lectures, medical education today employs a variety of innovative learning modalities, such as problem-based and game learning, in order to appeal to students with different learning styles. Ophthalmology teaching at this level, however, is still largely didactic with little opportunity for interaction. Because there is little time devoted to ophthalmology in medical school curricula, medical students are at risk of being inadequately trained to deal with ophthalmic complaints.[1]

Interactive computer-based modules benefit preclinical medical students by helping them learn more effectively through an active approach.[2] To integrate this approach into preclinical ophthalmology education, a web site was created (www.ophthostudent.com) with interactive, quiz-style questions where students are able to (*i*) evaluate their knowledge of ophthalmology, (*ii*) discuss question content or structure, which other users can access and contribute to, and (*iii*) submit their own questions or cases.

The web site, part of the QuizMD (www.quiz.md) framework of teaching sites, currently has 123 student-created questions covering many aspects of ophthalmology, including diagnosis, etiology, pathophysiology, and management; clinical cases are also being developed to stimulate problem-solving skills (Fig. 1). Input and feedback from practising ophthalmologists ensure that the content is accurate and relevant. Similar undergraduate QuizMD sites are in use for plastic surgery (www.plasticstudent.com), pediatrics (www.pedscases.com), and other areas.

With 1565 total responses to 123 questions (average 12.6 responses/question), OphthoStudent.com has received significant interest from student users. In the last 12 months, 1603 unique users have viewed ophthalmology-related content, translating to 10.7% of total QuizMD content visits (n = 14 899). Questions tagged "ophthalmology" constitute ~10% of all QuizMD questions. Sixty-eight of the 123 questions are cross-tagged to at least 1 other QuizMD subsite, the most popular being emergency medicine (23 questions), pediatrics (20 questions), and neurology (12 questions). Individuals who created questions for OphthoStudent.com were also likely to create questions for other QuizMD sites; these individuals created a total of 207 non-ophthalmology questions. The QuizMD parent site has viewers from 139 countries other than Canada (Fig. 2), a trend mirrored in OphthoStudent.com.

Respondents' success in answering correctly varied, depending on the question, with an average of 70.4% correct responses. Of 115 attempted questions on the site, 54 were answered correctly at least 80% of the time, and 14 questions were answered correctly less than 40% of the time. This suggests that the range of questions is appropriately challenging and, therefore, educational for the medical student visitors.

OphthoStudent.com is a student-driven, innovative modality that enhances current didactic methods. This type of peer education not only improves learning outcomes but also fosters leadership skills, self-evaluation, and clinical reasoning abilities.[3] As such, we hope that more students will use the web site, thereby improving their own education and the website through their contributions. Possible future development includes subcategor-

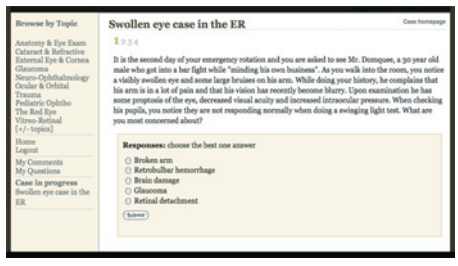

Fig. 1—Case-based questions allow students to expand their knowledge with practical, real-life clinical scenarios.