



glycemia (Fig. 1B) was influenced by the presence or absence of rosiglitazone.

Epstein and Cooper-DeHoff ask whether the effect of potassium could have influenced our results. Unfortunately, we did not measure potassium levels after randomization.

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## Prevention of Meningococcal Disease

**TO THE EDITOR:** In his article on the prevention of meningococcal disease, Gardner (Oct. 5 issue)<sup>1</sup> notes that both active and passive smoking may be risk factors for the disease but does not address the issue of exposure to smokers as differentiated from exposure to smoke. Contact with smokers rather than smoke is now recognized as a critical risk factor, most likely owing to higher rates of carriage and coughing among smokers.<sup>2-4</sup> The case-control study by Coen et al. of 144 teenage survivors of meningococcal disease showed that older teens are more at risk from exposure to smokers than to smoke.<sup>4</sup> In two studies, significant odds ratios for meningococcal disease (3.8 and 9.1) were reported for children whose mothers smoked.<sup>2,3</sup> A remarkable 37% of cases were reported as being attributable to exposure to smok-

ers in one of the studies,<sup>2</sup> and we estimate that 60% of cases were attributable to exposure to smokers in the other study.<sup>3</sup> Public health messages should underscore the need to stop smoking, not merely the need to limit smoking to outside the home.

Gardner also mentions that deficiency in the terminal complement pathway is responsible for increased risk but does not mention the much more common deficiency of mannose-binding lectin. Recent work has demonstrated that a deficiency of this protein, which is responsible for activation of the alternative complement pathway, is a critical factor. The frequency of homozygous variants was significantly higher among 194 children with meningococcal disease than among control subjects (odds ratio, 6.5; 95% con-

fidence interval, 2.0 to 27.2). The fraction of cases attributed to mannose-binding lectin variants was 32%.<sup>5</sup>

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2. Fischer M, Hedberg K, Cardosi P, et al. Tobacco smoke as a risk factor for meningococcal disease. *Pediatr Infect Dis J* 1997;16:979-83.
3. McCall BJ, Neill AS, Young MM. Risk factors for invasive meningococcal disease in southern Queensland, 2000-2001. *Intern Med J* 2004;34:464-8.
4. Coen PG, Tully J, Stuart JM, Ashby D, Viner RM, Booy R. Is it exposure to cigarette smoke or to smokers which increases the risk of meningococcal disease in teenagers? *Int J Epidemiol* 2006;35:330-6.
5. Hibberd ML, Sumiya M, Summerfield JA, Booy R, Levin M. Association of variants of the gene for mannose binding lectin with susceptibility to meningococcal disease. *Lancet* 1999;353:1049-53.

**TO THE EDITOR:** The article by Gardner identifies close contacts of an index patient with meningococcal disease who would need chemoprophylaxis. These contacts include people who have been directly exposed to the patient's oral secretions, including through kissing. However, saliva itself is thought to have an inhibitory effect on meningococcus, probably owing to the presence of other oropharyngeal flora.<sup>1</sup> This has been supported by a study of 258 college students in the United Kingdom, in which meningococcal carriage in the tonsils, nasopharynx, and saliva was examined. The overall carriage rate was 34.9% (90 of 258 students), but only one swab from saliva (0.4%) was positive for meningococcus.<sup>1</sup> The Australian national guidelines now recommend that chemoprophylaxis not be used purely on the basis of activities such as nonintimate kissing (even on the mouth) or sharing of food, drinks, cigarettes, or bongs.<sup>2</sup> However, intimate kissing, especially with multiple partners, is a risk factor for meningococcal disease.<sup>3</sup> Certainly, as Gardner suggests, endotracheal intubation and mouth-

to-mouth resuscitation would constitute sufficient exposure to warrant chemoprophylaxis; however, the risk associated with these activities is probably related to aerosolization of meningococci rather than exposure to saliva.

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**THE AUTHOR REPLIES:** Clinical Practice articles in the *Journal* focus on management considerations, and space constraints allow for only a limited discussion of basic science and public health issues. Dr. Booy and colleagues provide additional insights in both areas. First, they note that in addition to the long-recognized increased risk of invasive meningococcal disease from active and passive smoking, there is an increased risk from exposure to people who smoke (presumably because these people have increased colonization with *Neisseria meningitidis*). It is notable that, despite the recognition of smoking as a risk factor for both invasive meningococcal disease<sup>1</sup> and invasive pneumococcal disease,<sup>2</sup> the Advisory Committee on Immunization Practices of the Centers for Disease Control and Prevention has failed to include smokers among the high-risk groups for which immunization against these diseases is recommended.<sup>1,3</sup> Second, their mention of a deficiency of mannose-binding lectin in the pathophysiology of invasive meningococcal disease is welcome.

Dr. Senanayake discusses the Australian guidelines for chemoprophylaxis, which define persons considered to be close contacts of a patient with meningococcal disease more specifically than do the U.S. guidelines. Noting that saliva is a much less likely source of *N. meningitidis* than material taken from the nasopharynx or tonsils, the Australians do not consider "nonintimate kissing" or shared ingested or smoked materials to constitute significant exposure. Accordingly, the Australian recommendations for chemoprophylaxis are more restrictive than the U.S. recommenda-

tions.<sup>1</sup> I applaud the effort to define the at-risk contacts more precisely but anticipate that parsing the definition too finely will result in many gray areas and may make the guidelines difficult to implement.

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1. Prevention and control of meningococcal disease: recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR Recomm Rep* 2005;54(RR-7):1-121.

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3. Prevention of pneumococcal disease: recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR Recomm Rep* 1997;46(RR-8):1-24.

## Medical Mystery: Abnormal Abdominal Radiograph — The Answer

**TO THE EDITOR:** The medical mystery in the December 7, 2006, issue<sup>1</sup> involved a 50-year-old woman who presented to the emergency department with obtundation and hypotension. An abdominal radiograph showed gas throughout the right kidney (Fig. 1A). Computed tomography (CT) of the abdomen revealed extensive destruction of the right renal parenchyma with associated gas, as

well as gas in the retroperitoneal tissues (Fig. 1B). The patient's serum glucose level at presentation was 607 mg per deciliter (33.7 mmol per liter), and her glycated hemoglobin value was 12.2%. She did not have diabetic ketoacidosis. A diagnosis of emphysematous pyelonephritis in the setting of diabetes mellitus was made. The patient underwent urgent right nephrectomy, and *Escherichia coli* was cultured from the surgical site and from the blood. She had an uneventful recovery, with normalization of her renal function. Her newly diagnosed diabetes is well controlled through insulin therapy, and she is doing well.

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1. Tajima K, Kurabayashi M. Medical mystery — abnormal abdominal radiograph. *N Engl J Med* 2006;355:2467.

*Editor's note:* We received 1162 responses to this medical mystery — 55% from physicians in practice, 19% from physicians in training, 13% from medical students, and 13% from other readers. Responses were received from 82 countries. Many of the responses reflect a team effort — such as the results of a discussion of the case during a teaching conference.

Forty percent of the respondents correctly identified gas associated with the right kidney or emphysematous pyelonephritis. Eleven percent suggested a gallbladder disorder such as emphysematous cholecystitis, 12% suggested other infections (e.g., hydatid cyst or hepatic abscess), another 12% suggested cancer (e.g., renal, adrenal, or hepatic), and 19% suggested a variety of diagno-

