

# Increased Risk of MenB Infection in College Students: Time to Reconsider Vaccine Recommendations?

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Meningococcal infections can be fulminant and result in death only a few hours after symptom onset. The mortality rate ranges between 10% and 15%, and those who survive can have severe sequelae.<sup>1</sup> Globally, it is estimated that 1.2 million cases of invasive meningococcal infections occur annually and result in 135 000 deaths.<sup>2</sup>

Primary prevention of disease through vaccination is essential for control of endemic and epidemic meningococcal disease. Serogroup B meningococcal (MenB) infections account for 65% of cases in infants in the United States (incidence: 3.3 cases per 100 000) and the majority of cases overall in some European countries, including England.<sup>2</sup> In 2014 and 2015, 2 recombinant MenB vaccines were licensed in the United States for individuals 10 to 25 years of age.<sup>2</sup> MenB vaccines are currently recommended routinely for high-risk groups in the appropriate age category (Category A recommendation) and may be considered in adolescents and young adults (Category B recommendation).

In this issue of *Pediatrics*, Mbaeyi et al<sup>3</sup> used the enhanced meningococcal disease surveillance activities of the National Notifiable Diseases Surveillance System to demonstrate that college students in the United States are at increased risk for MenB disease. These data modify the current understanding of the epidemiology of meningococcal disease. When the Advisory Committee on Immunization

Practices of the Centers for Disease Control and Prevention deliberated MenB vaccines in June 2015, college attendance was not identified as a risk factor for MenB infections.<sup>4</sup> This fact, along with others, was considered in the decision to make MenB adolescent vaccination a Category B recommendation. So the question at hand is, if we now know that college students are at increased risk for MenB disease, should vaccine recommendations change?

To better answer this question, one should consider all of the factors that played into the Category B recommendation. Broadly, they include the low burden of meningococcal disease in the United States and concerns related to MenB vaccine efficacy, including lack of information about the duration of protection, effect on carriage, and strain coverage.<sup>4</sup>

When considering the burden of meningococcal disease alone, it is difficult to recommend routine MenB vaccination of adolescents and young adults. In 2016, there were 130 cases of MenB disease in the United States; of these, 41 occurred in individuals 16 to 23 years of age.<sup>1</sup> Mbaeyi et al<sup>3</sup> report that the annual incidence in college-aged persons 18 to 24 years old was 0.17 cases per 100 000 population between 2014 and 2016. The incidence in individuals the same age but not in college was 0.05 cases per 100 000 population. The relative risk for MenB for college versus noncollege students was 3.54 (95% confidence interval: 2.12–5.41). During 2014–2016, 6

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college campus outbreaks of MenB occurred, accounting for 32% of the MenB cases in college students. However, the increased risk [2.76 [95% confidence interval: 1.73–4.4]] for MenB infection remained even when only sporadic cases and the first case associated with outbreaks were included in the analysis.

With regard to vaccine performance, new data support MenB vaccine effectiveness. For example, in England there was a 50% incidence rate ratio reduction in MenB cases after implementation of a 2-dose infant schedule.<sup>5</sup> However, questions remain related to duration of protection, effect on carriage, and strain coverage.

There are consequences for Category B recommendations. A recent national survey showed that primary care providers are less likely to recommend a vaccine if it carries a Category B recommendation.<sup>1</sup> Likely as a result, coverage rates are low. It is estimated that <10% of 16- to 18-year-olds in the United States have received at least 1 dose of MenB vaccine and only 2% of colleges specifically require MenB vaccine.<sup>6</sup> However, findings by Mbaeyi et al<sup>3</sup> are unlikely to change the Category B recommendation.

Although the above factors must be considered when making public

health recommendations, on an individual level the decision to vaccinate an adolescent with MenB vaccine is much more straightforward. Meningococcal infections are life-threatening. We have evidence from other countries that MenB vaccines are effective. MenB vaccines are covered by insurance companies and the Vaccines for Children Program, even under the Category B recommendation. And now we can say that college students are at increased risk for MenB disease. Pediatricians and primary care providers have a more compelling reason to recommend MenB vaccine for their patients who anticipate attending college. At a minimum, pediatricians should educate students and families regarding the increased risk of MenB infections in college students in the United States and inform them that 2 vaccines are available that can potentially protect college students from this infection. Side effects related to MenB vaccination are relatively minimal. Students and parents can then make an informed decision about receiving MenB.

#### ABBREVIATION

MenB: serogroup B meningococcal

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