Etiologic Role of *Hafnia alvei* in Human Diarrheal Illness

I read with interest the article by Dr. Albert and colleagues presenting evidence for the association of *Hafnia alvei* with human diarrheal illness (1). The authors state that to their knowledge *H. alvei* has never been implicated as a causative agent of diarrhea. As far back as 1957, Harada et al. (3) reported isolating *Hafnia* species from two infants and a woman with vomiting and diarrhea. In 1961, on the basis of the results of toxicity tests with ligated rabbit intestine, Dr. Sakazaki reported that members of the genus *Hafnia* could possess diarrheagenic potential (5). In fact, a number of *Hafnia* isolates he tested were from diarrheic stools. There has been at least one other report suggesting a possible role for *H. alvei* in sporadic gastrointestinal (2), and our own report in 1979 incriminated *H. alvei* in a nosocomial outbreak of gastroenteritis (4). Although we were likely the first to report an outbreak of gastroenteritis associated with this agent, our findings did not appear in a refereed publication, and hence, I am including a brief account.

Two outbreaks of gastroenteritis occurred, a month apart, in a general hospital, affecting 15 inpatients in the first outbreak and 25 inpatients in the second outbreak. *H. alvei* (then referred to as *Enterobacter hafniae*) was isolated from stool cultures as either predominant or heavy pure growth from five of eight patients tested from the first episode and 8 of 15 patients tested during the second episode. Antibiotic treatment was excluded as a possible cause of diarrhea. Of 75 dietary staff screened by stool cultures, 3 yielded *H. alvei* in light and mixed growth, and all 75 were asymptomatic. None of the patients or the dietary staff was positive for commonly recognized enteric pathogens. Further studies with the *H. alvei* isolates from both episodes indicated that all belonged to a single biotype (biotype 1) and serotype (O3:H−). (It is worth noting that according to the antigenic schema reported by Dr. Sakazaki in 1961 (5), the Hafnia group consisted of 29 O groups, 23 H antigens, and 51 serotypes.) As with Dr. Albert’s strain, all our isolates tested negative for heat-labile and heat-stable enterotoxins and for enteroinvasive activity. In addition, they also tested negative for Vero cytotoxin. *H. alvei* was not found in over 1,000 stool cultures monitored subsequent to the outbreaks except for a single instance a month later. *H. alvei* was isolated as a heavy pure growth in the absence of other enteric pathogens from a sporadic case of gastroenteritis within the hospital. This strain turned out to be biotype 9 and serotype O22:H−.

Our observations clearly incriminated *H. alvei* in the outbreaks of gastroenteritis, although the source of the outbreak and its possible relation to food and food handlers could not be established conclusively.

There is no reliable data as to the true rate of isolation of *H. alvei* from clinical specimens in routine practice. While the generally known incidence is small, it is not known whether this might be due to lack of information on the clinical significance of this agent. It appears that *H. alvei* has a greater role in human diarrheal illness than currently recognized. It is important to recognize that, in spite of a virtual revolution in the ability to uncover and identify enteric pathogens in the recent past, clinical laboratories still do not come up with a specific etiologic diagnosis in the great majority of diarrheal cases. I concur with Dr. Albert and his colleagues that at least some strains of *H. alvei* have diarrheagenic potential, and there is a need to determine the relative importance of *H. alvei* in human diarrheal illness.

REFERENCES


Author’s Reply

I agree with the comment of Dr. Ratnam that there is a need to determine the relative importance of *Hafnia alvei* in human diarrheal illness. Also, Dr. Ratnam draws your attention to our statement that “to our knowledge it (*H. alvei*) has never been implicated as a causative agent of diarrhea” (1) and quotes some earlier studies which suggested a possible role for *H. alvei* in diarrhea. I wish to point out that most of the quoted studies were reported a long time ago in relatively inaccessible journals, and even according to the latest edition of Edwards and Ewing’s *Identification of Enterobacteriaceae* (3) “members of this species are not known to be incitants of gastroenteritis.” The study of Emslie-Smith (2) which Dr. Ratnam quotes used strains of *H. alvei* isolated from feces of patients suffering from gastroenteritis, and this study did not suggest that this organism was the cause of diarrhea. Even in Dr. Ratnam’s study (5), no virulence property was demonstrated for the isolates. I did not have ready access to the Japanese reports (4, 6), and so I am unable to comment on them.

Ours was the first study (1) which reproduced diarrhea in whole-animal models and demonstrated the well-known pathogenic lesion of attachment-effacement as the basis of diarrhea. This report was based on a single isolate, and we have since isolated several strains of *H. alvei* from patients with diarrhea in the absence of well-recognized pathogens. All these strains possessed the attaching-effacing property found in the original isolate.

On the basis of our experience, I would like to alert other investigators to the possible role of *H. alvei* in human diarrheal illness.

REFERENCES


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