

Letters to the Editor

Heat-Labile Serotyping of Two *Campylobacter jejuni* Strains Isolated from Patients with Guillain-Barré Syndrome and Belonging to Serotype O19 (Penner)

Misawa et al. (3) recently reported a PCR-based method for differentiating *Campylobacter* serotype O19 strains from non-O19 strains. In another study (2), the same investigators used restriction fragment length polymorphism analysis of *flaA* genes and random amplified polymorphic DNA analysis of *C. jejuni* strains to conclude that all serotype O19 strains are closely related, regardless of their geographic origins, heat-labile (HL) serotype, or association with Guillain-Barré syndrome (GBS). In both studies, these researchers described a pair of *C. jejuni* isolates of Penner serotype O19 (OH4382 and OH4384) which were originally recovered from two Japanese siblings suffering from GBS (1) and characterized as HL serotype 7. The other *C. jejuni* serotype O19 GBS strains belonged to either serotype HL77 or HL84 (2, 3).

To understand how strains that appeared to be clonal could have different HL antigens, we further investigated the HL antigens of *C. jejuni* strains OH4382 and OH4384. Whereas strains OH4382 and OH4384 did not appear to agglutinate in serotyping antiserum specific for HL type 7, they both agglutinated when HL typing antisera to types 77 and 84 were tested. These slide agglutination results were confirmed with an indirect whole-cell enzyme-linked immunosorbent assay (ELISA) in which both strains reacted with anti-HL77 and anti-HL84 antisera but failed to react with anti-HL7 antiserum.

To confirm the results described above, antisera to both *C. jejuni* OH4382 and *C. jejuni* OH4384 were prepared in rabbits. After absorption of the antisera with a formalin-inactivated, whole-cell suspension of an unrelated *C. jejuni* standard strain

(Penner O3:HL36) to remove antibodies to the common surface components on the *Campylobacter* organisms, we tested the absorbed antisera against HL type strains 7, 77, and 84 by an indirect whole-cell ELISA (Fig. 1). The results verified that *C. jejuni* strains OH4382 and OH4384 do not contain specific surface antigens related to HL type 7 but do possess surface components that induce antibodies to react specifically with HL serostrains 77 and 84.

To better understand the serological relationship of HL77 and HL84 type strains, we used a standard method (4) to determine their heat-stable (HS) O antigens. While *C. jejuni* HS O19 strains are not particularly common, it was surprising and unusual to observe that both the HL77 and HL84 type strains were found to possess the HS O:19 antigen. After removal of the anti-O19 antibodies by absorption with O19 lipopolysaccharide-sensitized red blood cells, anti-OH4382 and anti-OH4384 antisera still contained antibodies that reacted with the HL type strains 77 and 84, indicating the presence of HL77 and HL84 antigens on both *C. jejuni* OH4382 and OH4384.

Our serological studies provide further evidence that *C. jejuni* strains of Penner serotype O19 appear to be clonal or closely related in that they share common HS O and HL surface antigens.

REFERENCES

1. Aspinall, G. O., A. G. McDonald, H. Pang, L. A. Kurjanczyk, and J. L. Penner. 1994. Lipopolysaccharides of *Campylobacter jejuni* serotype O19: structures of core oligosaccharide regions from serostrain and two bacterial isolates from

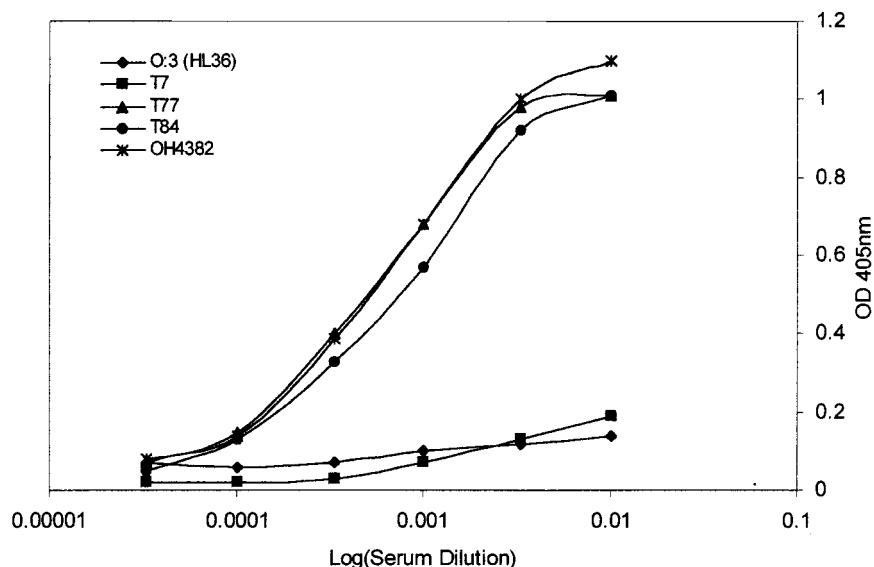


FIG. 1. Titration of anti-OH4382 antiserum against a homologous patient isolate (OH4382) and heterologous T7, T77, T84, and O3:HL36 serostrains by indirect whole-cell ELISA. OD, optical density.

- patients with Guillain-Barré Syndrome. *Biochemistry* **33**:241–249.
2. **Fujimoto, S., B. M. Allos, N. Misawa, C. M. Patton, and M. J. Blaser.** 1997. Restriction fragment length polymorphism analysis and random amplified polymorphic DNA analysis of *Campylobacter jejuni* strains isolated from patients with Guillain-Barré Syndrome. *J. Infect. Dis.* **176**:1105–1108.
 3. **Misawa, N., B. M. Allos, and M. J. Blaser.** 1998. Differentiation of *Campylobacter jejuni* serotype O19 strains from non-O19 strains by PCR. *J. Clin. Microbiol.* **36**:3567–3573.
 4. **Penner, J. L., and J. N. Hennessy.** 1980. Passive hemagglutination technique for serotyping *Campylobacter fetus* subsp. *jejuni* on the basis of soluble heat-stable antigens. *J. Clin. Microbiol.* **12**:732–737.

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Authors' Reply

Our classification of the HL type of the *C. jejuni* strains from Japanese sisters with Guillain-Barré syndrome was based entirely on the previous (1, 3) characterization. Tsang et al. now provide important evidence that the strains actually possess HL77 and HL84 antigens and not HL7 antigens. In this regard, the Japanese strains resemble O19 strains from other parts of the world (2), and thus the study of Tsang et al. provides

further phenotypic evidence consistent with clonal characteristics of O19 strains. The biochemical basis of the *C. jejuni* HL antigens is not defined. For certain serotypes, it is related to flagellar antigens, but for most types the basis is not known. The study of Tsang et al. also shows that HL77 and HL84 share important antigenic determinants, which also is consistent with clonality of the O19 strains. An important next step will be to define the chemical and structural basis of the HL77 and HL84 antigens of the O19 strains.

REFERENCES

1. **Aspinall, G. O., A. G. McDonald, H. Pang, L. A. Kurjanczyk, and J. L. Penner.** 1994. Lipopolysaccharides of *Campylobacter jejuni* serotype O19: structures of core oligosaccharide regions from the serostrain and two bacterial isolates from patients with Guillain-Barré Syndrome. *Biochemistry* **33**:241–249.
2. **Misawa, N., B. M. Allos, and M. J. Blaser.** 1998. Differentiation of *Campylobacter jejuni* serotype O19 strains from non-O19 strains by PCR. *J. Clin. Microbiol.* **36**:3567–3573.
3. **Yuki, N., S. Sato, S. Fujimoto, S. Yamada, Y. Tsujino, A. Kinoshita, and T. Itoh.** 1992. Serotype of *Campylobacter jejuni*, HLA, and the Guillain-Barré Syndrome. *Muscle Nerve* **15**:968–969.

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