(1) also tested a few strains from patients in whom penicillin treatment failed, and found no evidence of penicillin tolerance. Smith (2) reported no difference between the percentage of penicillin-tolerant strains found in bacteriologic treatment failures and that found in the eradicated strains. The data from our study shows that penicillin tolerance is common among group A streptococci, although we have found no previous reference to this phenomenon in our country.

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References

1. **Chaudhary, S., Bilinsky, S. A., Hennessy, J. L., Soler, S. M., Wallace, S. E., Schacht, C. M., Bisno, A. L.:** Penicillin V and rifampin for the treatment of group A streptococcal pharyngitis: a randomized trial of 10 days penicillin vs. 10 days penicillin with rifampin during the final 4 days of therapy. Journal of Pediatrics 1985, 106: 481–486.
2. **Smith, T. D., Huskins, W. Ch., Kim, K. S., Kaplan, E. L.:** Efficacy of β-lactamase-resistant penicillin and influence of penicillin tolerance in eradicating streptococci from the pharynx after failure of penicillin therapy for group A streptococcal pharyngitis. Journal of Pediatrics 1987, 110: 777–782.
3. **Brook, I.:** The role of beta-lactamase-producing bacteria in the persistence of streptococcal tonsillar infection. Reviews of Infectious Diseases 1984, 6: 601–607.
4. **Kim, K. S., Kaplan, E. L.:** Association of penicillin tolerance with failure to eradicate group A streptococci from patients with pharyngitis. Journal of Pediatrics 1985, 107: 681–684.
5. **National Committee for Clinical Laboratory Standards:** Approved standard: M7-A. Methods for dilution antimicrobial susceptibility tests for bacteria that grow aerobically. NCCLS, Villanova, PA, 1985.
6. **Bourgault, A., Wilson, W. R., Washington, J. A.:** Antimicrobial susceptibilities of species of viridans streptococci. Journal of Infectious Diseases 1979, 140: 316–321.
7. **Dagan, R., Ferne, M., Sheinis, M., Alkan, M., Katzenelson, E.:** An epidemic of penicillin-tolerant group A streptococcal pharyngitis in children living in a closed community: mass treatment with erythromycin. Journal of Infectious Diseases 1987, 3: 514–516.
8. **Feldman, S., Bisno, A. L., Lott, L., Dodge, R., Jackson, R. E.:** Efficacy of benzathine penicillin G in group A streptococcal pharyngitis: reevaluation. Journal of Pediatrics 1987, 110: 783–787.
9. **Ginsburg, C. M., McCracken, G. H., Steinberg, J. B., Crow, S. D., Dildy, B. F., Cope, F., Zweighaft, T.:** Treatment of group A streptococcal pharyngitis in children: results of a prospective, randomized study of four antimicrobial agents. Clinical Pediatrics 1982, 31: 83–88.
10. **Eagle, H., Muselman, A. D.:** The rate of bactericidal action of penicillin in vitro as a function of its concentration and its paradoxically reduced activity at high concentrations against certain organisms. Journal of Experimental Medicine 1948, 88: 99–131.
11. **Stevens, D. L., Gibbons, A. E., Bergstrom, R., Winn, V.:** The Eagle effect revisited: efficacy of clindamycin, erythromycin and penicillin in the treatment of streptococcal myositis. Journal of Infectious Diseases 1988, 158: 23–28.

Septic Abortion due to *Campylobacter jejuni*

Campylobacter jejuni causes predominantly intestinal illness (1), extraintestinal infections being relatively uncommon (2, 3, 4). We report here a case of mid-trimester septic abortion due to *Campylobacter jejuni* in a previously healthy woman who had contact with livestock.

The 25-year-old Moslem woman residing in a Western Galilee village with many sheep and chickens near her house, was admitted to the Nahariya Government Hospital. She presented with a four-day history of painless spotting with bright red vaginal bleeding and a one-day history of lower abdominal cramps. She denied any history of preceeding diarrhea. On examination her temperature was 37.9 °C. The cervix was not dilated and the uterus was enlarged. The patient was estimated to be 14 weeks pregnant. The vaginal bleeding was mild. Ultrasonographic examination showed one fetus with no movement or heart beat. The maternal peripheral white blood cell count was 20,000 cells/mm^3 with 82.4% neutrophils. The hemoglobin was 11.6 g/dl. Within 16h the patient's temperature reached 40.3 °C. A vaginal smear and two blood samples were taken and intravenous therapy with crystalline penicillin (10^6 U/day) and gentamicin (4 mg/kg/day) was started. On the following day she was afebrile and experienced a spontaneous incomplete abortion after which curettage was performed.

Specimens of vaginal discharge were cultured on Brain Heart Infusion (BHI) blood agar incubated at 37 °C in 10% CO_2. A gram stain showed many gram-negative vibrio-like and wing-shaped organisms, sus-

pected to be a *Campylobacter* sp. They were isolated and cultured on a selective Campylobacter medium with Butzler supplement at 42 °C in an anaerobic jar without catalyst and with a $H_2 + CO_2$ gas-generating envelope creating a microaerophilic reduced-oxygen atmosphere. Improved growth was observed under these conditions. Slight growth appeared on MacConkey's agar.

The same organism grew after four days in two blood culture flasks with BHI broth and 10% CO_2 incubated at 37 °C. A heavier culture was obtained with the same flasks at 42 °C, but no growth appeared at 25 °C in the broth or on chocolate or nutrient agar.

Catalase and oxidase tests were positive, the glucose degradation test negative, and the motility test positive. The hippurate hydrolysis test was also positive. The organism was resistant to cephalothin (30 μg/disc) and sensitive to nalidixic acid (30 μg/disc). According to the results of these tests the organism was identified as *Campylobacter jejuni*. Further tests showed the organism to be *Campylobacter jejuni* biotype 1 serotype 23. Fetal, placental and maternal fecal samples were not obtained. Histological examination revealed a macerated fetus of approximately 14 weeks. The placenta showed acute chorioamnionitis and fetal tissue with autolytic changes.

Campylobacter jejuni is a short, motile, microaerophilic, comma-shaped, gram-negative rod. The organism is widespread in nature and considered a major cause of infectious abortion in sheep. It is also found in the intestinal tract of healthy swine, cattle, sheep, goats, chickens, turkeys and wild birds (5, 6). In man *Campylobacter jejuni* is one of the commonest causes of infectious diarrhea (1). The pathogenesis of Campylobacter bacteremia is not well understood (7).

There are an increasing number of reports of spontaneous abortion or neonatal infections due to *Campylobacter* spp. A total of 22 cases, including our case, have been reported (8). All of the mothers recovered but fetal (neonatal) mortality was 80%. Only 30% had diarrhea. In summary, although rare infection with *Campylobacter* spp. should be considered in cases of sepsis during pregnancy even when diarrhea is absent, and especially when there is a history of contact with livestock.

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References

1. **Blaser, M. J., Berkowitz, I. D., La Force, F. M., Cravens, Y., Reller, L. B., Wang, W. L.:** Campylobacter enteritis: clinical and epidemiologic features. Annals of Internal Medicine 1979, 91: 179–185.
2. **Blaser, M. J., Perez, G. P., Smith, P. F., Patton, C., Tenover, F. C., Lastovica, A. J., Wang, W. L.:** Extraintestinal *Campylobacter jejuni* and *Campylobacter coli* infections: host factors and strain characteristics. Journal of Infectious Diseases 1986, 153: 552–559.
3. **Riley, L. W., Finch, M. J.:** Results of the first year of national surveillance of campylobacter infections in the United States. Journal of Infectious Diseases 1985, 151: 956–959.
4. **Communicable Disease Surveillance Center:** Review of campylobacter reports to CDSC London 1977–80. Communicable Diseases Report 1981, 12: 3–4.
5. **Bergey, D. H., Buchanan, R. E., Gibbons, N. E.:** Bergey's manual of determinative bacteriology. Williams and Wilkins, Baltimore, 1975, p. 207–210.
6. **Jensen, R., Miller, V. A., Hammarlund, M. A., Graham, W. R.:** Vibrionic abortion in sheep. I: Transmission and immunity. American Journal of Veterinary Research 1957, 18: 326–329.
7. **Klipstein, F. A., Engert, R. F., Short, H., Schenk, E. A.:** Pathogenic properties of *Campylobacter jejuni*: assay and correlation with clinical manifestations. Infection and Immunity 1985, 50: 43–49.
8. **Simor, A. E., Karmali, M. A., Jadavji, T., Roscoe, M.:** Abortion and perinatal sepsis associated with campylobacter infection. Reviews of Infectious Diseases 1986, 8: 397–402.

Polymicrobial Septicaemia and *Clostridium difficile*

Gerard et al. (1) report an interesting case of polymicrobial septicaemia in a patient with acute diverticulitis. However, the assumption that *Clostridium difficile* may be responsible for the fatal outcome of septicaemia in patients with underlying bowel disease should be treated with caution. *Clostridium difficile* is a rare cause of septicaemia (2) and more often than not is only one component of a polymicrobial infection. Other organisms are usually isolated which are recognised pathogens, such as *Bacteroides fragilis, Escherichia coli, Staphylococcus aureus* and *Enterococcus faecalis*. It is also important to note that in one of the cases reviewed (an infant with necrotizing enterocolitis) *Clostridium difficile* was isolated only from post mortem blood cultures, in addition to