# Correspondance

## Remission of cold hemagglutinin disease induced by rituximab therapy

Cold hemagglutinin disease is a chronic hemolytic anemia that is refractory to the usual treatments for hemolytic anemia mediated by a warm-reactive antibody; it may be associated with a low-grade lymphoma. Two previous case reports point to a possible role for this agent in the treatment of cold hemagglutinin disease.[1,2] Rituximab is an anti-CD20 monoclonal antibody of proven efficacy in the treatment of low-grade B-cell lymphomas.[3] We report a remission of cold hemagglutinin disease in response to single-agent therapy with rituximab.

In 1987, a 39-year-old man presented with idiopathic acquired cold hemagglutinin disease. Physical examination revealed pallor and jaundice. There was no lymphadenopathy or organomegaly. He had a hemoglobin concentration of 67 g/L, a hematocrit of 20.1% and a reticulocyte count of 9.7%. His white blood cell count was $5.1 \times 10^9$/L with 62% neutrophils, 35% lymphocytes, 2% monocytes and 1% eosinophils. Hemagglutination was noted and improved with prewarming. The direct antiglobulin test was positive to complement 4+. The titre of cold agglutinins was persistently greater than 1:2048 and the thermal amplitude was reactive in saline and albumin to 37°C. The bilirubin concentration was 86 μmol/L (normally 0–17 μmol/L) and the lactate dehydrogenase concentration was 306 U/L (normally 90–180 U/L). The bone marrow biopsy specimen was hypercellular with no abnormal infiltrates. The chest x-ray film and the CT scan of the abdomen appeared normal.

The patient was given folic acid and a regimen to minimize cold exposure. He failed to respond to chlorambucil and showed minimal responsiveness to prednisone on occasions when hemolysis was severe. His condition was managed in a symptomatic fashion until 1996, when he failed a trial of cyclosporin A. He was reassessed in 1998 and was noted to have an enlarged spleen. Bone marrow aspiration showed a dry tap, and the bone marrow biopsy demonstrated replacement with a small-cleaved follicular centre cell lymphoma. At the time of his reassessment the patient was taking 50 mg of prednisone daily, and his hemoglobin level had improved transiently. A course of oral chlorambucil therapy (4 mg/d) resulted in a drop in his hemoglobin concentration to 51 g/L and was discontinued.

Rituximab therapy (375 mg/m$^2$ weekly for 4 weeks) was begun on Dec. 15, 1999. The dose of prednisone was reduced from 50 mg/d to 30 mg/d alternating with 15 mg/d on alternate days over 4 weeks. Prednisone was withdrawn completely over 4 months. At the time this treatment was initiated, the patient's hemoglobin level was 82 g/L; it increased to 125 g/L by the 18th day after treatment began. One year later his hemoglobin concentration was 93 g/L; the patient was off all treatment and exhibited no symptoms.

This successful induction of remission suggests that rituximab may be an effective treatment for chronic and refractory cold hemagglutinin disease occurring in association with follicular centre cell lymphoma. The use of this agent to treat idiopathic acquired cold hemagglutinin disease requires evaluation.

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### References

1. Lee EJ, Jueck B. Rituxan in the treatment of cold agglutinin disease [letter]. *Blood* 1998; 92(9):3490-1.
2. Layios N, Van Den Neste E, Jost E, Deneys V, Scheiff JM, Ferrant A. Remission of severe cold agglutinin disease after rituximab therapy. *Leukemia* 2001;15(1):187-8.
3. McLaughlin P, Grillo-Lopez AJ, Link BK, Levy R, Czuczman MS, Williams ME, et al. Rituximab chimeric anti-CD20 monoclonal antibody therapy for relapsed indolent lymphoma: half of patients respond to four-dose treatment program. *J Clin Oncol* 1998;16:2825-33.

## *Escherichia coli* infections and hemolytic-uremic syndrome

Each outbreak of verotoxigenic *Escherichia coli* infection renews interest in interventions to prevent the complication of hemolytic-uremic syndrome. Donald Farquhar reviewed in *CMAJ*[1] a paper by Wong and colleagues that raises important concerns about risk factors for the progression to hemolytic-uremic syndrome.[2] Although the authors' concerns about antibiotic use in this context may be valid, it is critical that their conclusions not dissuade investigators from performing prospective, controlled antibiotic studies.

Wong and colleagues concluded that the association between antibiotic use and progression to hemolytic-uremic syndrome was strong, but the 95% confidence interval of the adjusted relative risk is extremely wide for antibiotic use within the first 3 days after onset of illness (1.4–737).[2] If the next 1 or 2 patients with hemolytic-uremic syndrome had not received an antibiotic, the significance level might not have been maintained in the multivariate analysis. Both youth and the use of antimotility agents did not prove to be risk factors, contrary to previous findings.[3–5] In addition, the authors did not find an association between antibiotic use and progression to hemolytic-uremic syndrome in a previous study with much larger numbers of patients.[5] These discordances could be a function of inadequate patient numbers in the latest study.[2]

Perhaps more importantly, I am concerned that the approach taken to categorize antibiotic use may not have

been appropriate. Antibiotics were initially grouped together then later divided into the categories of cotrimoxazole and β-lactams. When Carter and colleagues concluded 14 years ago that antibiotics could be harmful, they also included all antibiotics regardless of class.[6] Shortly thereafter, my colleagues and I published evidence that a specific group of agents recognized to be effective in shigellosis did not have a detrimental effect.[7] Our subsequent studies indicated that prolonged use of similar agents was associated with a lesser risk of hemolytic-uremic syndrome.[3,4]

One obvious reason for the discrepancies between studies could be the categorization of antibiotics. We initially chose our stratification for shigellosis on the basis that there is considerable evidence that certain antimicrobials do not have any beneficial effect and perhaps have a detrimental effect (for example, antibiotics to which the bacterium is resistant).[8] If shigellosis investigators had pooled all β-lactam agents they may never have seen a benefit attributable to ampicillin, because first-generation oral cephalosporins were ineffective.[9] A wide spectrum of antibiotics may be used to treat patients infected with *E. coli* O157:H7, including erythromycin and metronidazole. Would it be logical to pool such antibiotics or even cephalosporins with cotrimoxazole or ampicillin in analyses, and would they ever be considered as trial agents in a prospective study? Is it logical to pool all medications as shown in Table 1 of the paper by Wong and colleagues?[2] Furthermore, although patient recruitment was delayed, the study by Proulx and colleagues did not show a detrimental effect for cotrimoxazole.[10]

Some in vitro studies have found increased toxin liberation from verotoxigenic *E. coli* isolates exposed to antibiotics.[11,12] While the latter studies continue to be used as arguments against antibiotic use, recent evidence has indicated that the results are considerably dependent on the methodology.[13]

Therefore, there is still a need for a prospective, randomized controlled study of ampicillin and placebo as suggested over a decade ago.[7] This study should include sufficient numbers of patients, and patients should be recruited early in the course of the illness. The argument for choosing ampicillin over cotrimoxazole in such a trial rests with the unknown but theoretical risk of administering a moderately soluble sulfonamide during an evolving nephropathy. Ampicillin resistance among verotoxigenic *E. coli* remains reasonably low in most regions. Without such studies, the role of some antibiotics in protecting against or complicating verotoxigenic *E. coli* infections will continue to be uncertain.

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**References**

1. Farquhar D. *E. coli*, antibiotics and hemolytic-uremic syndrome in children. *CMAJ* 2000; 163(4):438.
2. Wong CS, Jelacic S, Habeeb RL, Watkins SL, Tarr PI. The risk of hemolytic-uremic syndreome after antibiotic treatment of *Escherichia coli* O157:H7 infections. *N Engl J Med* 2000; 342:1930-6.
3. Cimolai N, Carter JE, Morrison BJ, Anderson JD. Risk factors for the progression of *Escherichia coli* O157:H7 enteritis to hemolytic-uremic syndrome. *J Pediatr* 1990;116:589-92.
4. Cimolai N, Basalyga S, Mah DG, Morrison BJ, Carter JE. A continuing assessment of risk factors for the development of *Escherichia coli* O157:H7-associated hemolytic uremic syndrome. *Clin Nephrol* 1994;42:85-9.
5. Bell BP, Griffin PM, Lozano P, Christie DL, Kobayashi JM, Tarr PI. Predictors of hemolytic uremic syndrome in children during a large outbreak of *Escherichia coli* O157:H7 infections. *Pediatrics* 1997;100(1):E12.
6. Carter AO, Borczyk AA, Carlson JAK, Harvey B, Hockin JC, Karmali MA, et al. A severe outbreak of *Escherichia coli* O157:H7-associated colitis in a nursing home. *N Engl J Med* 1987; 317:1496-500.
7. Cimolai N, Anderson JD, Morrison BJ. Antibiotics for *Escherichia coli* O157:H7 enteritis? *J Antimicrob Chemother* 1989;23:807-8.
8. Butler T, Islam MR, Azad MAK, Jones PK. Risk factors for development of hemolytic uremic syndrome during shigellosis. *J Pediatr* 1987; 110:894-7.
9. Nelson JD, Haltalin KC. Comparative efficacy of cephalexin and amipicillin for shigellosis and other types of acute diarrhea in infants and children. *Antimicrob Agents Chemother* 1975;4:415-20.
10. Proulx F, Turgeon JP, Delage G, Lafleur L, Chicoine L. Randomized, controlled trial of antibiotic therapy for *Escherichia coli* O157:H7 enteritis. *J Pediatr* 1991;121:299-303.
11. Karch H, Goroncy-Bermes P, Opferkuch W, Kroll HP, O'Brien A. Subinhibitory concentrations of antibiotics modulate amount of shiga-like toxin produced by *Escherichia coli*. In: Adam D, Hahn H, Opferkuch W, editors. *The influcence of antibiotics on the host–parasite relationship II*. Berlin: Springer-Verlag; 1985. p. 239-45.
12. Walterspeil JN, Ashkenazi S, Morrow AA, Cleary TG. Effect of subinhibitory concentrations of antibiotics on extracellular shiga-like toxin I. *Infection* 1992;20:25-9.
13. Grif K, Dierich MP, Karch H, Allerberger F. Strain-specific differences in the amount of Shiga toxin released from enterohemorrhagic *Escherichia coli* O157 following exposure to subinhibitory concentrations of antimicrobial agents. *Eur J Clin Microbiol Infect Dis* 1998; 17:761-6.

I read with interest Donald Farquhar's summary[1] of a recently published article on the risk of hemolytic-uremic syndrome after antibiotic treatment of *Escherichia coli* infections.[2] I was a bit perplexed by Farquhar's last sentence: "The findings of this study strongly suggest that these drugs should be withheld in children with acute diarrheal illness until stool cultures confirm growth of an organism for which antibiotic therapy is indicated (e.g., *Campylobacter pylori*)."

Did Farquhar mean *Campylobacter jejuni*? *Campylobacter pylori* has been renamed *Helicobacter pylori*. It does not cause a diarrheal illness, nor is it routinely grown from stool cultures.

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**References**

1. Farquhar D. E. coli, antibiotics and hemolytic-uremic syndrome in children. *CMAJ* 2000; 163(4):438.
2. Wong CS, Jelacic S, Habeeb RL, Watkins SL, Tarr PI. The risk of hemolytic-uremic syndreome after antibiotic treatment of *Escherichia coli* O157:H7 infections. *N Engl J Med* 2000; 342:1930-6.

## A view from the front line

As one of many Canadian physicians working at the front line with little immediate hope of replacement, I note with bemusement that Morris Barer, the coauthor of the Barer–Stoddart report, which recommended that medical school enrolment be slashed, has been