The Risk Factors of *Clostridium difficile* Colitis in Colorectal Surgery

Seung Jin Yoo

Department of Surgery, The Catholic University of Korea School of Medicine, Seoul, Korea

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Examined under colonoscopy, *Clostridium difficile* (*C. difficile*) associated colitis shows pseudomembranous colitis findings, and it is a disease that may cause severe watery diarrhea (more than 3 times per day), abdominal pain and fever. The mortality is 1-3%, and it may recur [1]. Therefore, by anticipating the development of pseudomembranous colitis, early diagnosis and following appropriate treatments, the morbidity and mortality could be lowered.

Since the introduction of preoperative bowel preparation, colorectal surgery has improved greatly. The principle is to decrease perioperative bacterial infection by reducing the number of bacteria in the large intestine through the combination of mechanical bowel irrigation and oral antibiotics. Traditionally, postsurgical infection in the colorectal operation could be decreased effectively by the use of laxatives and oral administration of erythromycin and neomycin. The method so called the Nichols-Condon preparation is the administration of cathartics and oral antibiotics, and it has been accepted widely. Presently, most anorectal surgeons (86.5%) still use this method in North America. However, since intravenous injection of antibiotics is reported to be superior to the oral administration of antibiotics, the trend is the change of the administration route. Recently, side effects and complications directly associated with the use of antibiotics have been reported. Although *C. difficile* colitis has been reported rarely, it has been reported up to 5.6% of patients who had complicating colorectal procedures.

Particularly, in the specific subgroup associated with bowel

obstruction symptoms, the incidence of *C. difficile* infection has been reported to be increased to 29% [2]. In geriatric patients who have received colorectal surgery, the cause of the development of *C. difficile* colitis is thought to be the deterioration of host immune system, nonetheless, more comprehensive mechanisms are a subject to study. The reason that oral metronidazole is favored over erythromycin in preoperative treatments is because it effectively reduces *C. difficile* proliferation [2]. As risk factors for *C. difficile* colitis developed after intestinal surgery, albumin value, prothrombin time, duration of cephalosporin and aminoglycoside injection, the duration of the use of antacid, transfusion volume, intraperitoneal abscess, fasting period, and the duration in the intensive care unit have been reported to be significant [1]. Numerous investigators consider the purpose of the use of prophylactic antibiotics prior to surgery as primarily the prevention of surgical wound infection or sepsis and other complications, and the complications such as *C. difficile* colitis may be considered as incidental complications. Most *C. difficile* colitis is cured after conservative treatments. Nonetheless, it has been reported that in severe cases, retention enema using vancomycin was attempted [3]. When planned colorectal surgeries are performed, if mechanical bowel irrigation is performed prior to surgery for the prevention of perioperative infection, intravenous injection of antibiotics once is sufficient [4].

C. difficile colitis is a complication that may develop after colorectal operation in geriatric patients, patients with suppressed immunity, and patients associated with bowel obstruction. The frequency is up to 21% [2]. Once developed, the morbidity and mortality are high, and financial loss is large, and thus best efforts should be made for its prevention and early detection. Therefore, studies to develop the standard bowel irrigation method that could achieve the purpose without causing the rapid change of the intestinal bacterial flora as well as studies on the selection of ideal antibiotics should be conducted continuously.

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Correspondence to: Seung Jin Yoo, M.D.

Department of Surgery, Uijeongbu St. Mary's Hospital, 65-1 Keumo-dong, Uijeongbu 480-130, Korea

Tel: +82-31-820-3023, Fax: +82-31-847-2717

E-mail: yoosj@catholic.ac.kr

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