

Risk Factors for Delayed Recurrence of *Clostridium difficile* Infection

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Clostridium difficile (*C. difficile*) is an anaerobic, gram-positive, spore-forming bacterium, and *C. difficile* infection (CDI) is a common cause of infectious diarrhea and pseudomembranous colitis. The incidence of CDI is increasing worldwide, most likely as a result of the increased use of antibiotics, and the subsequent emergence of hypervirulent strains.¹ In Western countries, the incidence and severity of CDI are also increasing.² Furthermore, recent reports suggest that in Asian countries, *C. difficile* is more prevalent than previously thought, and that the incidence of CDI is also increasing significantly in Korea.^{3,4}

Recurrent CDI occurs either due to relapse (persistence of the same strain of *C. difficile*) or reinfection (acquisition of a new strain of *C. difficile*). The impact of recurrent CDI is significant because it influences the length of hospitalization and the cost of treatment.⁵ In a Canadian study of hospitalized patients, the independent predictors of recurrent CDI were found to be old age, acquisition of CDI during a hospital stay, and length of hospital stay.⁶ In a recent meta-analysis conducted by Garey et al., continued use of antibiotics after diagnosis, concomitant antacid medication, and old age were significant predictors of recurrent CDI.⁷

The risk factors associated with recurrent CDI have been investigated in some studies conducted in Korea.⁸⁻¹⁰ In a

study by Kim et al., of 125 patients that developed *C. difficile*-associated diarrhea, 27 patients (21.6%) experienced one or more recurrence, and the risk factors for the CDI recurrence were identified as advanced age (over 65 years), a serum albumin level below 2.5 g/dL, and concurrent use of proton pump inhibitors.⁸ Jung et al. suggested that a history of surgery is a predictor of recurrence after metronidazole treatment of CDI.⁹ In a study by Ryu et al., patients who received tube feeding were at an increased risk of recurrent CDI.¹⁰ However, in these studies, the recurrence of CDI was evaluated only between weeks and 90 days only.

In the present study,¹¹ the authors investigated the long-term clinical outcomes of CDI in hospitalized patients in a single center. The authors evaluated delayed CDI recurrence after eight weeks of successful treatment response. The predictive factors associated with delayed CDI recurrence were tube feeding, and the use of anti-gastric acid medications. Tube feeding is a known risk factor for CDI because it can act as a transmission factor for *C. difficile*. Aseptic control of the feeding tube may aid in reducing contamination, and therefore preventing CDI. Another important result of this study is the mortality rate of patients with CDI. Although no deaths were attributed to CDI, the results of this study suggest that CDI may predict the poor prognosis of underlying diseases.

As the authors mentioned, this study was limited in that it was retrospective, performed in a single center, and the hypervirulent strain was not evaluated appropriately. Another weak point of this study is that antacid medication history was not clearly defined. It would have been better if the authors had clarified the temporal relationship between ant-

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acid exposure and the development of diarrheal symptoms.

In conclusion, risk factors for delayed recurrence of CDI were identified in the present paper. This study suggests that more sanitary manipulation of feeding tubes may prevent the recurrence of CDI. Further prospective studies with a large number of patients are needed to more accurately elucidate the factors associated with recurrent CDI.

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