Factors predicting adverse events associated with therapeutic colonoscopy for colorectal neoplasia: a retrospective nationwide study in Japan CME

Ryota Niikura, MD, PhD,[1] Hideo Yasunaga, MD, PhD,[2] Atsuo Yamada, MD, PhD,[1] Hiroki Matsui, PhD,[2] Kiyohide Fushimi, MD, PhD,[3] Yoshihiro Hirata, MD, PhD,[1] Kazuhiko Koike, MD, PhD[1]

Tokyo, Japan

Background and Aims: Few large studies have evaluated the adverse events associated with therapeutic colonoscopy for colorectal neoplasia, including bleeding and bowel perforation. Our aim was to investigate factors associated with these events, using a Japanese national inpatient database.

Methods: We extracted data from the nationwide Japan Diagnosis Procedure Combination database for patients who underwent therapeutic colonoscopy for colorectal neoplasia between 2013 and 2014. Therapeutic colonoscopy included endoscopic submucosal dissection (ESD), EMR, and polypectomy. Outcomes included bleeding, perforation, cerebro-cardiovascular events, and in-hospital death. A multivariable logistic regression model was used to evaluate factors associated with bleeding and bowel perforation.

Results: We analyzed 345,546 patients, including 16,812 (4.9%) who underwent ESD, 219,848 (63.6%) who underwent EMR, and 108,886 (31.5%) who underwent polypectomy. The rates of bleeding, bowel perforation, cardiovascular events, cerebrovascular events, and death were 32.5, 0.47, 0.05, 0.88, and 1.32 per 1000 patients, respectively. In the multivariate analysis, a higher bleeding rate was associated with being male, comorbid diseases, ESD, tumor size ≥2 cm, and use of drugs including low-dose aspirin, thienopyridines, non-aspirin antiplatelet drugs, novel oral anticoagulants, warfarin, non-steroidal anti-inflammatory drugs (NSAIDs), and steroids. A higher bowel perforation rate was associated with being male, renal disease, ESD, tumor size ≥2 cm, and drugs including warfarin, NSAIDs, and steroids.

Conclusions: Although the incidence of adverse events after therapeutic colonoscopy was low, several patient-related factors were significantly associated with bleeding and bowel perforation. (Gastrointest Endosc 2016;84:971-82.)

INTRODUCTION

Endoscopic treatment is an established therapy for colorectal neoplasia that can potentially reduce the incidence of colon cancer and cancer-related mortality.[1-3] Therapeutic colonoscopy may, however, cause serious adverse events, such as bleeding, bowel perforation, cerebrovascular events, and death.

Several studies have reported the rates of adverse events associated with endoscopic treatment.[4-9] Most

Abbreviations: ESD, endoscopic submucosal dissection; DPC, Diagnosis Procedure Combination; NSAID, non-steroidal anti-inflammatory drug; NOAC, novel oral anticoagulant; LDA, low-dose aspirin; ICD-10, International Classification of Diseases and Related Health Problems Tenth Revision.

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Current affiliations: Department of Gastroenterology, Graduate School of Medicine, The University of Tokyo, Tokyo (1), Department of Clinical Epidemiology and Health Economics, School of Public Health, The University of Tokyo, Tokyo (2), Department of Health Care Informatics, Graduate School of Medicine, Tokyo Medical and Dental University, Tokyo, Japan (3).

Reprint requests: Atsuo Yamada, Department of Gastroenterology, Graduate School of Medicine, The University of Tokyo, 7-3-1 Hongo, Bunkyo-ku, Tokyo 1138655, Japan.

TABLE 1. Patient characteristics according to therapeutic colonoscopy technique (n = 345,546)

Variables	Endoscopic submucosal dissection (N = 16,812), n (%)	Polypectomy (N = 108,886), n (%)	EMR (N = 219,848), n (%)
Patient-related factors			
Age			
≤50 years	1183 (7.0)	11,174 (10.3)	20,515 (9.3)
51-60 years	2450 (14.6)	18,131 (16.7)	36,290 (16.5)
61-70 years	5650 (33.6)	36,225 (33.3)	75,213 (34.2)
71-80 years	5725 (34.1)	32,904 (30.2)	68,119 (31.0)
≥80 years	1804 (10.7)	10,452 (9.6)	19,711 (9.0)
Sex			
Male	9935 (59.1)	73,289 (67.3)	149,735 (68.1)
Female	6877 (40.9)	35,597 (32.7)	70,113 (31.9)
Comorbidities			
Myocardial infarction	90 (0.54)	737 (0.68)	1485 (0.68)
Congestive heart failure	206 (1.22)	3058 (2.81)	5519 (2.51)
Peripheral vascular disease	71 (0.42)	944 (0.87)	1814 (0.83)
Cerebrovascular disease	303 (1.80)	2722 (2.50)	5470 (2.49)
Dementia	56 (0.33)	442 (0.41)	805 (0.37)
Chronic pulmonary disease	209 (1.24)	1530 (1.41)	3028 (1.38)
Rheumatoid disease	101 (0.60)	662 (0.61)	1284 (0.58)
Peptic ulcer	477 (2.84)	4688 (4.31)	9029 (4.11)
Diabetes without chronic adverse event	1054 (6.27)	8039 (7.38)	16,082 (7.32)
Diabetes with chronic adverse event	161 (0.96)	2018 (1.85)	4008 (1.82)
Hemiplegia or paraplegia	5 (0.030)	44 (0.040)	89 (0.040)
Renal disease	161 (0.96)	2161 (1.98)	4500 (2.05)
Mild liver disease	273 (1.62)	2692 (2.47)	5320 (2.42)
Moderate or severe liver disease	9 (0.054)	216 (0.20)	375 (0.17)
Annual procedure volume			
Very low	4312 (25.6)	33,415 (30.7)	51,608 (23.5)
Low	4290 (25.5)	26,352 (24.2)	54,891 (25.0)
High	4200 (25.0)	26,151 (24.0)	55,297 (25.1)
Very high	4010 (23.9)	22,968 (21.1)	58,052 (26.4)
Tumor-related factors			
Tumor size			
<2 cm	0	35,936 (33.0)	4 (0.01)
≥2 cm	16,812 (100)	72,950 (67.0)	219,844 (99.99)
Drug use			
Single-drug regimens			
Low-dose aspirin	364 (2.2)	1918 (1.8)	3487 (1.6)
Thienopyridines	162 (1.0)	930 (0.9)	1700 (0.8)
Non-aspirin antiplatelet drug	220 (1.3)	1278 (1.2)	2304 (1.0)
NOAC	56 (0.3)	332 (0.3)	526 (0.2)
Warfarin	251 (1.5)	2000 (1.8)	3663 (1.7)
NSAID	891 (5.3)	4494 (4.1)	7777 (3.5)
Steroid	165 (1.0)	1222 (1.1)	2114 (1.0)

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