doi: 10.13241/j.cnki.pmb.2019.22.016

结肠腺瘤发生的危险因素及和幽门螺杆菌感染的相关性分析 *

朱疆依[1] 冯 波[2] 梅 琳[1] 孙瑞青[1] 郭长存[1] 孙相钊[3Δ]

(1 空军军医大学第一附属医院消化病医院 消化内科 陕西 西安 710032;
2 空军军医大学第一附属医院心血管医院 心脏外科 陕西 西安 710032;3 广东廉江市人民医院 消化内科 广东 廉江 524400)

摘要 目的:分析结肠腺瘤发生的危险因素及和幽门螺杆菌(*Hp*)感染的相关性。**方法:**选择我院 2018 年 6 月 ~2018 年 12 月收治的 180 例结肠腺瘤患者,同时选择我院接受结肠镜检查无异常者 152 例作为对照组。收集和比较两组患者的一般资料,采用 14C 尿氮呼气试验检测 *Hp* 的感染情况,多因素 Logistic 回归分析结肠腺瘤发生的危险因素。**结果:**多因素 Logistic 逐步回归分析结果显示男性、年龄、体质指数 24 kg/m^2、腹型肥胖、饮酒、吸烟、喜食红肉、喜食果蔬、高脂血症、糖尿病、粪便隐血阳性、肿瘤家族史及 *Hp* 阳性是结肠腺瘤发生的危险因素,喜食果蔬为其发生的保护因素。*HP* 阳性率组腺瘤 >1 cm、腺瘤数目多发、左结肠率高于 *Hp* 阴性组(P<0.05);*Hp* 阳性组和 *Hp* 阴性组肠腺瘤患者腺瘤蒂部分型、腺瘤病理类型比较差异无统计学意义(P>0.05)。**结论:**结肠腺瘤的发生和多种危险因素有关,其中 *Hp* 感染可增加结肠腺瘤发生发展风险,临床应将此类高危人群作为结肠腺瘤的重点筛查对象,以降低结肠癌的潜在发生风险。

关键词:结肠腺瘤;危险因素;幽门螺旋杆菌

中图分类号:R735.35 **文献标识码:**A **文章编号:**1673-6273(2019)22-4278-05

Risk Factors of Colorectal Adenoma and Its Correlation with *Helicobacter Pylori* Infection*

ZHU Jiang-yi[1], FENG Bo[2], MEI Lin[1], SUN Rui-qing[1], GUO Chang-cun[1], SUN Xiang-zhao[3Δ]

(1 Department of Gastroenterology, First Affiliated Hospital of Air Force Military Medical University, Xi'an, Shaanxi, 710032, China; 2 Cardiac Surgery Department, Cardiovascular Hospital, First Affiliated Hospital of Air Force Military Medical University, Xi'an, Shaanxi, 710032, China; 3 Guangdong Lianjiang People's Hospital Digests, Lianjiang, Guangdong, 524400, China)

ABSTRACT Objective: To analyze the risk factors of colorectal adenoma and its correlation with *helicobacter pylori* (*Hp*) infection. **Methods:** 180 patients with colorectal adenoma who were treated from June 2018 to December 2018 and 152 patients who received colonoscopy without abnormality in our hospital were selected as the study group and control group. The general data of the two groups were collected and compared. The Hc infection was detected by 14C urinary nitrogen breath test. The risk factors of colon adenoma were analyzed by multivariate logistic regression. **Results:** Male, age, body mass index of 24 kg/m^2, abdominal obesity, drinking, smoking, like eating red meat, like eating fruits and vegetables, hyperlipidemia, diabetes, fecal occult blood positive, a positive family history of cancer and *Hp* were influencing factors for colorectal adenoma, like eating fruits and vegetables was the protective factors. The HP positive rate group had >1 cm adenoma, multiple adenomas, and the left colon rate was higher than the HP negative group (P<0.05). There was no statistically significant difference in the pathological types of adenoma pedicle type and adenoma in patients with intestinal adenoma between the *Hp* positive group and the *Hp* negative group (P>0.05). **Conclusion:** Colorectal adenoma is related to a variety of risk factors, Hp infection may increase the risk of developing colorectal adenoma. In order to reduce the potential risk of colon cancer, this high-risk group should be the focus of screening for colorectal adenoma.

Key words: Colorectal adenoma; Risk factors; *Helicobacter pylori*

Chinese Library Classification(CLC): R735.35 Document code: A

Article ID: 1673-6273(2019)22-4278-05

前言

结肠腺瘤为临床常见的消化系统肿瘤,为结肠癌的重要癌前病变,临床资料显示[1,2]近年来结肠癌的发生率及死亡率呈上升趋势,而其发生机制尚无明确定论。既往研究认为[3,4]遗传因素、环境改变、饮食结构和癌基因失衡等因素和结肠癌的发生相关。目前,对于结肠癌尚无确切的有效预防方法,研究表明[5,6]尽早发现并及时切除结肠腺瘤可能明显降低结肠癌的发生风险,因此结肠腺瘤的易感和危险因素的研究备受临床关注。

目前研究认为[7]幽门螺旋杆菌(*Hp*)感染不仅和胃溃疡、胃

* 基金项目:陕西省社会发展重点项目(2018ZDXM-SF-053)

作者简介:朱疆依(1981-),女,硕士,主治医师,研究方向:消化道早癌的临床研究,电话:13619250663,E-mail:yangmei8152@163.com

Δ 通讯作者:孙相钊(1965-),男,本科,副主任医师,研究方向:消化道早癌的临床诊断及内镜治疗,幽门螺旋杆菌研究

(收稿日期:2019-06-07 接受日期:2019-06-30)

癌等胃部疾病有关，且和结直肠、胰腺及肝胆等胃外肿瘤有关，但 *Hp* 和结肠腺瘤的关系结论尚存争议。近年来，有研究表明 *Hp* 感染能够增加结肠腺瘤的发生率，但也有研究显示[8]*Hp* 感染和结肠腺瘤发生风险无明显相关性。因此，本研究主要分析了结肠腺瘤发生的危险因素，并观察了结肠腺瘤特征和 *Hp* 感染的关系，以期为预防结肠腺瘤癌变和 *Hp* 根除指征提供更多的参考依据。

1 资料与方法

1.1 研究对象

选择我院 2018 年 6 月 ~2018 年 12 月收治的 180 例结肠腺瘤患者，入选标准[9]：经病史、症状、实验室、内镜和病理组织检查确诊为结肠腺瘤；病例资料完整；经患者知情同意。排除标准：严重心血管、肝肾等原发疾病；炎症肠病；胃肠道手术史；腺瘤癌变或其他部位的恶性肿瘤病史；近 1 个月接受糖皮质激素、抗生素、质子泵抑制剂等药物治疗；接受 *Hp* 根除治疗；自身免疫性病变；妊娠或哺乳期妇女；无法耐受结肠镜检查；结肠镜、胃镜检查禁忌症。180 例患者中，男性 109 例，女性 71 例；年龄 43~76 岁。同时选择我院接受结肠镜检查无异常者 152 例作为对照组(血尿常规正常，近期无急慢性疾病)，男性 60 例，女性 92 例；年龄 38~75 岁。

1.2 方法

1.2.1 资料收集 收集两组研究对象的一般资料：性别、年龄、体质指数 24 kg/m^2、腹型肥胖(男性腰围超过 85 cm，女性腰围超过 80 cm)、饮酒(每天饮酒量超过 50 g，持续饮酒 12 个月以上，或者戒酒时间 <6 个月)、吸烟(每天吸烟量 1 只以上，持续吸烟 12 个月以上，或长时间吸烟但戒烟时间 <6 个月)、喜食红肉、喜食果蔬、高脂血症、糖尿病、高血压、便秘(每周排便次数减少 3 次，排便困难、粪便干硬，病程超过 6 个月)、腹泻(每天排便次数在 3 次以上，粪质稀薄，每日粪便量超过 200 g，病程在 2 个月以上)、粪便隐血阳性、肿瘤家族史、胆囊息肉、阑尾切除和 *Hp* 阳性(14C 尿氮呼气试验检测数值超过 100 dpm/mmol)情况。结肠镜检查时记录结肠腺瘤部位、数目，大小。

1.2.2 结肠腺瘤组织病理学评价 结肠腺瘤经内镜下切除后常规处理样本，用苏木素 - 伊红染色。按照世界卫生组织标准[9]评价切除样本绒毛结构、腺瘤蒂部分型等情况。

1.3 统计学分析

数据处理选用 SPSS18.0 软件包，计量资料用 $(\bar{x}\pm s)$表示，组间比较选用 t 检验，计数资料用[(例)%]表示，组间比较用 x^2 检验或连续矫正比较，对照组和结肠腺瘤组比较有意义的指标纳入多因素 Logistic 逐步回归分析，*P<0.05* 表示差异有统计学意义。

2 结果

2.1 两组临床资料分析

对照组和结肠腺瘤组男性、年龄、体质指数 24 kg/m^2、腹型肥胖、饮酒、吸烟、喜食红肉、喜食果蔬、高脂血症、糖尿病、高血压、便秘、粪便隐血阳性、肿瘤家族史及 *Hp* 阳性率比较差异有统计学意义(*P*<0.05)；两组腹泻、胆囊息肉、阑尾切除率比较差异无统计学意义(*P*>0.05)，见表 1。

2.2 结肠腺瘤发生的多因素分析

将男性、年龄、体质指数 24kg/m^2、腹型肥胖、饮酒、吸烟、喜食红肉、喜食果蔬、高脂血症、糖尿病、高血压、便秘、粪便隐血阳性、肿瘤家族史及 *Hp* 阳性作为自变量进行多因素 Logistic 逐步回归分析，结果显示男性、年龄、体质指数 24 kg/m^2、腹型肥胖、饮酒、吸烟、喜食红肉、喜食果蔬、高脂血症、糖尿病、粪便隐血阳性、肿瘤家族史及 *Hp* 阳性为结肠腺瘤发生的危险因素，喜食果蔬为其发生的保护因素。

2.3 结肠腺瘤各亚组间 *Hp* 感染情况比较

Hp 阳性率组腺瘤 >1 cm、腺瘤数目多发、左结肠率高于 *Hp* 阴性组，比较差异有统计学意义(*P*<0.05)，腺瘤蒂部分型、腺瘤病理类型比较差异无统计学意义(*P*>0.05)，见表 3。

3 讨论

研究表明结肠腺瘤能够进一步发展为结肠癌，充分了解结肠腺瘤的发生发展规律并早期干预对结肠癌的一级预防和早期诊断有重要的指导价值[10,11]。性别作为结肠腺瘤发生的风险因素在临床研究中有一定争议，有关研究报道[12]结肠镜检查发现男性发生率高于女性，但也有研究认为[13]结肠腺瘤和性别无关。本研究结果显示结肠腺瘤组男性比例较女性高，故认为性别和结肠腺瘤发生有一定关联，但此结论仍有待大样本流行病学研究证实。年龄可能是结肠腺瘤发生的另一危险因素，国外研究建议[4-15]年龄超过 50 岁者应每年进行结肠镜检查，以提高临床对结肠肿物的发现率。

肥胖可促进机体雌激素的表达，降低胰岛素敏感性，从而增加肿瘤的发生风险。本研究结果显示结肠腺瘤组质指数 24 kg/m^2、腹型肥胖率相对较高。生活方式及饮食习惯和结肠腺瘤发生的关系尚存争议，其中饮酒、吸烟是结肠腺瘤相对公认的危险因素，烟酒中的刺激物质能够直接作用于结肠黏膜或循环系统，增加腺瘤发生的可能性[16,17]。少食红肉、喜食果蔬则可减少结肠腺瘤的发生风险。本研究也证实了饮酒、吸烟、喜食红肉和果蔬与结肠腺瘤发生的关系。高脂血症、糖尿病、高血压和结肠腺瘤的发生发展有良好关系，临床研究普遍认同糖尿病为结肠腺瘤发生的危险因素之一[18,19]。本研究中，结肠腺瘤组糖尿病率相对较高，和 Klare P 等[20]研究结果相似。血脂代谢产物可诱导细胞增殖，参与 DNA 损伤，从而引起结肠腺瘤的形成，本研究结果显示高脂血症为结肠腺瘤发生的独立危险因素。此外，本研究结果显示血压上升和结肠腺瘤之间无明显相关性，但目前有关此类报道较少，因此二者之间的作用机制有待进一步探讨。有研究认为[21-22]便秘可能是结肠癌发生的高危因素，便秘导致有害物质积聚肠腔，难以排出体外，损伤肠粘膜，反复修复、愈合，引起肠粘膜表层上皮细胞 DNA 变化，形成腺瘤，导致癌变。另外，粪便隐血试验阳性能够高度提示结肠腺瘤发生可能性[23]。研究表明[24]部分结肠癌患者具有遗传易感性或遗传性，有结肠腺瘤家族史患者腺瘤发生率明显上升。本研究中，肿瘤家族史是结肠腺瘤发生的高危因素，可能与细胞恶性转化和遗传物质的不稳定性有关，DNA 染色体改变明显增加致癌物质的敏感作用，影响 DNA 正常复制，导致肿瘤发生[25,26]。

既往研究已证实[27]*Hp* 感染和胃部疾病有关，其作为一种微厌氧、螺旋形细菌，有较强的感染能力。近年来相关研究报

表 1 两组临床资料分析[$\bar{x}\pm s$,例(%)]

Table 1 Analysis of the clinical data of two groups [$\bar{x}\pm s$, case (%)]

Factor	Control group(n=152)	Colorectal adenoma group (n=180)	x^2/t	*P*
Gender				
Male / Female	60/92	109/71	13.824	0.000#
Age	43.82± 5.49	52.05± 6.48	12.355	0.000
Body mass index ≥ 24 kg/m^2	27	58	8.302	0.004#
Abdominal obesity	18	41	6.017	0.014#
Drinking	75	130	17.309	0.000#
Smoking	70	126	18.565	0.000#
Eat red meat	30	72	17.935	0.000#
Eating fruits and vegetables	38	81	13.478	0.000#
Hyperlipidemia	28	59	8.057	0.005#
Diabetes	13	36	7.698	0.006#
Hypertension	15	29	6.949	0.008#
Constipation	10	27	5.082	0.024#
Diarrhea	44	60	0.547	0.459#
Fecal occult blood positive	53	84	4.259	0.039#
Family history of cancer	27	54	6.043	0.014#
Gallbladder polyps	17	23	0.076	0.783#
Appendectomy	27	38	0.393	0.531#
Hp positive	45	126	52.232	0.000#

for continuous correction

表 2 结肠腺瘤发生的多因素分析

Table 2 Multivariate analysis of colorectal adenoma

Independent variable	β	S.E	Wald	*P*	OR	95%CI
Male	1.381	0.495	7.795	0.005	3.979	1.509~10.490
Age	1.322	0.399	10.988	0.001	3.753	1.717~8.202
Body mass index ≥ 24 kg/m^2	0.982	0.201	10.840	0.001	2.669	1.810~3.959
Abdominal obesity	1.239	0.574	4.661	0.031	3.453	1.121~10.636
Drinking	1.441	0.629	5.245	0.022	4.226	1.231~14.508
Smoking	0.565	0.233	7.606	0.005	1.759	1.114~2.777
Hyperlipidemia	0.846	0.268	6.284	0.012	2.330	1.378~3.940
Diabetes	0.708	0.201	5.247	0.024	2.029	1.368~3.010
Hypertension	0.083	1.076	0.006	0.938	1.087	0.132~8.951
Constipation	0.226	0.525	0.186	0.666	1.254	0.448~3.510
Eat red meat	0.593	0.280	4.849	0.028	1.809	1.045~3.132
Eating fruits and vegetables	-0.133	0.021	39.578	<0.001	0.875	0.840~0.912
Family history of cancer	0.542	0.053	103.710	<0.001	1.719	1.549~1.908
Fecal occult blood positive	1.152	0.299	14.873	<0.001	3.614	1.762~5.682
Hp positive	0.256	0.098	6.879	0.009	1.292	1.067~1.564

表 3 结肠腺瘤各亚组间 *Hp* 感染情况比较[例(%)]

Table 3 Comparison of the *Hp* infection among each subgroup of colorectal adenoma [case (%)]

Factor	Hp positive(n=126)	Hp negative(n=54)	x^2	*P*
Adenoma size (cm)				
<1	5	10	13.487	0.002
1~2	103	42		
>2	18	2		
Number of adenomas				
Single shot	35	38	26.705	0.000#
Multiple	91	16		
Growth site				
Right colon	46	31	5.918	0.015#
Left colon	80	23		
Adenoma pedicle type				
No pedi	36	12	0.488	0.485#
Tidy	90	42		
Adenoma pathology type				
Fluffy	45	15	0.744	0.388#
No fluff	81	39		

for continuous correction.

道[28]*Hp* 感染和结肠腺瘤有一定关系,并表明 *Hp* 感染可刺激宿主胃癌细胞的免疫炎症反应,促进血清胃泌素的表达,从而刺激结肠黏膜生长营养因子,利于胃肠道黏膜细胞的增殖,增加结肠腺瘤的发生风险。世界卫生组织已将 *HP* 作为致癌危险因子[29]。Nam JH 等[30]通过研究发现,结肠腺瘤者 *Hp* 感染率较正常这高。但有研究并不支持 *Hp* 感染和结肠腺瘤的发生相关[31]。本研究结果显示结肠腺瘤组 *Hp* 阳性率明显高于对照组,多因素 Logistic 逐步回归分析显示 *Hp* 感染是结肠腺瘤发生的独立危险因素,证实 *Hp* 感染和结肠腺瘤的发生有一定相关性。但目前有关 *Hp* 感染和结肠腺瘤临床特征的关系尚存争议,*Hp* 感染者结肠腺瘤多位于左半结肠,本研究结果显示 *Hp* 阳性者左半结肠腺瘤率高于右半结肠。进一步分析发现结肠腺瘤 >1 cm 和多发性 *Hp* 阳性比例也显著高于结肠腺瘤 <1 cm 和单发性,提示 *Hp* 感染能够增加结肠腺瘤直径和数目,加大临床治疗难度,因此可能影响结肠腺瘤预后,和既往研究结果一致[32]。

综上所述,结肠腺瘤的发生和多种危险因素有关,*Hp* 感染可增加结肠腺瘤发生风险,临床应将此类高危人群作为结肠腺瘤的重点筛查对象,以降低结肠癌的潜在风险。

参 考 文 献(References)

[1] Ze EY, Kim BJ, Jun DH, et al. The Fatty Liver Index: A Simple and Accurate Predictor of Colorectal Adenoma in an Average-Risk Population[J]. Dis Colon Rectum, 2018, 61(1): 36-42

[2] Colussi D, Fabbri M, Zagari RM, et al. Lifestyle factors and risk for colorectal polyps and cancer at index colonoscopy in a FIT-positive screening population[J]. United European Gastroenterol J, 2018, 6(6): 935-942

[3] Mouchli MA, Ouk L, Scheitel MR, et al. Colonoscopy surveillance for high risk polyps does not always prevent colorectal cancer[J]. World J Gastroenterol, 2018, 24(8): 905-916

[4] David Y, Ottaviano L, Park J, et al. Confounders in Adenoma Detection at Initial Screening Colonoscopy: A Factor in the Assessment of Racial Disparities as a Risk for Colon Cancer [J]. J Cancer Ther, 2019, 10(4): 269-289

[5] Karsenti D, Tharsis G, Burtin P, et al. Adenoma and advanced neoplasia detection rates increase from 45 years of age [J]. World J Gastroenterol, 2019, 25(4): 447-456

[6] Bevan R, Blanks RG, Nickerson C, et al. Factors affecting adenoma detection rate in a national flexible sigmoidoscopy screening programme: a retrospective analysis[J]. Lancet Gastroenterol Hepatol, 2019, 4(3): 239-247

[7] Witold K, Anna K, Maciej T, et al. Adenomas - Genetic factors in colorectal cancer prevention[J]. Rep Pract Oncol Radiother, 2018, 23 (2): 75-83

[8] Shmuely H, Melzer E, Braverman M, et al. Helicobacter pylori infection is associated with advanced colorectal neoplasia[J]. Scand J Gastroenterol, 2014, 49(4): 516-517

[9] IJspeert JE, de Wit K, van der Vlugt M, et al. Prevalence, distribution and risk of sessile serrated adenomas/polyps at a center with a high adenoma detection rate and experienced pathologists[J]. Endoscopy, 2016, 48(8): 740-746

[10] Kim SJ, Kim BJ, Kang H. Measurement of biological age may help to assess the risk of colorectal adenoma in screening colonoscopy [J]. World J Gastroenterol, 2017, 23(37): 6877-6883

[11] Kumar A, Kim M, Lukin DJ. *Helicobacter pylori* is associated with increased risk of serrated colonic polyps: Analysis of serrated polyp

risk factors[J]. Indian J Gastroenterol, 2018, 37(3): 235-242

[12] Kim NH, Jung YS, Park JH, et al. Risk of developing metachronous advanced colorectal neoplasia after colonoscopic polypectomy in patients aged 30 to 39 and 40 to 49 years [J]. Gastrointest Endosc, 2018, 88(4): 715-723

[13] Tate DJ, Desomer L, Awadie H, et al. EMR of laterally spreading lesions around or involving the appendiceal orifice: technique, risk factors for failure, and outcomes of a tertiary referral cohort (with video)[J]. Gastrointest Endosc, 2018, 87(5): 1279-1288.e2

[14] Ganschow P, Trauth S, Hinz U, et al. Risk Factors Associated With Pouch Adenomas in Patients With Familial Adenomatous Polyposis [J]. Dis Colon Rectum, 2018, 61(9): 1096-1101

[15] Adán Merino L, Mercedes AM, Jose BA, et al. Factors related to colorectal cancer in advanced adenomas and serrated polyps: a further step toward individualized surveillance [J]. Eur J Gastroenterol Hepatol, 2018, 30(11): 1337-1343

[16] Colizzo J, Keshishian J, Kumar A, et al. Colonic stasis and chronic constipation: Demystifying proposed risk factors for colon polyp formation in a spinal cord injury veteran population[J]. J Spinal Cord Med, 2018, 41(3): 292-297

[17] Tollivoro TA, Jensen CD, Marks AR, et al. Index colonoscopy-related risk factors for postcolonoscopy colorectal cancers [J]. Gastrointest Endosc, 2019, 89(1): 168-176.e3

[18] Rösch T, Altenhofen L, Kretschmann J, et al. Risk of Malignancy in Adenomas Detected During Screening Colonoscopy [J]. Clin Gastroenterol Hepatol, 2018, 16(11): 1754-1761

[19] Kumar A, Kim M, Lukin DJ. Helicobacter pylori is associated with increased risk of serrated colonic polyps: Analysis of serrated polyp risk factors[J]. Indian J Gastroenterol, 2018, 37(3): 235-242

[20] Klare P, Phlipsen H, Haller B, et al. Longer observation time increases adenoma detection in the proximal colon - a prospective study[J]. Endosc Int Open, 2017, 5(12): E1289-E1298

[21] He X, Wu K, Ogino S, et al. Association Between Risk Factors for Colorectal Cancer and Risk of Serrated Polyps and Conventional Adenomas[J]. Gastroenterology, 2018, 155(2): 355-373.e18

[22] Yun GY, Moon HS, Kwon IS, et al. Left-Sided Colectomy: One of the Important Risk Factors of Metachronous Colorectal Adenoma After Colectomy for Colon Cancer [J]. Dig Dis Sci, 2018, 63 (4): 1052-1061

[23] Wilkins T, McMechan D, Talukder A, et al. Colorectal Cancer Screening and Surveillance in Individuals at Increased Risk [J]. Am Fam Physician, 2018, 7(2): 111-116

[24] Im JP, Kim D, Chung SJ, et al. Visceral obesity as a risk factor for colorectal adenoma occurrence in surveillance colonoscopy [J]. Gastrointest Endosc, 2018, 88(1): 119-127.e4

[25] Pyo JH, Ha SY, Hong SN, et al. Identification of risk factors for sessile and traditional serrated adenomas of the colon by using big data analysis[J]. J Gastroenterol Hepatol, 2018, 33(5): 1039-1046

[26] Park CH, Kim NH, Park JH, et al. Individualized colorectal cancer screening based on the clinical risk factors: beyond family history of colorectal cancer[J]. Gastrointest Endosc, 2018, 88(1): 128-135

[27] Hu KC, Wu MS, Chu CH, et al. Hyperglycemia combined *Helicobacter pylori* infection increases risk of synchronous colorectal adenoma and carotid artery plaque [J]. Oncotarget, 2017, 8 (65): 108655-108664

[28] Nam JH, Hong CW, Kim BC, et al. Helicobacter pylori infection is an independent risk factor for colonic adenomatous neoplasms [J]. Cancer Causes Control, 2017, 28(2): 107-115

[29] Maruoka D, Arai M, Ishigami H, et al. Sporadic nonampullary duodenal adenoma/carcinoma is associated with not only colonadenoma/carcinoma but also gastric cancer: association of location of duodenal lesions with comorbid diseases [J]. Scand J Gastroenterol, 2015, 50(3): 333-340

[30] Nam JH, Hong CW, Kim BC, et al. *Helicobacter pylori* infection is an independent risk factor for colonic adenomatous neoplasms [J]. Cancer Causes Control, 2017, 28(2): 107-115

[31] Fischbach W, Elsome R, Amlani B. Characteristics of right-sided colonic neoplasia and colonoscopy barriers limiting their early detection and prognosis: a review of the literature [J]. Expert Rev Gastroenterol Hepatol, 2018, 12(6): 585-596

[32] Gupta S, Jacobs ET, Baron JA, et al. Risk stratification of individuals with low-risk colorectal adenomas using clinical characteristics: a pooled analysis[J]. Gut, 2017, 66(3): 446-453