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ABOUT COVER

AIMS AND SCOPE

The primary aim of *World Journal of Gastrointestinal Oncology* (*WJGO*, *World J Gastrointest Oncol*) is to provide scholars and readers from various fields of gastrointestinal oncology with a platform to publish high-quality basic and clinical research articles and communicate their research findings online.

WJGO mainly publishes articles reporting research results and findings obtained in the field of gastrointestinal oncology and covering a wide range of topics including liver cell adenoma, gastric neoplasms, appendiceal neoplasms, biliary tract neoplasms, hepatocellular carcinoma, pancreatic carcinoma, cecal neoplasms, colonic neoplasms, colorectal neoplasms, duodenal neoplasms, esophageal neoplasms, gallbladder neoplasms, *etc*.

INDEXING/ABSTRACTING

The *WJGO* is now abstracted and indexed in PubMed, PubMed Central, Science Citation Index Expanded (SCIE, also known as SciSearch®), Journal Citation Reports/Science Edition, Scopus, Reference Citation Analysis, China Science and Technology Journal Database, and Superstar Journals Database. The 2024 edition of Journal Citation Reports® cites the 2023 journal impact factor (JIF) for *WJGO* as 2.5; JIF without journal self cites: 2.5; 5-year JIF: 2.8; JIF Rank: 71/143 in gastroenterology and hepatology; JIF Quartile: Q2; and 5-year JIF Quartile: Q2. The *WJGO*'s CiteScore for 2023 is 4.2 and Scopus CiteScore rank 2023: Gastroenterology is 80/167; Oncology is 196/404.

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Characteristics and risk factor analyses of high-grade intraepithelial neoplasia in older patients with colorectal polyps

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Abstract

BACKGROUND

According to the degree of intradermal neoplasia in the colorectal exhalation, it can be divided into two grades: Low-grade intraepithelial neoplasia (LGIN) and high-grade intraepithelial neoplasia (HGIN). Currently, it is difficult to accurately diagnose LGIN and HGIN through imaging, and clinical diagnosis depends on postoperative histopathological diagnosis. A more accurate method for evaluating HGIN preoperatively is urgently needed in the surgical treatment and nursing intervention of colorectal polyps.

AIM

To explore the characteristics and risk factors of HGIN in older patients with colorectal polyps.

METHODS

We selected 84 older patients diagnosed with HGIN as the HGIN group (n = 95 colonic polyps) and 112 older patients diagnosed with LGIN as the LGIN group (n = 132 colonic polyps) from Shandong Provincial Hospital Affiliated to Shandong First Medical University. The endoscopic features, demographic characteristics, and clinical manifestations of the two patient groups were compared, and a logistic regression model was used to analyze the risk factors for HGIN in these patients.

RESULTS

The HGIN group was older and had a higher number of sigmoid colon polyps, rectal polyps, pedunculated polyps, polyps ≥ 1.0 cm in size, polyps with surface

congestion, polyps with surface depression, and polyps with villous/tubular adenomas, a higher proportion of patients with diabetes and a family history of colorectal cancer, patients who experienced rectal bleeding or occult blood, patients with elevated carcinoembryonic antigen (CEA) and cancer antigen 199 (CA199), and lower nutritional levels and higher frailty levels. The polyp location (in the sigmoid colon or rectum), polyp diameter (≥ 1.0 cm), pathological diagnosis of (villous/tubular adenoma), family history of colorectal cancer, rectal bleeding or occult blood, elevated serum CEA and CA199 levels, lower nutritional levels and higher frailty levels also are independent risk factors for HGIN.

CONCLUSION

The occurrence of high-grade neoplastic transformation in colorectal polyps is closely associated with their location, size, villous/tubular characteristics, family history, elevated levels of tumor markers, and lower nutritional levels and higher frailty levels.

Key Words: Elderly; Colorectal polyps; High-grade intraepithelial neoplasia; Low-grade intraepithelial neoplasia; Risk factors

Core Tip: Elderly patients diagnosed with colorectal polyps admitted to our hospital from January 2021 to December 2023 were included in the study. High-grade intraepithelial neoplasia characteristics and risk factors of elderly colorectal polyps were analyzed, to provide references for early screening, monitoring and treatment of colorectal polyps in the elderly. Studies have found that the occurrence of high-grade neoplasia in colorectal polyps is closely related to its location, size, villous characteristics, family history, and increased level of tumor markers. Based on these factors, it was found that the early diagnosis and treatment of patients with colorectal polyps could be made, which is of great significance to prevent high-grade neoplasia and even further malignant transformation of polyps in these patients.

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INTRODUCTION

Colorectal polyps are common in older adults, with an incidence rate of approximately 10%-15%, and carry a high risk of malignancy[1,2]. Colorectal polyps can be classified into low-grade intraepithelial neoplasia (LGIN) and high-grade intraepithelial neoplasia (HGIN), based on the degree of intraepithelial neoplasia. LGIN represents a lower-degree lesion, whereas HGIN is characterized by severe dysplasia, many of which have already progressed to carcinoma *in situ*[3]. Although both LGIN and HGIN require early and aggressive surgical resection, the tissue structure and cytological abnormalities between the two grades, with a higher risk of malignancy or carcinoma *in situ* in HGIN. Therefore, surgical strategies and perioperative nursing interventions for HGIN differ significantly from those for LGIN[4]. LGIN and HGIN require different surgical management strategies and perioperative interventions. Currently, accurate diagnosis of LGIN and HGIN through imaging remains challenging, necessitating reliance on postoperative histopathological diagnosis in clinical practice[5]. Improving the preoperative assessment of HGIN is crucial in addressing the urgent need for effective surgical treatment and perioperative care for colorectal polyps, with the aim of enhancing prognosis and improving patients' quality of life. Therefore, this study focused on older patients diagnosed with colorectal polyps and treated at our hospital between January 2021 and December 2023. This study aimed to analyze the characteristics and risk factors of HGIN in older patients with colorectal polyps to provide valuable insights for the early screening, monitoring, and treatment of colorectal polyps.

MATERIALS AND METHODS

General data

The HGIN group included 84 older patients with colorectal polyps graded as HGIN treated at the Department of Gastroenterology, Shandong Provincial Hospital Affiliated to Shandong First Medical University between January 2021 and December 2023, with a total of 95 polyps. To ensure sample balance, 112 patients were randomly selected from 457 older patients with colorectal polyps graded as LGIN and treated during the same period, resulting in a total of 132 polyps in the LGIN group. Both groups were classified based on the postoperative histopathological examination results, which served as the gold standard for grouping. The study protocol was approved by the Medical Ethics Committee of Shandong Provincial Hospital Affiliated to Shandong First Medical University.

Inclusion criteria: Age ≥ 65 years; histopathological examination performed after surgery to determine the grade of the upper fatigue tumor (In line with the diagnostic criteria of colorectal polyps in the "World Health Organization classification of tumors: Pathology and genetics of digestive system tumors"[6]); absence of communication barriers; and signed informed consent from patients and their families.

Exclusion criteria: Other serious digestive system diseases; history of radiotherapy, chemotherapy, or malignant tumor diseases; hematological diseases (*e.g.*, leukemia, hemophilia, and anemia); severe kidney, heart or cerebrovascular diseases; and incomplete basic data.

Index and method

Data on patient demographics, polyp characteristics, clinical symptoms, serum tumor marker levels, and health status indicators were collected.

General information: The following clinical characteristics of the patients were collected by issuing a general information questionnaire, age (years), sex (male/female), smoking history (yes/no), alcohol consumption history (yes/no), family history of colorectal cancer (yes/no), history of diabetes (yes/no), and history of hypertension (yes/no).

Colonoscopy was performed using the Olympus electronic endoscope models CF-HQ290, CF-H290, and CF-H260AI. The examiner prescribed each patient a laxative to empty the colon 1 day before the examination to ensure the effectiveness of the colonoscopy. During the examination, the examinee was placed in the left lateral position and administered intravenous anesthesia. Each patient initially underwent a digital rectal examination to check for anal lesions. The colonoscope was then inserted through the patient's anus, gas was injected, and the entire colon was sequentially examined from the anus to the cecum to observe the condition of the patient's intestines. The characteristics of the polyps, including location, size, color, and surface morphology, were recorded. Immunohistochemical staining was performed for the histopathological examination of the tissues, and polyp specimens, including the polyp stalk and base mucosa. Paraffin embedding and sectioning techniques were used, followed by staining with hematoxylin and eosin for microscopic observation of the polyp specimen tissue morphology to determine the pathological classification of the polyps.

Clinical symptoms assessment: We developed a clinical symptom assessment form that was completed by patients and collected information on whether the patient has symptoms such as rectal bleeding/occult blood, constipation, abdominal pain/distention, or diarrhea.

Serum tumor markers: The patients fasted for 8 hours, and 5 mL of venous blood were collected. Blood was centrifuged at 3000 rpm for 15 minutes and the supernatant was obtained. Enzyme-linked immunosorbent assay was performed to detect tumor marker levels including carcinoembryonic antigen (CEA), cancer antigen 724 (CA724), cancer antigen 199 (CA199), and cancer antigen 242 (CA242) in the patient's serum.

Health status assessment: Senior nurses who have obtained qualification in comprehensive assessment of older adults, have practical experience in comprehensive assessment of older adults, and have passed the assessment evaluated patients' nutritional risk levels using the Mini Nutritional Assessment Short Form (MNA-SF) and the Frailty Assessment Scale (Fatigue, Resistance, Ambulation, Illness, and Loss of Weight Index, FRAIL).

Statistical analysis

Data were analyzed using the statistical software SPSS 21.0. Descriptive statistics of continuous variables such as age, MNA-SF, and FRAIL index are presented as the mean ± SD. Differences between the two groups were analyzed using a *t*-test. Categorical data are described as frequencies (%), and comparisons were made using the χ^2 test. Logistic regression analysis was conducted, incorporating variables that were significantly different between the two groups to explore the risk factors for advanced epithelial dysplasia in colorectal polyps. Statistical significance was set at $P < 0.05$.

RESULTS

Comparison of general data

The general demographic comparison results of the two groups of patients are shown in Table 1. The mean age in the HGIN group was higher than that in the LGIN group ($P < 0.05$). Patients with a history of diabetes and a family history of colorectal cancer had a higher incidence of HGIN ($P < 0.05$). There were no significant differences between the two groups in terms of sex, smoking history, alcohol consumption history, history of hypertension, or number of polyps (all $P > 0.05$).

Comparison of polyp characteristics between the HGIN group and the LGIN group

The statistical comparison of polyp characteristics between the HGIN group and the LGIN group is presented in Table 2. In the HGIN group, polyps were more frequently located in the sigmoid colon and rectum, were sessile, had a cross-sectional area ≥ 1 cm^2, exhibited surface congestion, surface depression, and had a higher proportion of villous/tubulovillous adenomatous polyps, all of which differed significantly from the LGIN group (all $P < 0.05$).

Table 1 Comparison of population characteristics between high-grade intraepithelial neoplasia group and low-grade intraepithelial neoplasia group, *n* (%)

Population characteristics	HGIN group (number of cases = 84)	LGIN group (number of cases = 112)	t/χ^2	*P* value
Age (years old)	74.7 ± 6.8	71.4 ± 5.0	3.916	0.000
Sex			0.500	0.479
Male	50 (59.52)	61 (54.46)		
Female	34 (40.48)	51 (45.54)		
Smoking			1.088	0.297
Yes	32 (38.1)	51 (45.54)		
No	52 (61.9)	61 (54.46)		
Drinking			1.340	0.247
Yes	43 (51.19)	48 (42.86)		
No	41 (48.81)	64 (57.14)		
Family history of colorectal cancer			8.588	0.003
Yes	13 (15.48)	4 (3.57)		
No	71 (84.52)	108 (96.43)		
Diabetes			5.104	0.024
Yes	20 (23.81)	13 (11.61)		
No	64 (76.19)	99 (88.39)		
Hypertension			2.054	0.152
Yes	23 (27.38)	21 (18.75)		
No	61 (72.62)	91 (81.25)		
Number of polyps			2.458	0.117
Solitary	78 (92.86)	96 (85.71)		
Multiple	6 (7.14)	16 (14.29)		

LGIN: Low-grade intraepithelial neoplasia; HGIN: High-grade intraepithelial neoplasia.

Comparison of clinical manifestations between HGIN group and LGIN group

The statistical comparison results of clinical symptom presentations between the HGIN group and the LGIN group are shown in Table 3. The incidence of rectal bleeding/occult blood in the HGIN group is higher than that in the LGIN group ($P < 0.05$). The incidence rates of constipation, abdominal pain/distention, and diarrhea were compared between the two groups (all $P > 0.05$).

The proportion of patients with elevated serum tumor markers in the HGIN group and the LGIN group

Comparison of serum tumor markers in two groups of patients

The proportion of elevated CEA and CA199 levels in the HGIN group was higher than that in the LGIN group ($P < 0.05$). the proportions of elevated CA724 and CA242 levels were also compared, and the results of the comparison are shown in Table 4 (all $P > 0.05$).

Comparison of preoperative health status between the two groups of patients

The comparison of preoperative health status levels between the two groups of patients is shown in Table 5. The MNA-SF score in the HGIN group was lower than that in the LGIN group, and the FRAIL score was higher than that in the LGIN group (all $P < 0.05$).

Multivariate analysis results

The results of the logistic regression analysis on the risk factors for HGIN are shown in Table 6. The analysis indicates that polyps located in the sigmoid colon and rectum, polyp cross-sectional area ≥ 1.0 cm^2, villous tubular adenoma, family history of colorectal cancer, presence of hematochezia/occult blood, elevated CEA, elevated CA199, and a higher FRAIL score was an independent risk factor for the occurrence of HGIN in colorectal polyps [odds ratio (OR) > 1, $P < 0.05$]; a higher MNA-SF score was an independent protective factor for HGIN, (OR < 1, $P < 0.05$).

Table 2 Comparison of polyp characteristics between high-grade intraepithelial neoplasia group and low-grade intraepithelial neoplasia group, *n* (%)

Endoscopic features	HGIN group (number of polyps = 93)	LGIN group (number of polyps = 132)	χ^2	*P* value
Polyp site			26.348	0.000
Ascending colon	10 (10.75)	29 (21.97)		
Transverse colon	9 (9.68)	32 (24.24)		
Descending colon	15 (16.13)	31 (23.48)		
Sigmoid	34 (36.56)	27 (20.45)		
Rectum	25 (26.88)	13 (9.85)		
Endoscopic classification			5.371	0.020
Calyx perpetual	43 (46.24)	41 (31.06)		
Calyx deciduous	50 (53.76)	91 (68.94)		
Polyp cut area	61 (65.59)		10.369	0.001
≥ 1.0 cm^2	61 (65.59)	21 (15.91)		
< 1.0 cm^2	32 (34.41)	111 (84.09)		
Changes in surface color			8.680	0.003
Hyperemia	58 (62.37)	56 (42.42)		
Uncongested	35 (37.63)	76 (57.58)		
Surface depression			8.051	0.005
Yes	21 (22.6)	4 (3.03)		
No	72 (77.4)	128 (96.97)		
Pathological results			24.540	0.000
Canalicular adenoma	62 (66.67)	87 (65.91)		
Villous tubular adenoma	26 (27.96)	12 (9.09)		
Serrated adenoma	2 (2.15)	6 (4.55)		
Non-adenomatous polyps	3 (3.23)	27 (20.45)		

LGIN: Low-grade intraepithelial neoplasia; HGIN: High-grade intraepithelial neoplasia.

DISCUSSION

Colorectal cancer is a common malignant tumor of the digestive tract with a complex pathogenesis involving various genetic and environmental factors. Extensive research has confirmed that colorectal adenomas, particularly tubular and villous adenomatous polyps, are important precursors to colorectal cancer[7-9]. Although the presence of these polyps increases the risk of developing colorectal cancer, it also provides opportunities for early intervention and prevention. Additionally, owing to the potential for prevention and early diagnosis of colorectal cancer, research on its precursors, colorectal polyps, has become particularly important. Studies on colorectal polyps, especially those with HGIN, are crucial for a better understanding of the pathogenesis of colorectal cancer. This information can help optimize early screening and prevention strategies, thereby reducing the incidence and mortality rates of colorectal cancer.

In this study, we conducted a comparative analysis of case data of 84 patients with HGIN and 112 patients with LGIN. It was found that the number of polyps in the sigmoid colon, the number of rectal polyps, the number of pedunculated polyps, and the number of polyps ≥ 1.0 cm in size were significantly higher in the HGIN group compared to the LGIN group. This suggests that the location, size, and abnormal surface features of colorectal polyps may be related to their risk of malignant transformation. Additionally, the patients in the HGIN group were significantly older than those in the LGIN group, which may be related to a decline in bodily and immune functions in older adults. Furthermore, the proportions of patients with diabetes and a family history of colon cancer were significantly higher in the HGIN group than in the LGIN group, as were the proportions of patients with rectal bleeding and occult blood. These findings suggest that factors such as diabetes, family history of colon cancer, and the presence of rectal bleeding or occult blood may be related to the risk of malignant transformation of colorectal polyps. Moreover, serum tumor marker levels are important indicators for assessing the risk of malignancy in colorectal polyps. In this study, it was found that the proportion of patients in the HGIN group with elevated CEA and CA199 was significantly higher than that in the LGIN group, suggesting that increased serum CEA and CA199 may be associated with the malignant transformation of colorectal

Table 3 Comparison of clinical manifestations between high-grade intraepithelial neoplasia group and low-grade intraepithelial neoplasia group, *n* (%)

Clinical manifestation	HGIN group (number of cases = 84)	LGIN group (number of cases = 112)	χ^2	*P* value
Bleeding or occult blood			12.435	0.000
Yes	11 (13.10)	1 (0.89)		
No	73 (86.9)	111 (99.11)		
Constipation			2.904	0.088
Yes	20 (23.81)	16 (14.29)		
No	64 (76.19)	96 (85.71)		
Abdominal pain or abdominal distension			3.477	0.062
Yes	18 (21.43)	13 (11.61)		
No	66 (78.57)	99 (88.39)		
Diarrhea			2.667	0.102
Yes	13 (15.48)	9 (8.04)		
No	71 (84.52)	103 (91.96)		

LGIN: Low-grade intraepithelial neoplasia; HGIN: High-grade intraepithelial neoplasia.

Table 4 The proportion of patients with elevated serum tumor markers in the high-grade intraepithelial neoplasia group and low-grade intraepithelial neoplasia group, *n* (%)

Tumor marker	HGIN group (number of cases = 84)	LGIN group (number of cases = 112)	χ^2	*P* value
CEA			6.212	0.013
Ascension	17 (20.24)	9 (8.04)		
Normal	67 (79.76)	103 (91.96)		
CA724			3.519	0.061
Ascension	6 (7.14)	2 (1.79)		
Normal	78 (92.86)	110 (98.21)		
CA199			13.259	0.000
Ascension	15 (17.86)	3 (2.68)		
Normal	69 (82.14)	109 (97.32)		
CA242			2.890	0.089
Ascension	4 (4.76)	1 (0.89)		
Normal	80 (95.24)	111 (99.11)		

LGIN: Low-grade intraepithelial neoplasia; HGIN: High-grade intraepithelial neoplasia; CA199: Cancer antigen 199; CA724: Cancer antigen 724; CA242: Cancer antigen 242; CEA: Carcinoembryonic antigen.

polyps. Additionally, using a logistic regression model analysis, the following independent risk factors for the development of high-grade neoplastic changes in colorectal polyps were discovered; polyp location being in the sigmoid colon or rectum, polyp diameter ≥ 1.0 cm, histopathological examination showing villous tubular adenoma, a family history of colorectal cancer, the presence of rectal bleeding or occult blood, elevated serum CEA, and elevated serum CA199. These factors significantly contributed to the risk of advanced neoplastic transformation of colorectal polyps.

Owing to their anatomical locations, the sigmoid colon and rectum are more susceptible to chronic irritation and prolonged exposure to carcinogens in feces[10]. Consequently, mucosal cells in these areas undergo frequent cell proliferation and repair processes, which may lead to an increase in DNA replication errors, thereby increasing the potential for mutations[11,12]. Additionally, these anatomical sites have a rich blood supply and lymphatic drainage, which promote the accumulation of inflammatory mediators and growth factors, potentially facilitating the growth and tumorigenesis of polyps. The diameter of a polyp is an important indicator of its malignant potential[13]. Large polyps show

Table 5 Comparison of preoperative health status between high-grade intraepithelial neoplasia group and low-grade intraepithelial neoplasia group

Indicator	HGIN group (number of cases = 84)	LGIN group (number of cases = 112)	*t*	*P* value
MNA-SF	9.85 ± 3.27	11.28 ± 2.29	-2.424	0.018
FRAIL	1.51 ± 1.32	0.46 ± 0.81	4.211	0.000

LGIN: Low-grade intraepithelial neoplasia; HGIN: High-grade intraepithelial neoplasia; FRAIL: Fatigue, resistance, ambulation, illness, and loss of weight index.

Table 6 Logistic regression model analysis

Factor	β	SE	Walds	*P* value	OR	95%CI	
Sigmoid colon polyps or rectal polyps	0.504	0.201	6.287	0.000	1.655	1.116	2.455
Pedicled polyps	0.338	0.311	1.181	0.419	1.402	0.762	2.579
≥ 1.0 cm^2 polyp	0.411	0.195	4.442	0.044	1.508	1.029	2.210
Polyp surface congestion	0.392	0.311	1.589	0.295	1.480	0.804	2.723
Polyp surface depression	0.604	0.381	2.513	0.185	1.829	0.867	3.860
Villous tubular adenoma	0.477	0.231	4.264	0.048	1.611	1.025	2.534
Age	0.409	0.304	1.810	0.215	1.505	0.830	2.731
Diabetes	0.281	0.261	1.159	0.421	1.324	0.794	2.209
Family history of colon cancer	0.633	0.295	4.604	0.042	1.883	1.056	3.358
Bleeding or occult blood	0.295	0.130	5.149	0.034	1.343	1.041	1.733
Elevated CEA	0.403	0.188	4.595	0.045	1.496	1.035	2.163
Elevated CA199	0.295	0.127	5.396	0.017	1.343	1.047	1.723
MNA-SF	-0.729	0.391	9.272	0.000	0.814	0.695	0.989
FRAIL	0.211	0.436	7.367	0.000	1.493	1.141	1.765
Constant term	1.332	0.914	2.124	0.167	3.789	0.632	22.724

OR: Odds ratio; MNA-SF: Mini nutritional assessment short form; CA199: Cancer antigen 199; CEA: Carcinoembryonic antigen; FRAIL: Fatigue, resistance, ambulation, illness, and loss of weight index.

more active cell division, which increases the chances of genetic mutations and may subsequently lead to tumorigenesis. Furthermore, larger polyps often have more complex tissue structures, including atypical hyperplasia, which is a precursor of tumorigenesis[14]. Additionally, villous tubular adenomas, owing to their unique cellular morphology and structure, have a higher malignant potential than other types of polyps. They exhibit rapid cell proliferation and notable cellular atypia, making them susceptible to genetic mutations[15]. Family history reflects genetic susceptibility, and individuals with a positive family history may carry specific genetic mutations such as mutations in the *APC* gene. These genetic factors, possibly in conjunction with non-genetic environmental factors, may promote the development and malignant transformation of polyps[16].

As polyps proliferate, the blood vessels on their surfaces multiply and expand to meet the nutritional and oxygen needs of the proliferating tissues. These newly formed blood vessels often have incomplete structures and thin walls, making them more prone to damage, and consequently more likely to bleed[17]. Additionally, polyp growth may be accompanied by mild inflammatory responses, which further increase vessel fragility and lead to bleeding. Moreover, cells from HGIN may invade deeper tissue layers, affecting more blood vessels, and consequently leading to bleeding [18]. CEA levels are mainly elevated because of abnormal activity or tumor formation in the intestinal mucosal cells. Although CEA is not a specific marker for colorectal cancer, its elevation in patients with colorectal polyps may indicate an increased risk of malignant transformation[19]. Contrastingly, elevated CA199 levels are usually associated with abnormal glycoprotein expression in tumor cells. This may result from changes in the composition of cell-surface glycoproteins, which could be linked to abnormalities in cell adhesion, migration, and signal transduction, thereby promoting the tumorigenic process[20].

Early intervention is essential to construct a comprehensive multidimensional assessment of diagnostic and nursing care. This allows for accurate evaluation of the care needs of older patients, development of personalized treatment and

rehabilitation plans, and improvement in the efficiency and quality of medical and nursing care. Ultimately, it enhances the quality of life, health status, and functional state of older adults. In this study, the MNA-SF and the FRAIL scores were used to assess the health and nutritional status of the patients. Patients with HGIN had significantly lower nutritional and higher frailty levels than those with LGIN. Additionally, logistic regression analysis showed a significant correlation between the risk of developing HGIN and the health and nutritional status of the patients, suggesting that the assessment of health and nutrition could predict the risk of HGIN occurrence.

The reason for these findings may be that patients with HGIN tend to have more severe colorectal polyps and a higher degree of lesions, which lead to greater intestinal irritation and are more likely to cause intestinal obstruction. Consequently, these patients may experience decreased appetite and impaired digestion, resulting in malnutrition or other nutritional risks, and may exhibit a more severe physical function decline.

This study had some limitations. First, the retrospective nature of the study and the limited sample size may have led to selection bias. Second, the multivariate analysis utilized in the study may not include all possible factors.

CONCLUSION

The occurrence of high-grade transformations in colorectal polyps is closely associated with their location, size, villous characteristics, family history, and elevated levels of tumor markers. Additionally, these conditions can manifest as decreased nutritional status and weakened physical function. Therefore, based on these factors, it is crucial to proactively diagnose and treat patients with colorectal polyps. This is important to prevent high-grade transformations in patients with polyps and other malignancies.

FOOTNOTES

Author contributions: Zhang X and Wang Y were the guarantor and designed the study; Zhang X, Zhu T, and Yuan JH participated in the acquisition, analysis, and interpretation of the data, and drafted the initial manuscript; Zhang X, Ge J and Yuan JH revised the article critically for important intellectual content.

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