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Colonoscopy indications and findings in older adults

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ABSTRACT

Aims: The share of older population is increasing globally. Colonoscopy is a frequently used diagnostic/therapeutic procedure, no study to our knowledge comprehensively examines the indications and findings of colonoscopy in geriatric population. We aimed to reveal these in older adults.

Methods: Colonoscopy procedures performed in older adults (≥65 years), which covered a 5-year period (2017-2022), were analyzed retrospectively. Indications and findings of colonoscopies were assessed. The relationship between the indications and the associated findings was also evaluated on an indication basis.

Results: In the study, 2370 colonoscopy procedures were examined. 27.8% were performed in very old (≥75 years) patients. Colonoscopy was completed in 84.3%. Colon cleansing was not optimal in approximately one-fourth. The frequency of completion of colonoscopies and optimal cleaning were similar in the very old. Iron deficiency anemia (IDA) or fecal occult blood test (FOBT) positivity and screening colonoscopy were the common indications. Regarding indications, IDA-FOBT positivity and bleeding were more frequent, screening colonoscopy, IBD and polyp control were less frequent in the very old group. Colonoscopy was reported as normal in 42.4% of the patients, while polyps (28.3%) and diverticula (17.5%) were the common findings. Among findings tumor, diverticula and solitary rectal ulcer were higher in the very old. IDA -FOBT positivity, bleeding, and colonoscopy performed due to findings of other imaging modalities were related to diagnosis of a tumor.

Conclusion: In this study, we presented the indications and results of colonoscopy in a large number of older patients. The main indications for colonoscopy can be listed as IDA-FOBT positivity, screening colonoscopy and control of previous polyp-tumor. Near one of two colonoscopies were found to be normal, polyps and diverticula were the major pathologies in the rest. It should be emphasized that IDA -FOBT positivity, bleeding, and findings of other imaging modalities were related to tumor in colonoscopy.

Keywords: Colonoscopy, elderly, geriatric, colorectal carcinoma

INTRODUCTION

The share of the elderly population is increasing both in Turkiye and in the world.[1] There is an increase in the number of chronic diseases, malignancies, multiple drug or anticoagulant-antiaggregant use, constipation and other geriatric syndromes with aging.[2] The need for colonoscopy may arise due to aging, side effects of drugs used, or physiological or pathological changes in the gastrointestinal (GI) system associated with diseases occurring in the older population.[3] On the other hand, colonoscopy also has a very important place in the early diagnosis of colorectal carcinoma.[4]

Among the indications for colonoscopy, colorectal carcinoma screening, clinical signs and symptoms ranging from constipation to bleeding, and some laboratory findings such as iron deficiency anemia (IDA), fecal occult blood test. (FOBT) positivity can be listed.[5] Other causes of colonoscopy include endoluminal therapeutic approaches to pathologies like stenosis or angiodysplasia. Advanced age poses a risk for colorectal carcinoma, such that only 10% of diagnosed patients are younger than 50 years of age, and the diagnosis of tumors in the older population is 3 times higher than in the 50-64 age group.[6] Therefore, physicians via colonoscopy also aim to investigate whether there is underlying colorectal carcinoma in older patients.

Although colonoscopy is a frequently used diagnostic/therapeutic procedure, to the best of our knowledge, there are no studies that comprehensively evaluate the indications and findings of colonoscopy in older adults. In this study, we aimed to reveal the indications and findings of colonoscopy in older adults and to assess their associations.

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METHODS

The study was carried out with the permission of İstanbul University- Cerrahpaşa Clinical Researches Ethics Committee (Date: 06.07.2023, Decision No: 727524). All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki.

Study Group

In this study, we evaluated colonoscopy procedures performed in older adults (≥65 years) at a tertiary referral center's gastroenterology clinic. The endoscopy registry, which covered a 5-year period (2017-2022), was analyzed retrospectively. Both inpatient and outpatient groups were included in the study. Patients whose demographic data, colonoscopy indications, or findings could not be accessed were excluded from the study. Adults aged more than 75 years were evaluated as a subgroup (very old adults). Various studies have defined old (60-65) and very old (75-80-85) differently. The life expectancy at birth in Turkey is reported as 77 years at latest reports, and we defined very old adults as aged more than 75 years as Au AM et al.[7,8]

Data

Indications and findings of colonoscopies were evaluated in groups. In patients who underwent multiple colonoscopies with the same indication, the first procedure was included into study as a single procedure, other colonoscopies were excluded. The relationship between the indications and the associated findings was also evaluated. The analysis was performed on an indication basis by comparing the findings of colonoscopies performed with the selected indication to the findings of colonoscopies without that particular indication.

Statistical Analysis

Distribution analyzes of continuous data were assessed with the Kolmogorov-Smirnov test. Data with parametric, non-parametric, and categorical characteristics were expressed as mean ± standard deviation (SD), median (interquartile range (IQR)), and frequency, respectively. The Mann-Whitney U test was used to compare non-parametric data. The Chi-square test was used to evaluate the relationship between categorical data. A p-value < 0.05 was accepted as the limit for statistical significance. Statistical analysis was performed using SPSS 29.0 (IBM Corp., Armonk, NY, USA).

RESULTS

The data of a total of 2370 old patients were evaluated. 27.8% of the patients were in the very old group (n: 659; age >= 75). Nearly half (48.3%) of the patients were male, and the median age was calculated as 70 (IQR: 8) for whole group, as 78 (IQR: 5, max: 97) for very old group. The frequency of female gender was higher in the very old group (55.2%-50.3% p:0.031).

While colonoscopy was completed in 84.3% of the procedures, the cecum could not be reached in 15.7%. Colon cleansing was not optimal in approximately one-fourth (25.2%) of the procedures. Inadequate cleaning was reported in 79% of patients in incomplete colonoscopies; Other causes of subtotal procedure were technical reasons, presence of a mass lesion or luminal stenosis, and bleeding. There were no differences in the very old group in terms of the frequency of completed colonoscopies and optimal cleaning (p:0.195; p:0.382).

Colonoscopy indications are summarized in **Table 1**. Iron deficiency anemia (IDA) or fecal occult blood test (FOBT) positivity are the most common indications, while screening colonoscopy was the second most common one.

Table 1. Colonoscopy indications in older population

IDA-Positive FOBT	36%	Findings of other imaging modalities	3.9%
Screening	17.4%	Chronic diarrhea	3.2%
Previous colon polyp	9.8%	Constipation	3%
Bleeding	8.2%	Malignancy (?) workup	1.2%
Previous colon tumor	7.2%	Other	2.9%
UC-CD control	7.1%		

IDA: Iron deficiency anemia; FOBT: Fecal occult blood test; UC: Ulcerative colitis; CD: Chron's disease

The very old group was further evaluated in terms of the indications. IDA-FOBT positivity was significantly more frequent in the very old group (40.1%- 34.4% p:0.010). Bleeding was also a more common indication for the very old group (11.8%-6.8% p:0:01). Screening colonoscopy, inflammatory bowel disease (UC-CD) and polyp control were seen less frequently in the very old among indications (14.7-18.5%, p:0.031; 4.6-8.1%, p:0.003; 7-10.9%, p: 0.042). Constipation, control of a previous colon tumor, chronic diarrhea, colonoscopy due to other imaging findings and malignancy workup indications were found to have similar frequencies in the very old group. When the indications were evaluated in terms of their differences between the sexes, chronic diarrhea and IDA-FOBT positivity were significantly more common in women (p:0.009, p:0.001); control of a previous colon tumor or polyp were more common in men (p:0.007, p<0.001). There were 68 patients aged ≥85 years old, IDA or FOBT positivity (n:26, 39.7%) and bleeding (n:16, 23.5%) were the main indications of colonoscopy in these patients. Screening colonoscopy was performed on 5 (%7.4) patients of this age group. The oldest patient had bleeding as an indication of colonoscopy.

Procedures performed with the indication of inflammatory bowel disease (IBD) or chronic diarrhea had a higher completion rate (p:0.003, p:0.046), while colonoscopies performed for hemorrhage and due to other imaging findings had a lower rate (p<0.001, p:0.005). Again, the frequency of insufficient cleaning was lower in the colonoscopies performed with the indication of IBD and control of polyp (p<0.001, p:0.041).

Table 2 shows the colonoscopy findings in older patients. Colonoscopy was reported as normal in 42.4% of the patients, while polyps (28.3%) and diverticula (17.5%) were the most common findings. When the findings were compared in terms of gender, the frequency of normal colonoscopy was found to be higher in females (p<0.001). Polyps (33.9-23% p<0.001), ulcerative colitis (3.7-2.1% p:0.024) and angiodysplasia were significantly more common in males (4.5-2.5% p:0.008). Although the tumor frequency was numerically higher in older male patients, the difference was not statistically significant (4.8-4.2% p:0.451). When the very old group was further evaluated in terms of colonoscopy findings, the frequency of normal colonoscopy and Crohn's disease were found to be significantly less (37.3-44.3% p:0.002; 1.1-2.5% p:0.028). The frequency of polyps did not differ in the very old group (26.4 -29%, p:0.21). Tumors, diverticula and solitary rectal ulcers were seen more frequently in the very old group (6.8-3.6%, p<0.001; 26.4-14%, p<0.001; 1.1-0.3, p:0.025 respectively). Patients aged ≥ 85 had normal colonoscopy in 26%, had polyps in 26%, diverticula in %33.8 and tumor in 14.7% (n:10). Screening colonoscopies of these were reported as normal for 2 patients, to have diverticula for 2 patients and 1 patient was diagnosed with tumor.

Table 2. Colonoscopy findings of older population

Normal	42.4%	Ulcerative colitis	2.9%
Polyp(s)	28.3%	Crohn's disease	2.1%
Diverticula	17.5%	Other inflammatory pathology	1.2%
Tumor	4.5%	Solitary rectal ulcer	0.6%
Angiodysplasia	3.5%	Ischemic colitis	0.4%
Pseudo polyp	0.9%	Other	1.9%

The relationship in-between the indications and the findings were also assessed (Figure). IDA-FOBT positivity were found to be associated with tumor and angiodysplasia (p:0.043, p:0.039 respectively). For screening indication, the frequency of normal colonoscopy was significantly higher (53% p<0.001).

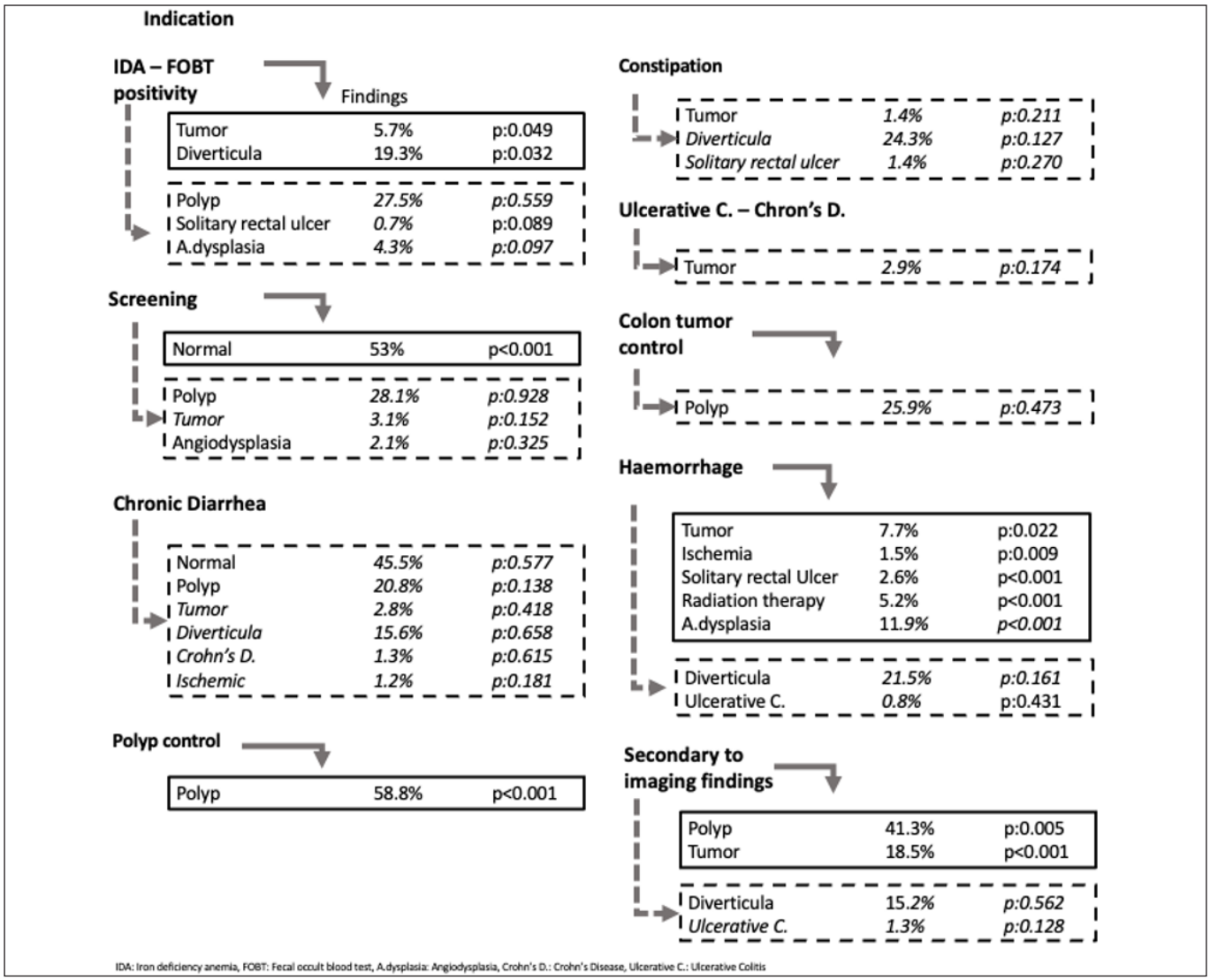

Figure. Relation between selected indications and findings.
Dotted lines enclose statistically insignificant relations, continuous lines enclose statistically significant relations, percentages refer to the frequency of given finding in the relevant indication.

Although diverticula frequency was found numerically higher in colonoscopies performed for constipation, the difference was not significant (24.3-17.3 p:0.127). While the frequencies of UC (p:0.125) or CD (0.624) were not significantly different in colonoscopies performed for chronic diarrhea, other inflammatory pathologies were found significantly frequent (7.8-1% p<0.001). Colonoscopies performed for signs of GI hemorrhage showed higher frequencies of tumor (7.7-42%, p:0.022), ischemic colitis (1.3-0.1% p:0.009), solitary rectal ulcer (2.6-0.3% p:0.002), radiation colitis (5.2 -0.4%, p<0.001) and angiodysplasia (11.9-2.8%, p<0.001). The frequency of polyp detection in the control colonoscopy of a patient with history of polyps was significantly higher (58.8-4.9 %, p<0.001), but there was no difference in terms of detecting tumor (3-4.6% p:0.254). The frequency of normal colonoscopy decreased when performed due to findings in different imaging methods (30.4%, p:0.018), while the frequency of polyps (41.3-27.7, p:0.005) and tumors (18.5-3.9%, p<0.001) increased significantly in these.

DISCUSSION

In our study, we evaluated colonoscopies performed in the older patient group in a tertiary referral center. It can be expected that the prolongation in expected life, and the increase in access to health services will cause an increase in the number of colonoscopies in the older population. Our study is valuable in terms of evaluating colonoscopy indications and findings holistically in a very high number of old patients. This is the first study, to our knowledge, that comprehensively review the indications and findings of colonoscopy in older patients.

In our patient group, colonoscopy was completed in approximately 85% of the patients. Although the rate of completion of colonoscopy varies according to the selected patient population and technical approaches in the literature, it is reported as 60-99%.[9] Being older (>80) was reported to be associated with lower completion rate10, we could not show this difference in the very old group in our study. This may be due to the fact that all procedures were performed under sedation, or it may be related to center related factors.[11] In addition to luminal causes such as mass lesions and luminal stenosis, insufficient cleaning was the leading cause of incomplete colonoscopy, which is parallel to the literature.[9,12] However, the very old group did not differ in terms of insufficient cleansing frequency. The high rate of achieving complete colonoscopy in the indications of IBD and chronic diarrhea may be due to the goal of evaluating the terminal ileum in this patient group. This suggests that in the older population, endoscopists do not force total colonoscopy in some patients considering indications. On the other hand, the higher rate of adequate cleansing in polyp control and IBD indications may be due to the repetitive colonoscopies in the history of these patients, that increased the compliance of them to bowel cleansing procedure. This probably also influenced the completion rate of colonoscopies in the indication of IBD.

Colonoscopy indications may differ in several studies depending on the study center and patient population characteristics.[13-15] In our study, the main three indications were IDA-FOBT positivity, screening colonoscopy, previous polyp-tumor history. These indications cover approximately 70% of our study group. The fact that our study was performed in a tertiary referral center probably increases the number of colonoscopies performed due to IBD or findings of different imaging studies. On the other hand, there may be relatively fewer patients who were scheduled for colonoscopy due to bleeding, for the same reason. In parallel with the increase in the frequency of additional pathologies in the very old patient group, the rate of screening colonoscopy was lower as expected. Despite screening is not recommended at the age of 85 and afterwards, there were few patients in our study that colonoscopy was performed with this indication. Unfortunately, we do not have any data regarding frailty status and performances of these patients, but it could be commented that physicians and endoscopists seems to take into account this indication if the patient is fit enough even aged ≥85 years old. The frequency of chronic diarrhea in the general population is reported to be 3-7%,[16] and although it is reported to be more common in the older patient group, it is also reported that seeking medical attention is also proportionally less.[17] It is seen as a colonoscopy indication at a similar rate in our study, in addition, this indication was found to be significantly more common in female gender, which is also supported by the literature.[18] On the other hand, considering that colon tumor is seen more in younger age males, it can be stated that the tumor and polyp control indication would be more frequent in this gender as in our study.[19]

In our study, it was observed that some kind of pathology was revealed in colonoscopy in one of two patients. The two most common pathologies were polyps and diverticula. The higher frequency of normal colonoscopy in women in the older population may be due to the predominance of relatively common pathologies such as polyps in men. Also, indications like chronic diarrhea of which majority had normal colonoscopy, and probably is related to functional diarrhea, was more frequent in older women. The tumor incidence was 4.5% in the whole group, and it was found to be significantly higher in the very old patient group. While the frequency of normal colonoscopy decreased in the very old group, pathologies such as diverticula and solitary rectal ulcer increased

in addition to the frequency of tumor. Especially the second pathology is related to the weakening of the supporting tissue in the ano-rectal region with age, and the deterioration of the synergy in defecation.[20,21]

When the relationship between indications and findings was evaluated, it was seen that IDA-FOBT positivity, GI bleeding and colonoscopy performed due to findings in different imaging modalities were associated with tumor. Other pathologies related to the indication of GI bleeding can be listed as angiodysplasia, solitary rectal ulcer and ischemic colitis. All three pathologies have the potential to be seen more frequently in the older age group and have been reported as a cause of bleeding.[22] Also post radiation therapy mucosal changes like telangiectasias-mucosal frailty is an important finding of colonoscopies performed due to hemorrhage in older patients as cumulative incidence of this increases with age. The higher frequency of finding recurrent polyps-in more than one of two procedures-suggests that surveillance colonoscopy is important in older adults. Not knowing the details of findings of the prior colonoscopy and the interval between procedures prevents us to interpret if this is due to skipped lesions or novel polyps. However, this sometimes is the case in the clinical setting and the higher frequency should be kept in mind in geriatric practice. In addition to detection of tumor, polyps and diverticula were the other common findings in colonoscopy performed due to imaging findings. Especially positron emission tomography combined cross-sectional studies can reveal colon polyps and even have the potential to differentiate the malign ones.[23] It can be assumed that this will lead to more frequent detection of these pathologies in older adults by colonoscopy, especially with the increased use of various imaging modalities.[24]

Study Limitations

Our study has some limitations. These can be listed as the retrospective design, not including pathology findings, and data from a single tertiary referral center. In addition, not knowing the comorbidities, medications, frailty and functionality of the patients prevented us from evaluating the relationship of our findings with such geriatric syndromes. However, we think that our study contributes to the literature as evaluating the indications and findings of colonoscopy holistically in a very high number of patients in the older population, and to our knowledge this is the first comprehensive study in this manner.

CONCLUSION

Eighty-five percent of colonoscopies can be completed in the older patient group, and both this rate and the frequency of insufficient cleansing seem to be similar in the very old patient group. The main indications for colonoscopy it the older population can be listed as IDA-FOBT positivity, screening colonoscopy and control of previous polyp-tumor. In these patients, near one of two colonoscopies was found to be normal, while polyps and diverticula were the major pathologies. It should be emphasized that among the indications related to tumor detection, besides IDA -FOBT positivity and gastrointestinal bleeding, colonoscopies performed due to findings of other imaging modalities can be listed.

ETHICAL DECLARATIONS

Ethics Committee Approval: The study was carried out with the permission of İstanbul University-Cerrahpaşa Clinical Researches Ethics Committee (Date: 06.07.2023, Decision No: 727524).

Informed Consent: Because the study was designed retrospectively, no written informed consent form was obtained from patients.

Referee Evaluation Process: Externally peer reviewed.

Conflict of Interest Statement: The authors have no conflicts of interest to declare.

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