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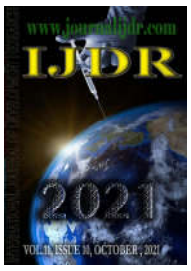

RESEARCH ARTICLE OPEN ACCESS

EPIDEMIOLOGICAL ANALYSIS AND RESULTS FROM COLONOSCOPIES IN PATIENTS FROM 84 MUNICIPALITIES BETWEEN 2015 AND 2019

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ABSTRACT

Theaim of this study was to trace and describe the epidemiological profile of patientsundergoing colonoscopy through an observational cross-sectional cohort study whichfocused on patients from a macro region comprised of 84 municipalities in the inland of the state of São Paulo from 2015 to 2019. Results from 610 patients undergoing colonoscopy at the Regional Hospital of Jundiaíwere used to develop a comparative analysis betweenexam requests and main endoscopic findings, including prevalent colorectal pathologies. The patients underwent examination following the same hospitalization protocol for colon preparation, non-operating room anesthesia and propofol sedation, all performed by the same doctor. Out of a total of 610 medical records studied, 63.9% were female and 36.1% male. Exam requests were primarily based on bowel habit alterations, 17.4%. Only 61% of the exam requisitions proved to be adequate, 96.2% presented good colonic preparation, 56.2% showed alterations, and 26.1% were diagnosed with colonic diverticular disease. Considering the risks and complications of colonoscopy, indicationsforthis exam should be properly defined and guided according to clinical signs and risk factors. In addition, the most common pathology detected by the colonoscopy exams was the colonic diverticular disease, as extensively described in the literature.

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INTRODUCTION

Colonoscopy is a method of investigation of colorectal diseases which allows the direct observation of the colonic mucosa and, often, of the terminal ileum, thus providing specific[1]diagnostic evidence. It is an examwhich demands standard procedures for preparation, sedation and analgesia[2]. Similarly to any other invasive procedures, colonoscopy may present serious complications during its performance or preparation, such ashydroelectrolyte disorders, colonic perforations, bleeding, obstructive lesions, constrictions and adherences, among others. Considering the risks and complications, the indication for colonoscopy should be properly defined and guided by clinical signs and risk factors[3]. Although the conditions for colonoscopy performance have already been established, it is very often performed in patient regardless of a proper indication for the exam. A study carried out in a medical clinic (in São Paulo, Brazil)showed that over 20% ofthe indications for colonoscopydo not meet the pre-established requirements for the exam, as established by the guidelinesof the American Gastroenterological Association, such as the presence of nodules (in lung and liver), consumptive syndrome, high CEA levels, among others[13].

Therefore, the aim of this study is to trace and delineate the epidemiological profile of patients undergoing colonoscopy in a macro-region of 84 municipalities in the interior of São Paulo between 2015 and 2019, comparing the indication of exams with its main endoscopic findings and the most prevalent colorectal pathologies.

MATERIAL AND METHODS

This is an analytical observational retrospective cross-sectional cohort. Data from 610 patients, who underwent colonoscopy exams at the Hospital regional de Jundiaí, São Paulo state, Brazil, were collected and analyzed. Exams were indicated and requested by local physicians and fowarded to be performed at the hospital. Patients were admitted to the hospital the day before the exam for appropriate colon preparation and standardization of the technique. Laxatives, such as polyethylene glycol (PEG) and sodium phosphate (NaP), were used to clean the intestine and reduce gas to facilitate visualization during the examination. At the time of the exam, patients were first sedated with propofol associated with midazolam

and fentanyl, and then the exams were carried out in a dedicated room with the presence of a nurse and a technician for drug administration and patient monitoring. The same surgeon performed the exams to avoid differences in techniques among physicians. Patients not included in the research were those who did not have the minimum necessary data in their medical records. The variables studied in the results obtained from the exams were: gender, age, diagnoses, indications and preparation for the exam. For the data processingand analysis the Excel software and theSPSS version 13 were used, respectively. Afterward, both the descriptive of variables and the bivariate analyses were then performed. The research was conducted within ethical standards and approved by the Hospital Ethics Committee.

RESULTS

Of all the 610 medical records studied, 63.9% (n=390) were female and 36.1% (n=220) were male. Ages ranged from 21 to 90 years with a mean of 59 years, median of 61 years and mode of 62 years (Table I). The main indication for colonoscopy was based on changes in bowel habits occurring in 17.4% (n=106 exams), followed by abdominal pain in 14.4% (n=88 exams), and post-polypectomy follow-up in 14.4% (n=88) of the indications (Table II).

Table I. Patients percentage by sex

Variable	#	%
Female	390	63.90
Male	220	36.10

Table II. Indications for colonoscopy

Indications	#	%
Bowel habit change	106	17.40
Abdominal pain	88	14.40
Follow-up after polypectomy	88	14.40
Low Digestive Bleeding	81	14.10
Fecal occult blood	41	6.70
Postoperative	41	6.70
Diverticular Desease Follow-up	28	4.60
Hemorrhoid	18	3.0
Family History	17	2.80
Anemia	16	2.60
Rectal Pain	9	1.50
Touchable lesion in rectum	9	1.50

The indications were evaluated and grouped as either adequate or inappropriate, with only 61.6% (n=376 exams) considered as adequate. Out of the 610 exams evaluated, 96.2% (n=587 exams) presented proper colon preparation and 3.8% (n=23 exams) poor quality preparation. Out of all the results, 43.8% (n=267 exams) did not present alterations, and among those showing alterations, 26.1% (n=159) were diagnosed with colonic diverticular disease, 12.5% (n=76) with hemorrhoidal disease, 11% (n=67) with polyps, 4.8% (n=29) with neoplasia, 1.3% (n=8) with retitis, and 1.1% (n=7) with rectal neoplasm (Table III).

Table III. Colonoscopic Diagnoses

Diagnoses	#	%
Normal	267	43.80
Diverticular Desease	159	26.10
Hemorrhoid Desease	76	12.50
Polyps	67	11.00
Colon Neoplasm	29	4.80
Retitis	8	1.30
Rectal Neoplasm	7	1.10

Among patients with colonic diverticular disease, 26.7% were female and 26.9% male, and no substantial differences were observed. As for the age range, 31.4% of patients were older than/equal to 50 years old, according to Yattes p<0.001, which is highly significant. Concerning the hemorrhoidal disease,13.6% were female and 11.3% were male, the difference was not relevant either. As far asthe age range goes, 11.7% of patients were under 50 years old, according to Yattest test p=0.767, which is not a relevant result. Regarding colon neoplasm, 7.5% of the patients were male and 3.4% female, according to Yattes test with p<0.041, which is significant. In terms of age group, 5.4% of the patients were older than/equal to 50 years and 3.6% were younger than 50 years, based on the Yattes test, p=0.542, which was not significant. Regarding rectal neoplasm, 1.4% were male and 1% female, according to Fisher's exact test, p=0.704, which was not significant. As for the age group, 1.6% were older than 50 years old and 0% were younger than 50 years old, according to Fisher's exact test, p=0.207, which was not significant. Of the patients presenting some diagnosis from the exams, 58.5% were male and 53.1% female, according to Fisher's test p=0.242, which is not significant. According to age group, 59.7% were older than/equal to 50 years and 39.4% were younger than 50 years, according to Fisher's test p<0.001, which is highly significant (Table IV).

Table IV. Percentage of patients with several diagnoses according to sex

Diagnosis	Female (%)	Male (%)	p
Diverticular desease	26.70	26.90	>0.999*
Hemorrhoid desease	13.60	11.30	0.501*
Colon neoplasm	3.40	7.50	0.041*
Rectal neoplasm	1.0	1.40	0.704#
Some diagnosis	53.10	58.10	0.242#

*Yates's chi-squared test; # Fisher´s exact test

DISCUSSION

Colonoscopy is currently considered the gold standard test in the study of the colonic mucosa and terminal ileum. In addition to providing a diagnostic proposal, it allows the performance of therapeutic procedures. As for the epidemiological profile of patients undergoing colonoscopy at the Regional Hospital of Jundiaí, from January 2015 to October/2019, higher prevalence in females 63.9% (no. 390) as compared to males 36.1% (No. 220) was identified.This may have occurred due to the greater demand for medical assistance by female patients, aging from 21 to 90 years, with an average of 59 years old, median of 48 years old and mode of 62 years old. These results are similar to those presented by Oliveira et al[5], however differentiating from studies of Freitas et al[6], which showed a population of 54.2% under 50 years old. For a proper colonoscopic examination, the colon must be properly cleaned[2] by following the preparation techniques, which have been improved over time as a result of more effective laxatives, such as polyethylene glycol (PEG), sodium phosphate (NaP) and enemas[7,8,9,10]. The purpose of those procedures is to obtain a good visualization of the mucosa and to reduce potentially explosive gases, such as hydrogen and methane[9,10].

Sedation and analgesia should be utilized in colonoscopy. Propofol is the agent of choice which allows a proper performance of mesentery traction maneuvers and colic lumen, in addition to having an amnesia effect with a short half-life, however with limited analgesic action[11, 12]. The American Society of Gastrointestinal Endoscopy recommends a pre-procedural protocol for safer colonoscopy performance[5],which includes: pregnancy testing for women of childbearing age with an uncertain pregnancy history; blood count and coagulation examination for patients with active intestinal bleeding; Chest X-ray for patients presenting respiratory or heart failure symptoms. In the same way as any invasive procedure, colonoscopy can present serious complications during preparation and examination. However, according to a Canadian study published in 2012, complications correspond to only 0.05% of the cases[13,14] and the overall risk of adverse events after the exam is low, although increasing with age, especially in people over 75 years of age. As previously mentioned, in a study carried out between 2001 and 2005in the USA, people aged 80 to 84 years are 75% more likely to have serious gastrointestinal adverse events compared to people aged 66 to 69 years[15,16]. Bleeding is the most common complication (0.87-2.7%), which is associated with therapeutic methods, especially the resection of large lesions[17].

Perforation is very rare, occurring in 0.016% of diagnostic procedures and in 0.5 to 3% of therapeutic procedures. It occurs mainly in the sigmoid colon, a region with the highest incidence of diverticular disease, making the wall at this location thinner and more fragile in cases of previous inflammatory processes. By and large, it is a safe procedure, since complication rates are low and, when they occur, if measures are taken in a timely manner, there is little or no prolonged clinical repercussion on the patient. Considering the risks and complications, the indication for this exam must be well defined and oriented by clinical signs and risk factors[17]. To this purpose, the American Gastroenterological Association was a pioneer, in 1977, of a set of guidelines forcolonoscopy indications.

Those guidelines have been improved over time resulting in the current indications for the exam, as follows:

1. Investigation of colon neoplasia if risk and clinic factors are identified.
2. Low intestinal bleeding, recent or active hematochezia, positive occult blood in stools, unexplained iron deficiency or even sign of melenaafter upper digestive endoscopy rules out the cause in upper digestive tract.
3. Chronic diarrhea for investigation of inflammatory bowel disease. In cases of constipation, colonoscopy is recommended in face of chronic blood loss orweight loss. In case of chronic abdominal pain, the indication is only adequate in the presence of risk factors and suggestive clinic.
4. Alterations identified in imaging exams (enema, computed tomography of abdomen, positron emission tomography, magnetic resonance imaging).
5. Patients with metastatic adenocarcinoma disease of unknown origin, presenting polyps on radiographic images.
6. Search for synchronous or metachronous lesion in patient with colon neoplasia.
7. Postoperative follow-up of patients undergoing colon cancersurgery.
8. Intraoperative location of injury, bleeding point and small clots.
9. For the study and follow-up of chronic inflammatory diseases.
10. Endoscopic therapy which includes polypectomies, bleeding lesions, dilations of stenosis and in diathermic sternotomy.

Regarding the main indications for colonoscopy detected by this study, the main indication was based on changes in bowel habits, 17.4% (n=106 tests), followed by abdominal pain, 14.4% (n=88), which are very similar to those described in Creuz et al.[18]. In the present study, the indication for the exam associated with clinical condition and diagnose was also evaluated and characterized as either adequate or inadequate. Results showed that 61.6% of the indications for the exams were adequate. As for the diagnoses obtained, 43.8% (n=267) werenormal, 26.1% (n=159) were diagnosed with colonic diverticular disease, 12.5% (n=76) with hemorrhoidal disease and 11% (n=67) with polyps. These results differ from those in the literature, which describes that polyps as main diagnostic finding, followed by colonic diverticular disease, neoplasm and inflammatory bowel disease. Those discrepancies are probably due to the indications for those exams. The diveticular disease is one of the pathologies mostly found in colonoscopy exams. Its incidence increases with age and it is usually located at the sigmoid level. The pathogenesis is multifactorial, and factors such as low fiber intake, intestinal dysmotility, microbiota and changes in connective tissues are associated to its evolution[18]. Hemorrhoid disease is the most common anorectal disease. Its real prevalence is not known, however, it is known to be increasing over the years. Clinical history and physical examination, including digital rectal examination and anoscopy, are mandatory for an accurate hemorrhoidal disease diagnose.

Colonoscopy examination is not part of the diagnosis of hemorrhoidal disease, but for any patient with rectal bleeding, it is highly recommended that either rectosigmoidoscopy or colonoscopy[16]is performed. The incidence and mortality of colorectal cancer has declined over the decade in the USA, due to the well established colorectal cancer screening protocols. Despite the decrease, colorectal cancer is still the third most incident and fatal cancer[19]. It is worth noting that the data obtained in this study is similar to other studies in the literature, with regard to the epidemiological profile, the indications for the examination and the diagnoses sought.

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