

# APPROPRIATENESS OF REFERRING FOR COLONOSCOPY: RESULTS FROM A CROSS-SECTIONAL STUDY IN PRIMARY CARE

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A – study design, B – data collection, C – statistical analysis, D – interpretation of data, E – manuscript preparation, F – literature review, G – sourcing of funding

## ABSTRACT

**Background:** Colorectal cancer (CRC) is the third most commonly diagnosed malignant cancer and the fourth leading cause of cancer-related death in the world. The role of family doctors in the diagnosis and management of gastrointestinal disorders, including screening for CRC, is crucial.

**Aim of the study:** To examine the appropriateness of colonoscopy referrals in a primary healthcare setting.

**Material and methods:** The clinical reports of all colonoscopies ordered during 2017 at a primary care center (317 in total) were examined. The reasons for referral, the findings of the colonoscopies, and the pathology of identified polyps were extracted from the reports and summarized.

**Results:** The patients included 161 males (50.8%) and 156 females (49.2%) with a mean age of 63.6 years. The most frequent reasons for ordering a colonoscopy were a personal history of polyposis/CRC (n=94, 29.7%), rectal bleeding (n=57, 18%) and anemia (n=35, 11%). Only 67 (21%) of the colonoscopies performed showed a normal result, whereas 250 (79%) had abnormal findings. The main findings of the colonoscopies were polyps (n=119, 37.5%), diverticulosis (n=61, 19.2%) and hemorrhoids (n=37, 11.7%). The main results for polyp pathology were tubular adenoma with low-grade dysplasia (n=70, 58.8%), hyperplastic polyp (n=27, 22.7%), adenocarcinoma (n=9, 7.6%) and inflammatory polyp (n=4, 3.4%). Colorectal cancer was found in a total of 14 (4.4%) patients.

**Conclusions:** The referral for colonoscopy by family doctors is appropriate.

**KEYWORDS:** colonic polyps, diverticulitis, endoscopy, gastrointestinal, early detection of cancer, colonic neoplasms, hemorrhage

## BACKGROUND

Colorectal cancer (CRC) is the third most commonly diagnosed malignant cancer and the fourth leading cause of cancer-related death worldwide. The incidence of CRC is expected to increase by 60% to more than 2.2 million new cases and 1.1 million deaths by 2030. [1]

Colonoscopy (CS) is an effective diagnostic tool for multiple gastrointestinal disorders, and is primarily used for the detection of CRC. In the last decade, the demand for endoscopic procedures has quadrupled in Spain, leading to significant increases in both healthcare expenditures and patient waiting times. [2] In recent years, the critical role of family doctors in the diagnosis and treatment of gastroin-

testinal disorders, including the detection of CRC, has been well recognized. Spanish guidelines involve family doctors in the population screening programs for early detection of CRC. [3] However, it has been reported that some family doctors disregard the CRC screening guidelines due to a shortage of time, patient preferences, and waiting lists. [4] In 2008, the European Panel on the Appropriateness of Gastrointestinal Endoscopy (EPAGE II) updated the criteria for several indications for CS. Although the updated EPAGE II criteria serve as an aid for clinical decision-making, the guidelines should not replace individual clinical judgment. [5]

Validations of the EPAGE II criteria have found them to be useful for enhancing the appropriateness of the indication and the diagnostic yield. [6] Other studies have assessed whether the EPAGE II criteria need further refinement to increase sensitivity and to avoid missing important bowel lesions. [7] A Sri Lankan study on the appropriateness of the indication for CS according to the EPAGE II criteria found that one in ten patients undergo inappropriate CS. [8]

The results of the screening programs in Spain have been assessed previously [9]. However, there are no studies on the appropriateness of the use of CSs indicated for any reason in primary health care.

## AIM OF THE STUDY

The goals of this study are to examine the indications for ordering a CS in a primary health care center, and to analyze the findings of the resulting CSs.

## MATERIAL AND METHODS

This descriptive cross-sectional study was carried out in an urban center in Barcelona with a listed population of 32,621 inhabitants. The study included all the CSs ordered for any reason in our health care center between the 1<sup>st</sup> of January and the 31<sup>st</sup> of December 2017. These cases included our listed population who had a positive result in a screening fecal occult blood test. The screening program is run by a specialized unit, which recruits all of the population between 50 and 70 years old. These individuals are tested with a fecal occult blood test every two years [10]. Those individuals with a positive result are referred to primary health care for a CS.

Reports from 328 CSs ordered in our health center and the pathology of the biopsies performed were analyzed. The results of the biopsies are sent to the family doctor via electronic clinical record and the data were obtained from the electronic clinical records program eCAP™. As the data were appropri-

ately anonymized by the Informatics Department of our company, the study did not require ethical committee approval. A total of 11 orders were excluded for the following reasons: 5 orders were excluded because they were never performed, 1 order had missing results, 3 CSs were repeated due to poor preparation of the patient, and 2 orders were mistakenly duplicated (only 1 CS was carried out). The quantitative variables analyzed were as follows: reasons for ordering a CS, findings of the CS, and pathology of the polyps. The variables were summarized using descriptive statistics, including frequencies and percentages.

Only one indication and one finding per CS were analyzed. When there was the concurrence of several indications, we chose the most relevant according to a consensus of the authors. In case of more than one finding, we prioritized the findings according to the severity in the following order: cancer, polyp, diverticulosis, hemorrhoids.

## RESULTS

A total of 317 patients (161 male and 156 female) with a mean age of 63.6 years (range from 21 to 94) were included in the study. The reasons for ordering a CS are shown in Table 1. The most frequent reasons were a personal history of polyposis / CRC (n=94, 29.7%), rectal bleeding (n=57, 18.0%) and anemia (n=35, 11.0%).

Table 1. Main reasons for ordering a colonoscopy

Reasons for ordering a colonoscopy	Frequency	Percent
Personal history of polyposis / CRC	94	29.65
Rectal bleeding	57	17.98
Anemia	35	11.04
Other	34	10.73
Abdominal pain	28	8.83
Family history of CRC	20	6.31
Diarrhea	15	4.73
Constipation	14	4.42
Intestinal rhythm disturbance	10	3.15
Personal history of CRC	5	1.58
Weight loss	5	1.58
Total	317	100.00

The findings from the CSs are shown in Table 2. The vast majority of the CSs performed showed an abnormal result (n=250, 78.9%), whereas 67 (21.1%) were normal. The main findings were polyps (n=119, 37.5%), diverticulosis (n=61, 19.2%) and hemorrhoids (n=37, 11.7%).

Table 2. Main results of the colonoscopy's findings

Colonoscopy's findings	Frequency	Percent
Polyp	119	37.54
Normal	67	21.14
Diverticulosis	61	19.24
Hemorrhoids	37	11.67
Poor preparation	11	3.47
Ulcerative colitis	10	3.15
CRC	5	1.58
Angiodysplasia of the colon	4	1.26
Other colitis	3	0.95
Total	317	100,00

The pathology results from the 119 polyps found are summarized in Table 3. The main results were tubular adenoma with low-grade dysplasia (n=70, 58.8%), hyperplastic polyp (n=27, 22.7%), adenocarcinoma (n=9, 7.6%) and inflammatory polyp (n=4, 3.4%).

Table 3. Main results of polyp's pathology

Polyp's pathology	Frequency	Percent
Tubular adenoma with low-grade dysplasia	70	58.82
Hyperplastic polyp	27	22.69
Adenocarcinoma	9	7.56
Inflammatory polyp	4	3.36
Sessile serrated adenoma without dysplasia	4	3.36
Tubular adenoma with high-grade dysplasia	3	2.52
Tubular adenoma without dysplasia	1	0.84
Tubulovillous adenoma with high-grade dysplasia	1	0.84
Total	119	100,00

In total (polyps and biopsy of colonic stenosis), 14 cases of CRC were found (4.4%).

## Discussion

A high proportion of abnormal findings were found in the CSs ordered by family doctors, which supports the appropriateness of its use in primary health care. With regard to CRC, malignant cancer was found in the early stages, where it could potentially be treated and cured.

The high proportion of abnormal CSs (79%) suggests that the referral behavior of family doctors in

primary health care is appropriate. Our results are in disagreement with a previous Spanish study that showed that only 23% of CSs requested in primary health care produced relevant findings. [11] A Swiss study also suggested that the underuse of CSs exceeds the overuse. [12] However, in line with the current results, other studies conclude that CSs requested by primary care physicians are adequate to recognized standards [13]. Other studies have reported that an inappropriate use of CS was due to a short lapse of time after a polypectomy [2,14]. In our study, we did not consider this variable. In another study, the indication for CS was considered inappropriate in patients younger than 50 when anorectal diseases were not ruled out previously, and when a patient with abdominal pain had no alarming symptoms. [15] Regarding the differences in use of CS by medical specialty according to the EPAGE II criteria, a study found no differences between gastroenterologists and the other specialists, including internal medicine doctors and family doctors. [16]

The referral for CS led, in the majority of cases, to abnormal findings, and a significant number (n=14, 4.4%) of referred patients were diagnosed with CRC. These findings support the results of an Italian study showing that there is an excess risk of CRC death among those not completing CS after a positive fecal occult blood test. [17] The use of a fecal immunochemical test after a CS to enhance the detection of CRC is still being assessed. [18] Patient preferences and attitudes should be considered when offering screening programs to prevent CRC. [19] The recent coronavirus pandemic has altered the existing screening programs for CRC [20] and other alternatives to CS have been considered [21]. However, we can still consider CS as the gold standard for the screening of CRC.

This study adds to current knowledge regarding to the appropriateness of the use of CS in primary health care. We found that the use of CSs in primary health care is appropriate. For this reason, we advocate for referral for CSs by family doctors worldwide in order to increase the early detection of potentially malignant bowel diseases. Further studies will continue to clarify the main uses of CSs in primary health care and their cost-effectiveness.

## Limitations

The limitations of this study include the inclusion of a relatively small number of patients at a single healthcare center. Unfortunately, in this study, we also could not identify the number of patients with CRC who were diagnosed outside of the primary health care setting (e.g., in the hospital, private medicine, etc.). In addition, we included in this study all CSs or-

dered, regardless of the underlying reason, which may have been assessed by either the family doctor's criteria or the screening program. We did not determine whether the family doctor's criteria were consistent the EPAGE II criteria or any other guidelines.

## CONCLUSIONS

The current findings show that the main reason for ordering a CS was a personal history of polyposis or CRC. The referral for CS led, in the majority of cases (79%), to abnormal findings, with the most

frequent finding being polyps (37.5%). Among the polyps discovered, the most frequent pathology was tubular adenoma with low-grade dysplasia (58.8%). Overall, CRC was diagnosed in 4.4% of total patients. Thus, these results provide evidence that the referral for CS by family doctors is appropriate.

## Acknowledgements

The authors sincerely thank Dr. Laura Ruiz Martínez and Prof. Thomas Frese (University of Halle) for their kind help.

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Word count: 10 070

• Tables: 3

• Figures: 0

• References: 22

**Sources of funding:**

The research was funded by the authors.

**Conflicts of interests:**

The authors report that there were no conflicts of interest.

**Cite this article as:**

Sánchez-Ruano N, Hervás A, Vilaseca J.

Appropriateness of referring for colonoscopy: results from a cross-sectional study in primary care.

*Med Sci Pulse* 2021; (15) 2: 3–7. DOI: 10.5604/01.3001.0014.8693.**Correspondence address:**

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Received: 24.11.2020

Reviewed: 23.04.2021

Accepted: 25.04.2021