



# Journal of Coloproctology

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## Original article

# Risks and benefits of colonoscopy in patients aged 80 and older: a prospective study

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## ARTICLE INFO

### Article history:

Received 14 April 2013

Accepted 22 May 2013

### Keywords:

Colonoscopy

Risks

Complications

Older age

Elderly

### Palavras-chave:

Colonoscopia

Riscos

Complicações

Idade avançada

Terceira idade

## ABSTRACT

**Objective:** this study aims to compare colonoscopy results in patients aged 50-79 and those aged 80 and older.

**Patients and Methods:** a total of 533 diagnostic colonoscopies performed from August 2011 to January 2012 were evaluated in a prospective study analyzing age, ASA classification, comorbidities, endoscopic findings, time to reach the cecum, number of complete examinations, difficulties and complications. Chi-square test was used to compare categorical data whereas Student's t test to compare means. A p value < 0.05 was considered significant.

**Results:** 479 patients were in Group A — age 50 to 79, whereas 54 were in Group B, 80 versus older. The following results are shown for Group A and B, respectively: age 63 ± 8 versus 84 ± 4 years. ASA 1 difficult examination: 58 (21 %) versus 12 (27%) p > 0.05, ASA > 2 difficult examination: 41 (20%) versus 6 (60%) p < 0.05. Comorbidities 255 (53%) versus 36 (66%) p > 0.05. Complete colonoscopy in 450 (94%) versus 45 (83%), p < 0.01. Difficulties in 99 (20%) versus 32 (40%), p < 0.01. Complications in 1 (0.2%) versus 3 (5%) p < 0.01. Diverticulitis/ sequelae in 3 (0.6%) versus 3 (5%) p < 0.01. CRC in 42 (8.7%) and 10 (18.5%), p < 0.05. Adenoma in 130 (27 %) versus 15 (27%), p > 0.05 Time to reach the cecum was 39 ± 10 minutes for difficult procedures and 13 ± 9 for the easy ones.

**Conclusion:** age 80 and older is associated with more adverse events during colonoscopy.

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## Riscos e benefícios da colonoscopia após os 80 anos de idade: trabalhos prospectivo

### RESUMO

**Objetivo:** avaliar riscos em colonoscopia após 80 anos de idade.

**Pacientes e métodos:** entre agosto de 2011 e janeiro de 2012 realizamos colonoscopias em 533 pacientes. Grupo A: idade entre 50 e 79 e Grupo B > de 80 anos. Parâmetros analisados: ASA, comorbidades, achados endoscópicos, tempo de chegada ao ceco, número de exames completos, dificuldade e complicações. Usamos teste Qui-quadrado para comparar proporção e teste t de Student para média e desvio padrão. p < 0,05 foi considerado significativo. Este é um estudo prospectivo.

**Resultados:** 533 pacientes sendo 479 do Grupo A e 54 do Grupo B. Resultados seguem a se-

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quência A e B. Idade  $63 \pm 8$  e  $84 \pm 4$ . ASA 1, exame difícil 58 (21%) e 12 (27%)  $p > 0,05$  > ASA 2 difícil 41 (20%) e 6 (60%)  $p < 0,05$ . Comorbidades 255 (53%) e 36 (66%)  $p > 0,05$ . Exame completo 450 (94%) e 45 (83%)  $p < 0,01$  Difícil 99 (20%) e 32 (40%)  $p < 0,01$  Complicações 1 (0,2%) e 3 (5%)  $p < 0,01$  Normal 149 (31%) e 5 (9%)  $p < 0,01$  Diverticulite/sequela 3 (0,6%) e 3 (5%)  $p < 0,01$ . CCR 42 (8,7%) e 10 (18,7%)  $p < 0,05$ . Adenoma 130 (27%) e 15 (27%)  $p > 0,05$ . Tempo em minutos  $39 \pm 10$  para os difíceis e  $13 \pm 9$  para os fáceis.

**Conclusão:** a idade de 80 anos constitui um risco para a realização de colonoscopia.

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## Introduction

Colorectal cancer (CRC) is a frequent disease and has been increasingly diagnosed in recent years. Colonoscopy is considered the gold standard for its screening, allowing diagnosis and removal of premalignant lesions such as adenomas, as well as the endoscopic treatment of adenocarcinomas in their early non-invasive phase and detection of advanced CRC.

The American College of Physicians (ACP) recommends as routine, in the average-risk population, that screening for CRC should start at age 50 for Caucasians and 45 for African descendants and that it should be discontinued in those older than 75 years or when an adult's life expectancy does not exceed 10 years.<sup>1</sup>

The incidence of benign and malignant diseases of the digestive tract increases with age.<sup>2</sup> The decision to perform screening and surveillance by colonoscopy in the elderly must be assessed against the risks and benefits of this procedure at this age range.<sup>3</sup> The purpose of our study is to assess the difficulties, risks and benefits of performing colonoscopy in the elderly, specifically those older than 80 years.

## Patients and methods

The present was a prospective study that compared parameters such as age, sex, American Society of Anesthesiologists (ASA) classification, comorbidities, endoscopic findings, time to reach the cecum, number of complete examinations, difficulties and complications in colonoscopies performed under mild intravenous sedation with midazolam and meperidine in two groups, distributed by age range: 50-79 years old, group A and older than 80, group B. Patients previously submitted to surgery for colon cancer were excluded. A total of 533 patients that underwent colonoscopy from August 2011 to January 2012 were eligible for the study. Chi-square test was used to compare absolute numbers and Student's t test was used for the study of means and standard deviation. A p value  $< 0.05$  was considered significant. All patients signed the informed consent to undergo the examination. The tests were performed at the Department of Coloproctology of Hospital Federal dos Servidores do Estado do Rio de Janeiro (HFSE) of the Ministry of Health and the Digestive Endoscopy Service at Casa de Portugal, Rio de Janeiro, by the study author.

## Results

A total of 533 patients were submitted to colonoscopy according to the protocol described in Patients and Methods. The number of patients divided by age can be seen in Table 1, whereas age range for each group is shown in Table 2.

The results obtained when the two groups were compared are shown in Table 3.

## Discussion

Our results, as shown in Table 3, clearly demonstrate that, in patients aged 80 and older, there was a higher incidence of difficulties, complications and diseases diagnosed by

**Table 1 – Distribution by age range.**

	Group A 50 to 79 years	Group B 80 years and older
Number of patients	479	54

**Table 2 – Age range.**

	Group A	Group B
Age (years)	$63 \pm 8$	$84 \pm 4$

**Table 3 – Comparison between group A and group B.**

	Group A		Group B		p
	n	%	n	%	
ASA I (difficult)	58	21	12	27	$> 0.05$
ASA > II (difficult)	41	20	6	60	$< 0.01$
Comorbidities	255	53	36	66	$> 0.05$
Completed examinations	450	94	45	83	$< 0.01$
Difficulties <sup>a</sup>	99	20	32	40	$< 0.01$
Complications	1	0.2	3	5	$< 0.01$
Normal	149	31	5	9	$< 0.01$
Diverticulosis	104	21	22	40	$< 0.01$
Diverticulitis sequelae	3	0.6	3	5	$< 0.01$
CRC	42	8.7	10	18.5	$< 0.05$
Adenoma	130	27	15	27	$> 0.05$

<sup>a</sup>The time required to reach the cecum was  $39 \pm 10$  minutes for difficult examinations and  $13 \pm 9$  for the easy ones.

colonoscopy, a result similar to that described in a meta-analysis published in 2011.<sup>4</sup>

The ASA classified the risk of surgical procedures into six groups, depending on the patient's physical status. This classification is shown in Table 4.

The risks and difficulties for surgical and/or invasive procedures can therefore be predicted using the ASA Classification.<sup>5</sup> In our results, there was no difference regarding the difficulty to perform the examinations in both Groups A and B in patients classified as ASA-I,  $p > 0.05$ , who were all healthy individuals, without comorbidities.

However, for those with ASA classification greater than II, patients with diseases, generically called comorbidities, this difference was significant with  $p < 0.01$ , resulting in greater difficulty in colonoscopies performed in Group B, as shown in Table 3.

An apparent inconsistency occurred when comorbidities were analyzed, as there was no difference when comparing Group A with Group B,  $p > 0.05$ . This fact may be explained because the incidence of disease was the same in both groups; however, Group B had more severe disease and therefore higher ASA classification. In our study, ASA classifications higher than II were analyzed together, as described in Patients and Methods and in endoscopic evaluations, higher ASA classification implies in higher risk.<sup>6</sup>

Comorbidities found in both Group A and B are listed alphabetically in the following paragraph: anemia, post-surgical and/or radiation adhesions, Alzheimer, abdominal aortic aneurysm, cardiac arrhythmia, with or without pacemaker, peripheral artery disease, rheumatoid arthritis, asthma, ischemic stroke, chronic bronchopathy, cervical cancer with radiotherapy, same for prostate cancer, chronic coronary disease with coronary artery bypass grafting (CABG) or not, compensated or decompensated liver cirrhosis with ascites, kidney stones, diabetes mellitus, chronic neurological disease, chronic obstructive pulmonary disease (COPD), gastroesophageal reflux disease (GERD) with or without Barrett's esophagus, compensated psychiatric illness, endometriosis, compensated epilepsy, femoral neck fracture, upper and lower gastrointestinal bleeding, arterial hypertension, chronic renal failure with Tenckhoff catheter for peritoneal dialysis or arteriovenous fistula for hemodialysis, lymphoma, retroperitoneal mass, myelodysplasia, diverticulitis sequelae, metabolic syndrome with obesity and ovarian tumor.

**Table 4 – ASA classification.**

ASA 1:	No disease
ASA 2:	Mild systemic disease such as diabetes, controlled hypertension and obesity
ASA 3:	Severe systemic disease, such as angina pectoris, chronic obstructive pulmonary disease and history of myocardial infarction
ASA 4:	Disabling, life-threatening illness, such as congestive heart failure and renal failure
ASA 5:	Dying patient with chance of survival of less than 24 h
ASA 6:	Brain death
Add "E" when it is an emergency.	

As for the diagnosis, we observed that in our study, the incidence of CRC increased significantly with age, whereas the number of adenomas remained constant, giving rise to the idea that the adenomas progressed to cancer over the years. If the colonoscopy had been performed before, this fact probably would not have occurred. So, if the colonoscopy was more often performed in patients younger than 75 years, when there is a lower incidence of risks and difficulties, as recommended by the ACP, the development of adenomas into adenocarcinomas would be hindered. The detection of adenomas followed by polypectomy would result in a decrease in CRC incidence in older age groups, decisively contributing to disease prevention.

Our incidence of adenoma in a prospective study for CRC screening, published in 2007, was 29% in asymptomatic individuals aged 50 years and older.<sup>7</sup>

Similar results were seen when patients were divided by age groups into Group A (17-49), B (50-79) and C (80 years and older), with the presence of more polyps in Group B and more CRC in group C.<sup>8</sup>

Therefore, there is no doubt that screening reduces the incidence of CRC. However, factors such as adequate training in the diagnosis and therapy, to perform such procedures as polypectomy, endoscopic mucosal resection, dilation of stenosis, etc. associated with the appropriate volume of examinations, are items that influence the final result.<sup>9</sup>

Likewise, insisting on the quality aspect, one must remember that an incomplete polypectomy with inadequate surveillance would prevent therapeutic conduct that would have been adequate so far.<sup>10</sup> Therefore the results shown in Table 3 emphasize the need to prioritize colonoscopy before individuals become older.

Our preference is to perform colonoscopy after preparation done at home and in outpatient settings. However, many elderly patients do not have anyone to accompany them safely at home, forcing us to review the conduct. Inadequate preparation of the colon was an important factor for the difficulties found during examination in one of our prospective studies.<sup>11</sup> On the other hand, inadequate preparation of the colon is more frequent in the elderly and hospitalized patients.<sup>12</sup>

Virtual colonoscopy, considered non-invasive screening for CRC, has the disadvantage of not being capable to accurately detect lesions smaller than 10 mm in diameter, as well as not being able to remove them and having risks related to ionizing radiation, especially regarding the late aspect, called "stochastic", a factor independent from the radiation dose used and which causes genetic alterations, malformations and eventual development of cancer in the future. Even at reduced doses, its safety and benefits have yet to be assessed, as it is a technique to be used in asymptomatic and potentially healthy individuals.<sup>13,14</sup>

## Conclusions

In patients aged 80 years and older, age is a significant factor regarding the difficulty to perform the examination, adverse effects and complications during colonoscopy. When performed in patients older than 80 years, its preventive effect is apparently boycotted. Prevention means to hinder the ad-

enoma-carcinoma sequence through therapeutic endoscopic resection of adenomas.

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### Conflict of interest

The authors declare no conflicts of interest.

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