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From screening to treatment of Colon Neoplasms: A literature review

Do rastreamento ao tratamento das Neoplasias De cólon: Uma revisão de literatura

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ABSTRACT

Colorectal neoplasms are among the most common types of neoplasms within the global population. Traditionally, they affect the older population. However, in recent years, increasingly younger populations are being diagnosed with this comorbidity. This is due to several factors, such as the development and improvement of screening and diagnostic methods, concomitantly with changes in lifestyles among younger people. Thus, the need to develop and improve treatment techniques naturally arose. This literature review seeks to bring together the main knowledge present in recent years, from screening to treatment of colorectal neoplasms.

Keywords: Colon Neoplasm, Screening, Symptoms, Diagnosis, Treatment.

INTRODUCTION

Colorectal cancer (CRC) is currently the third most common type of cancer in the world, in both sexes. This type of neoplasm is commonly diagnosed in older patients, with the average age of these diagnoses being 66 years for men and 69 years for women (PIÑERÚA-GONSÁLVEZ et al, 2023).

Concomitantly with the incidence in older patients, there has been a reduction in the age range of these tumors in recent years, and since 1990 the diagnosis of CRC has almost doubled for the young-adult population (STOFFEL, Elena M.; MURPHY, Caitlin C, 2020).

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The aforementioned change is mainly due to the increase in screening, better forms of treatment developed, and the reversal in the distribution of risk factors (decrease in the number of people who smoke and increase in the use of aspirin, for example) (STOFFEL, Elena M.; MURPHY, Caitlin C, 2020). The reason for the increased incidence of this disease in younger patients has not yet been properly clarified. Fatty and low-fiber diets, obesity, diabetes, vitamin D deficiency, and smoking are factors that are often present in individuals who develop CRC. (WEINBERG, Benjamin A.; MARSHALL, John L., 2019).

Regarding risk factors, individuals who are related to patients who developed colorectal neoplasms have a higher risk of developing this pathology compared to the rest of the population. This risk increases exponentially if the relative was diagnosed before the age of 45. There are also genetic factors related to oncogenesis that may lead to a higher probability of developing CRC, which may or may not be related to the familial factor (WEINBERG, Benjamin A.; MARSHALL, John L., 2019).

Dietary habits and lifestyle are also epigenetic determinants that predispose to the development of CRC. Among them, processed meat, excessive alcohol consumption, and obesity are internationally accepted as risk factors for this cancer. On the other hand, the practice of physical exercise and diets rich in fiber, grains, calcium and dairy products are considered protective factors for this pathology. (SAITO, Yutaka et al., 2021).

Despite the high incidence worldwide, mortality rates have been reduced in developed countries, in parallel with the increase in developing countries. These rates can be attributed to the successful application of colorectal cancer screening programs in these populations, since early diagnosis tends to allow the treatment of precancerous lesions and better management of colorectal tumors (TOLEDO et al., 2023).

OBJECTIVE

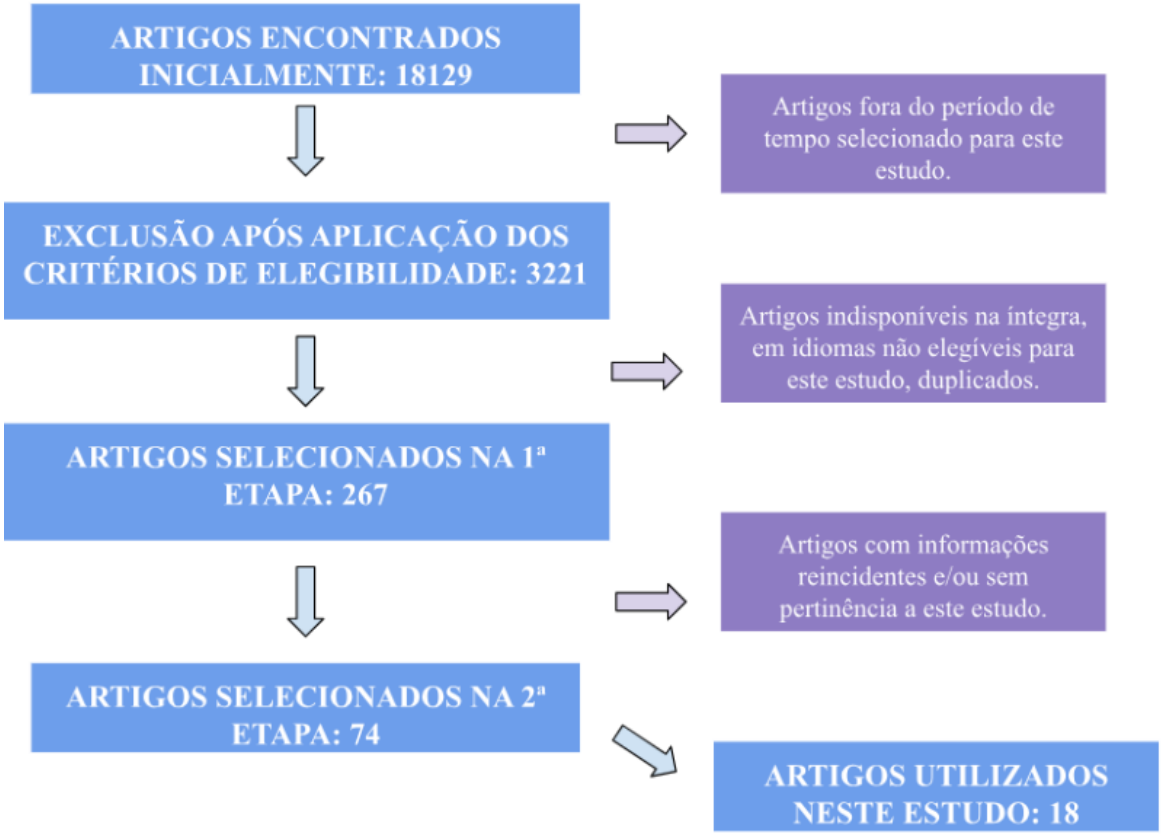
The present study aims to review the most recent literature on the course of colonic neoplasms, focusing mainly on the screening and treatment of these conditions today.

METHOD

This study is characterized as a literature review, consisting of articles found in electronic databases such as PubMed and Scielo. Articles written in Portuguese and English, published during the period from 2019 to 2024 and found from the descriptors "Colorectal Neoplasms", "Screening", "Diagnosis" and "Treatment" and their corresponding terminologies in Portuguese.

Were crossed with the Boolean operator "AND". In addition to the previously mentioned criteria, the following inclusion criteria were also considered: articles available in full and articles with information pertinent to the study. Exclusion criteria were defined as: articles outside the selected time period, in languages other than Portuguese and English, unavailable in full, with information not pertinent to the topic addressed, and duplicates.

Figure 1. Flowchart for the selection of articles used in this literature review.



DISCUSSION

The pathogenesis of colorectal neoplasms occurs mainly from the appearance of dysplasia in the intestinal mucosa, known as aberrant crypts. These preneoplastic lesions evolve into polyps, which over a period of 10 to 15 years may become new neoplasms (DEKKER et al., 2019).

The symptomatology in patients affected by CRC is variable and may present clinical and laboratory manifestations such as: alteration of bowel habits, intestinal obstruction, abdominal pain, feces accompanied by bleeding and anemia. Concomitantly, there are individuals who are asymptomatic until the moment when the disease manifests itself in more advanced stages (DEKKER et al., 2019). More than 75% of CRC diagnoses occur after symptoms develop,

usually associated with more advanced disease (VOGEL et al., 2022). Essential factors that determine the prognosis are: location of tumor onset, its size, and stage at the time of diagnosis (WAHAB et al, 2021).

Goldin, Webber, and Groome (2021) described in their study some factors that influence the time interval from the onset of symptoms to the diagnosis or start of treatment for patients with symptomatic cancer. Thus, it was concluded that the most scientifically debated aspect are individual factors related to the patient or the disease, such as gender, race, socioeconomic status, symptoms, beliefs and culture, thus defining access to health. In addition, gender was the most evaluated individual factor, and a relationship was established between the female gender and the degree of anxiety with a longer time until diagnosis. Other important factors that favor a longer time interval for diagnosis and consequently worse prognosis are: low socioeconomic status, low level of education and abdominal pain.

Traditionally, the age of onset for CRC screening is 50 years. However, advancing screening to 45 years could result in a reduction of 2 to 3 cases of tumors and 1 death in every 1000 individuals who performed the screening correctly. The American Cancer Society, and other American societies of gastroenterology, based on evidence, recommend this modification (GUPTA, Samir., 2022).

In Brazil and other developing countries, colonoscopy is still a distant reality for screening for this type of cancer. Due to its high complexity and cost, this test is mostly performed in large tertiary health centers. Therefore, the strategy used is the fecal occult blood test, which, when positive, indicates the performance of the imaging test (TOLEDO et al., 2023).

Another option used in CRC screening is the fecal DNA test, which consists of analyzing the DNA desquamated from the colonic mucosa. Adenomatous and serrated polyps release cells with altered DNA, which allow the discrimination of these types of lesions through their analysis. The advantage of this test is its non-invasive nature and its high sensitivity for cancer detection, however, its cost is still relatively high and needs to be reduced for it to be a viable strategy (CARETHERS, John M., 2020).

Biennial screening by fecal immunochemical testing (FIT) in regions of Italy demonstrated a 22% reduction in CRC mortality when compared to regions that did not provide this test. The advantages of this test are based on a higher rate of adherence by the patient, since there is no need for preparation (dietary and medication changes) when compared to colonoscopy. In the United States, this test is performed before indication for imaging (LADABAUM, et al., 2020).

FITs and fecal DNA tests have been used worldwide so that their quantitative properties are combined with basic demographic data to create a database with high predictive values for neoplasms. The combination of fecal occult blood testing with age and sex of the individuals also demonstrated good predictive values, reaching 76% accuracy. These strategies are advantageous for settings where colonoscopy is not available to the entire population, allowing for a higher priority for patients at increased risk for this disease (LADABAUM, et al., 2020).

Even with all the tests, colonoscopy is still the final screening test and probably the safest method for preventing CRC. Its major disadvantages are due to the fact that it is an operator-dependent test and the risk of colorectal cancer after colonoscopy. The financial cost is also significant and it is a test that requires prior colonic preparation, with the use of laxatives. At the same time, it is the only test that actively prevents CRC due to the possibility of performing polypectomy, preventing the polyp-adenocarcinoma course, which is often present in this type of cancer (LADABAUM, et al., 2020). The identification of both advanced lesions and preneoplastic lesions characterizes colonoscopy as the great preference, becoming a diagnostic and therapeutic tool (DEKKER et al., 2019).

Khan, Albalawi, and Pottoo (2022) describe that in individuals with more advanced disease, there are several strategies for treatment. Chemotherapy, radiotherapy and surgery are the main tools used to approach these patients.

The greatest challenge currently in the chemotherapy treatment of these lesions is to allow the drugs to correctly reach the neoplastic cells. Thus, priority is given to nanoformulations, which have good biocompatibility and bioavailability characteristics, which are able to penetrate this carcinogenic tissue. Despite side effects such as: nausea, diarrhea, neuropathic symptoms, and aphthous lesions in the oral mucosa, these drugs act by directly preventing tumor growth by blocking or deactivating the responsible oncogenes (KHAN et al., 2022).

Before elective surgery, the patient's carcinoembryonic antigen (CEA) level should be assessed, since this index has been interpreted as an independent predictor of overall survival. Patients with elevated preoperative CEA have a 62% increased risk of death. In this sense, a decrease in CEA in response to chemotherapy treatment has been associated with better survival. Concomitantly, the histological diagnosis should also be confirmed before elective surgical resection. Some benign processes (Diverticulitis, Inflammatory Bowel Disease) may present in a roughly similar form on endoscopy or colon radiography (VOGEL et al., 2022).

In addition to the evaluation of CEA, tumor staging should be performed prior to the beginning of surgical planning. Computed tomography of the chest, abdomen, and pelvis with intravenous and oral iodinated contrast is the most recommended for staging. In patients with an allergy or other contraindication to the use of iodine contrast, a non-contrast PET/CT scan or non-contrast chest CT scan with MRI of the abdomen and pelvis are recommended alternatives. Indeterminate liver lesions identified on CT should usually be further investigated by diffusion-weighted imaging MRI (VOGEL et al., 2022).

Surgical intervention is essential to control larger tumors, especially in cases that can cause changes in the patient's bowel habits. One of the biggest drawbacks of surgery is that a healthy part of the colon eventually undergoes excision as well. The surgical technique consists of dissection of the embryological planes, performing complete mesocolic excision of the affected segment. Associated with surgery, lymphadenectomy (D2 or D3) should be performed for further histopathological analysis (TORKY et al., 2023) (KHAN et al., 2022)(DEKKER et al., 2019).

Minimally invasive surgical approaches (MIC) for CRC, such as multiport laparoscopy, manually assisted single port, and robotic techniques, are preferable because they achieve the same goal as open oncological surgery, but with less pain and decreased length of hospital stay (VOGEL et al., 2022).

In cases where CRC presents in an emergency causing intestinal obstruction, decompression can be attempted with loop or terminal stomas in two mouths, enabling a subsequent reconstruction of the transit in elective surgery, as mentioned above (VELD et al., 2020).

About 20% of patients with colon CA have surgical complications such as bleeding, perforation, or obstruction. For the treatment of these conditions, the objective should be to avoid negative impacts of the emergency (death, sepsis), achieve tumor control, and finally, ensure adequate recovery to start systemic therapy (VOGEL et al., 2022).

Acute GIT bleeding is one of the common possible complications in patients with colon AC. Therefore, resuscitation of the patient associated with an attempt to locate the bleeding site is recommended. Among the techniques used for localization are: computed tomography angiography, conventional angiography, and colonoscopy (VOGEL et al., 2022).

Another complicated form of the disease is patients who have largely metastatic and incurable CRC. These individuals are not candidates for surgical treatment, and a

multidisciplinary approach is recommended for potential palliation, making it possible to ensure symptom relief and maintenance of this patient's quality of life (VOGEL et al., 2022).

FINAL THOUGHTS

Colorectal cancer still remains one of the main types of neoplasms that affect the world population, mainly due to changes in eating habits and the genetic and hereditary components themselves. Screening protocols are currently discrepant, especially when comparing developed and developing countries, and even within the same country there are divergences in the tools and methods used for screening depending on the region and its concentration of tertiary health institutions. The lack of uniformity causes delays in diagnosis and consequently worsens the prognosis of surgical resolution.

It is perceived that this type of cancer is one of the most preventable due to the possibility of polypectomy and consequent interruption of the course of the disease. Therefore, there is an urgent need for greater convergence and better technological distribution of screening methods for this type of neoplasm, enabling a great reduction in morbidity and mortality resulting from this disease.

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