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Correlation between Colonoscopy and Fecal Calprotectin Levels

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Abstract **Original Research Article**

Fecal calprotectin is a protein produced by colonic neutrophils in response to digestive inflammation. A fecal calprotectin level of 50µg/g has been retained in various studies as a negative predictive value for colonic damage. We carried out a retrospective descriptive study in the Department of Gastroenterology, CHU Tangiers, Morocco, on patients presenting with a fecal calprotectin level greater than 50 µg/g. The results of our study show a predominance of females with an average age of 40 years, colonoscopies performed were free of macroscopic abnormalities in 55.5% of cases, colonic diseases identified were mostly in favor of chronic inflammatory bowel disease in 33% and colonic polyps were found last. This result is in line with the Egyptian study, and in contrast with the majority of studies carried out in Europe, where colonic polyps and diverticula were the most common findings. These results could be explained by the young age of our patients, which coincides with the age of discovery of chronic inflammatory diseases, or by their diet, since a Mediterranean diet gives a lower risk of developing polyps and colonic diverticula than a meat-rich diet in the European population, which explains the higher percentage of polyps and colonic diverticula in the European population.

Keywords: Fecal Calprotectin, Colonoscopy, Chronic Inflammatory Bowel Disease, Colonic Polyp Irritable Bowel Syndrome.

INTRODUCTION

Calprotectin is a protein produced by leukocytes in the digestive tract, preferentially in the colon. Its fecal concentration reflects the degree of inflammatory infiltration of the intestinal mucosa, and its measurement has been proposed as a marker of organic damage to the digestive tract.

The aim of this study is to report on colonic damage in patients with elevated calprotectin levels (threshold above 50µg/g).

PATIENTS AND METHODS

Our study is a retrospective descriptive study conducted in the department of Gastroenterology CHU Tangier spread over a period of three and a half years from July 2020 to March 2024, during which 52 endoscopies were performed for diagnostic purposes in patients with a calprotectin greater than 50µg/g, We excluded patients whose fecal calprotectin assay was performed for monitoring purposes.

RESULTS

In our study, 52 patients were investigated by colonoscopy, with a mean age of 40 years and extremes between 16 and 63 years. 67% (n=35) were women and 33% men (n=17), with a sex ratio F/H: 2.

The patients had a medical or surgical history in 64% of cases (n=30), mainly diabetes, hypertension and digestive surgery. Associated clinical symptoms were dominated by liquid diarrhoea in 46% (n=21), constipation in 36% (n=17), and anal fistula in 9% (n=4).

Colonoscopy was carried out, with no macroscopic abnormalities in 55.5% (n=29), showing an appearance in favour of IBD (erythematous mucosa with ulceration, pseudoploype....) in 36% (n=18), digestive polyps were identified in 7% (n= 3).

With fecal calprotectin levels above 1000 µg/g in 89% of colonoscopies returning.

DISCUSSION

Fecal calprotectin was first identified by Fagerhol *et al*., in 1980 [1], it is a protein contained mainly in the cytosol of neutrophils. The presence of mucosal lesions, associated with leukocyte infiltration, leads to an increase in calprotectin, a protein which is resistant to bacterial endoprotease in the intestinal lumen,

and which remains stable for seven days at room temperature.

In most studies, a calprotectin threshold of 50µg/g offers excellent sensitivity and specificity, making it possible to rule out irritable bowel syndrome and avoid up to 2/3 of negative colonoscopies in adults. However, this threshold is more appropriate for adults than for children [2, 3], and this rise in calprotectin levels may be secondary to the use of certain drugs (NSAIDs and PPIs), so it is essential to ensure that these treatments are stopped before sampling.

Our study will report on the results of colonoscopy performed on patients with fecal calprotectin levels above 50µg/g.

In our series, the patients explored were predominantly female, with 67% female and 33% male; this female predominance was also found in Wegner *et al*., [4], in Sweden, with 28% male; however, this predominance was not as evident in the other series, where the percentage of male participants was 45%, in the series by Elias *et al*., [5], in the Netherlands and in the series by Mowat *et al*., [6], in the UK. Gender parity was reported in the Egyptian study [7], with a male rate of 51%.

The mean age of our patients was 40 years, with extremes ranging from 16 to 63 years, a mean age consistent with that found in series from Egypt (El badry *et al*., 7), the UK (Jeffery *et al*., 8) and Italy (corraco *et al*., 9), whereas the mean age was higher in other series from the Netherlands [5], and Sweden [4], where the mean age was 61 and 57 years respectively.

The most frequently reported clinical symptoms were liquid diarrhoea in 46% (n=21), constipation in 36% (n=17), and anal fistula in 9% (n=4), a finding consistent with the series (Mowat *et al*., 6). On the other hand, in other series, abdominal pain was the most frequently reported symptom (Elias *et al*., 5).

colonoscopies returned without macroscopic abnormality in 55.5% (n=28), a result similar to that found in most studies, with a rate of 72% of colonoscopies returning without abnormality in Sweden (wagner *et al*.,), 64% in Switzerland (Manz *et al*., 10) , 57% in Italy (Corraco *et al*., 9) , 86% in the UK (Jeffery *et al*., 8).

In our series, colonoscopies in the second place showed an aspect in favor of chronic inflammatory bowel disease in 36% (n=18), in agreement with the series carried out in Egypt where aspects in favor of IBD were found in 23% of colonoscopies, and thus contrasting with most other studies.

Lastly, digestive polyps were identified in 7% (n=3).

CONCLUSION

In conclusion, our study reveals differences in colonic involvement compared with European populations, probably linked to the young age of our patients and the influence of diet.

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