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THE EVALUATION AND TREATMENT OF HEMORRHOIDS: AN UPDATED SYSTEMATIC REVIEW

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ABSTRACT

Background: *Hemorrhoids are naturally occurring veins in the lower rectum and anus that aid in continence. The severity of pain or discomfort associated with hemorrhoids is influenced by factors such as their size, thrombosis, and location relative to the dentate line. During the history-taking and physical examination, it's crucial to identify risk factors and clinical signs that may suggest more serious underlying conditions.The objective of this study is to conduct an extensive systematic review involving the evaluation and treatment of hemorrhoids based on literature published within the past decade.*

Methods: *The systematic review followed PRISMA 2020 standards and examined full-text English literature published between 2014 and 2024. This review excluded editorials, review papers from the same journal, and submissions without a DOI. Literature was sourced from online platforms such as PubMed, SagePub, and SpringerLink.*

Result: *A total of 1,097 articles s were retrieved from online databases (PubMed, SagePub, and SpringerLink). After three rounds of screening, five articles directly relevant to the systematic review were selected for full-text reading and analysis.*

Conclusion: *Hemorrhoids require proper diagnosis and management. Pregnancy and inflammation increases the risk of hemorrhoids. Conservative treatments work for mild cases, while surgery may be needed for severe ones. Theres an association between hemorrhoids and colorectal cancer, prompting screening recommendations for patients.*

Keyword: *Hemorrhoids, prevention, treatment*

INTRODUCTION

Hemorrhoids are naturally occurring veins in the lower rectum and anus that aid in continence. Hemorrhoids develop due to the enlargement and congestion of the anal cushions, which can progress to prolapse as the condition worsens. Hemorrhoids are prevalent among adults aged 45 to 65, with around 39% of those undergoing colorectal cancer screening having enlarged hemorrhoids, often asymptomatic. Hemorrhoidal disease affects millions worldwide and poses significant medical and socioeconomic challenges. Its etiology includes factors like constipation and prolonged straining.[1]

A classification of hemorrhoids is crucial for selecting appropriate treatments and establishing standardized parameters for scientific research. Hemorrhoids are typically categorized based on location and the extent of prolapse. Internal hemorrhoids occur above the dentate line and are covered with mucosa, while external hemorrhoids occur below the dentate line and are covered by squamous epithelium. The Goligher classification is widely accepted and includes four grades: Grade I involves bleeding without prolapse, Grade II involves piles prolapsing during straining but reducing spontaneously, Grade III involves piles prolapsing during straining and requiring manual reduction, and Grade IV involves irreducible prolapse.[2]

Symptomatic hemorrhoids can present various issues, but it's essential to consider other conditions that may mimic hemorrhoidal symptoms. Symptoms of hemorrhoidal prolapse include itching, bleeding, swelling, prolapse, and leakage due to mucus deposition. Internal hemorrhoids, covered by insensitive mucosa, typically don't cause pain. Thus, if pain is present, further investigation for additional clinical issues is needed. Moreover, around 20% of individuals with hemorrhoids also have anal fissures, necessitating additional treatment alongside hemorrhoids for complete symptom relief.[3]

Proper physical examination for patients with hemorrhoids or anorectal complaints involves several steps: visual examination, digital anorectal exam, and possibly endoscopic options. This examination should include abdominal examination, inspection of perianal tissues, anorectal digital examination, and anoscopy.[2]

Dietary counseling emphasizing fiber and fluid intake is the initial approach for mild symptomatic hemorrhoidal disease. Non-operative treatments aim to re-fixate prolapsed hemorrhoidal tissue and reduce vascularity. However, severe prolapse often requires surgical intervention. Milligan-Morgan hemorrhoidectomy (MMH) was previously a standard surgical technique, but newer methods like closed/open hemorrhoidectomy, bipolar diathermy, stapling, and LigaSure are now available.[3,4] The objective of this study is to conduct an extensive systematic review involving the evaluation and treatment of hemorrhoids based on literature published within the past decade.

METHODS

Protocol

The author carefully followed the rules laid out in the Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) 2020. This was done to make sure the study met all its standards. The selection of this methodological approach was specifically aimed at ensuring the precision and reliability of the conclusions drawn from the investigation.

Criteria for Eligibility

This systematic review examined the evaluation and treatment of hemorrhoids based on literature published within the past decade. This study meticulously analyzed data on literatures to provide insights and enhance patient treatment strategies. The primary objective of this paper is to highlight the collective significance of the identified key points.

Inclusion criteria for this study entail: 1) Papers must be in English, and 2) Papers must have been published between 2014 and 2024. Exclusion criteria comprise: 1) Editorials; 2) Submissions without a DOI; 3) Previously published review articles; and 4) Duplicate entries in journals.

Search Strategy

The keywords used for this research are “hemorrhoids”, “prevention”, and “treatment”. The Boolean MeSH keywords inputted on databases for this research are: *(("haemorrhoid"[All Fields] OR "hemorrhoids"[MeSH Terms] OR "hemorrhoids"[All Fields] OR "hemorrhoid"[All Fields] OR "haemorrhoids"[All Fields] OR "rectum"[MeSH Terms] OR "rectum"[All Fields] OR "haemorrhoidal"[All Fields] OR "hemorrhoidal"[All Fields]) AND ("prevent"[All Fields] OR "preventability"[All Fields] OR "preventable"[All Fields] OR "preventative"[All Fields] OR "preventatively"[All Fields] OR "preventatives"[All Fields] OR "prevented"[All Fields] OR "preventing"[All Fields] OR "prevention and control"[MeSH Subheading] OR ("prevention"[All Fields] AND "control"[All Fields]) OR "prevention and control"[All Fields] OR "prevention"[All Fields] OR "prevention s"[All Fields] OR "preventions"[All Fields] OR "preventive"[All Fields] OR "preventively"[All Fields] OR "preventives"[All Fields] OR "prevents"[All Fields]) AND ("therapeutics"[MeSH Terms] OR "therapeutics"[All Fields] OR "treatments"[All Fields] OR "therapy"[MeSH*

Subheading] OR "therapy"[All Fields] OR "treatment"[All Fields] OR "treatment s"[All Fields])) AND ((y_10[Filter]) AND (clinicaltrial[Filter]))

Data retrieval

The authors assessed the studies by reviewing their abstracts and titles to determine their eligibility, selecting relevant ones based on their adherence to the inclusion criteria, which aligned with the article's objectives. A consistent trend observed across multiple studies led to a conclusive result. The chosen submissions had to meet the eligibility criteria of being in English and a full-text.

This systematic review exclusively incorporated literature that met all predefined inclusion criteria and directly pertained to the investigated topic. Studies failing to meet these criteria were systematically excluded, and their findings were not considered. Subsequent analysis examined various details uncovered during the research process, including titles, authors, publication dates, locations, study methodologies, and parameters.

Quality Assessment and Data Synthesis

Each author independently evaluated the research presented in the title and abstract of the publication to determine which ones merited further exploration. The subsequent stage involved assessing all articles that met the predefined criteria for inclusion in the review. Decisions on including articles in the review were based on the findings uncovered during this evaluation process. This criterion aimed to streamline the paper selection process for further assessment, facilitating a comprehensive discussion of previous investigations and the factors that made them suitable for inclusion in the review.

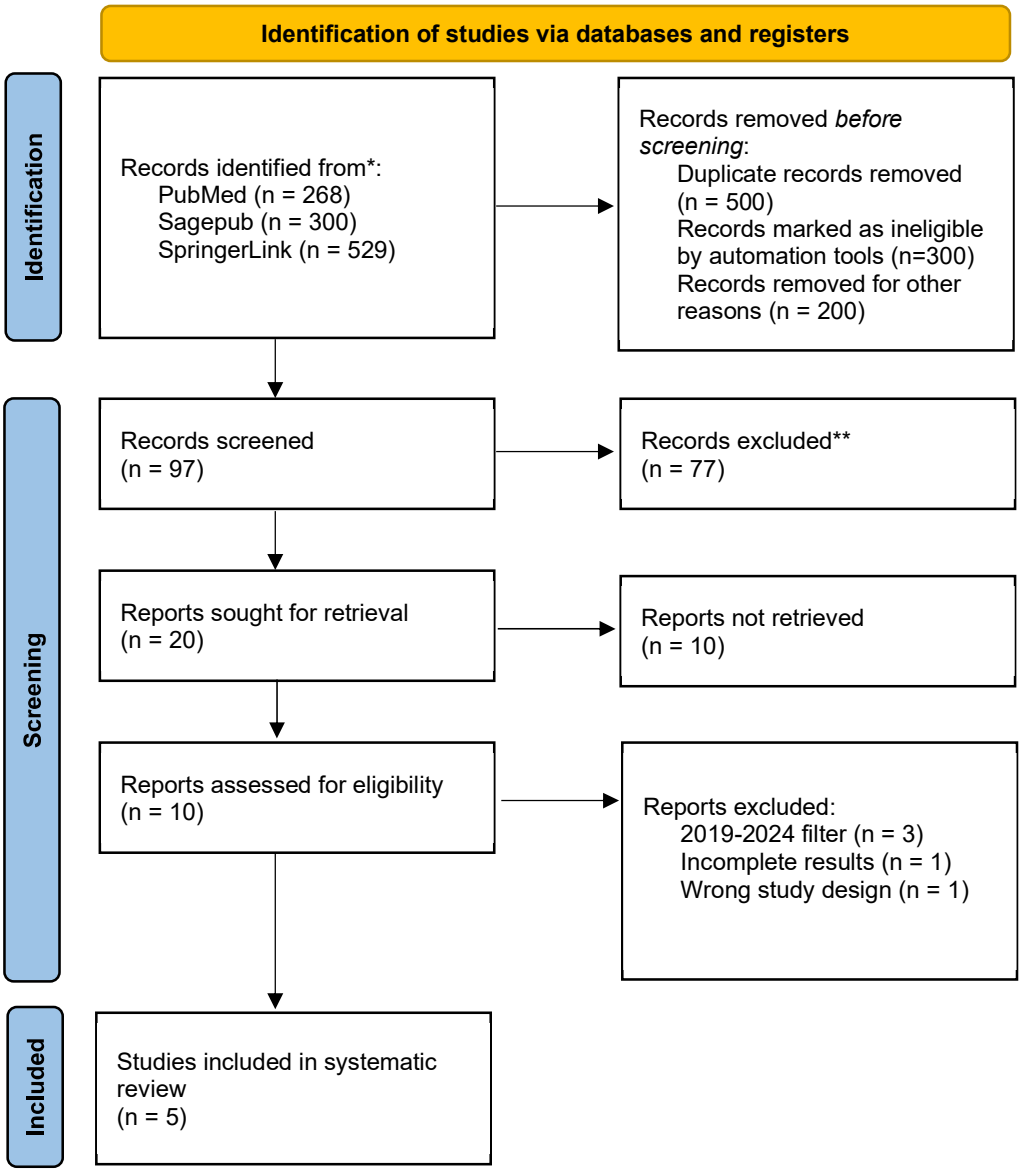

Figure 1. Article search flowchart

RESULT

The initial number of articles retrieved from online databases (PubMed, SagePub, and SpringerLink) is 1,097 articles. After conducting three levels of screening, five articles that directly relate to the current systematic review have been chosen for further assessment through full-text reading and analysis. Table 1 presents the selected literature included in this analysis.

Table 1. The literature included in this study

Author	Origin	Method	Sample	Result
Poskus, et al.[5] (2022)	Multicenter	Randomized controlled trial	405 pregnant women	The intervention group demonstrated a significantly lower hemorrhoid rate compared to the control group upon discharge from the obstetrics unit after delivery, as indicated by intention-to-treat (ITT) analysis (relative risk (RR) 0.38; 95% confidence interval (CI) 0.24–0.59; p<0.001) and per-protocol (PP) analysis (RR 0.42; 95% CI 0.27–0.64; p<0.001). There was no significant difference in spontaneous miscarriage rates between the groups in both ITT and PP analyses. Binary logistic regression analysis highlighted the studied intervention as the sole protective factor. Furthermore, a history of hemorrhoids before pregnancy and an increase in newborn height were associated with a higher risk of hemorrhoids
Serra, et al.[6] (2016)	Multicenter	Prospective study	97 patients with hemorrhoid	In a prospective multicenter study, two groups were examined: group I, consisting of individuals with symptomatic hemorrhoids (Goligher grade I–IV), and group II, composed of healthy volunteers. The study enrolled 97 patients with hemorrhoids, ranging from grade I to IV, and 90 healthy volunteers. Analysis showed elevated levels

				of immunoreactive MMPs and NGAL in all patients with hemorrhoids. Specifically, patients with grade I and II hemorrhoids exhibited higher levels of MMP-1 and MMP-3 compared to controls, while those with grade III showed increased levels of MMP-3, MMP-7, MMP-8, and MMP-9 compared to grade II. Patients with grade IV, particularly those with thrombosed hemorrhoids, displayed notably elevated levels of MMP-9 and NGAL.
Wu, et al.[7] (2021)	Taiwan	Retrospective cohort study	38,864 hemorrhoid patients	This retrospective cohort study investigated the association between hemorrhoids and the risk of colorectal cancer (CRC). Three sets of retrospective cohorts were established using Taiwan's National Health Insurance Research Database, matching individuals with and without hemorrhoids by sex and age or propensity score. Among 36,864 individuals diagnosed with hemorrhoids from 2000 to 2010, the overall incidence rate of CRC was significantly higher compared to the comparison cohort. Adjusted hazard ratios (HRs) indicated a 2.18-fold increased risk of CRC in the hemorrhoid cohort after controlling for sex, age, and comorbidity. Further analysis showed higher CRC incidence rates in the rectum and sigmoid among those with hemorrhoids.
Zagriadskiĭ, et al.[8] (2018)	Multicenter	Observational study	1952 hemorrhoid patients	This multicenter, non-interventional study, conducted as part of the CHORUS survey in

				Russia, involved 80 coloproctologists across nine centers. The study enrolled patients with hemorrhoid complaints who were prescribed conservative treatment based on micronized purified flavonoid fraction (MPFF). Treatment efficacy was assessed at two follow-up visits conducted 5–7 days and 25–30 days after enrollment. Surgical or minimally invasive treatment could be considered if necessary from day 7 onwards. Out of 1952 patients enrolled, MPFF-based conservative treatment effectively eliminated main clinical manifestations in 76.3% of patients, particularly addressing bleeding and prolapse of internal nodes. Invasive treatment was performed in 3.5% of patients with grade IV hemorrhoids and combined with MPFF conservative treatment in 20.2% of patients with grades I–III hemorrhoids.
Aziz Ali, et al.[9] (2022)	Cairo, Egypt	Prospective randomized comparative study	34 patients	Demographic data reveals that the average age of the patients is 40.74 years, with 68% being males and 32% females. Further breakdown between the Milligan-Morgan (MM) and stapled hemorrhoidopexy (SH) groups shows similar mean ages (40.08 years for MM and 40.40 years for SH) and a slightly higher proportion of females in the MM group (48.0%) compared to the SH group (16.0%). Intraoperative findings indicate that the mean duration of surgery was

				comparable between the MM and SH groups (47.20 minutes for MM and 43.60 minutes for SH), with no significant difference observed. However, there was a notable decrease in intraoperative blood loss in the SH group (mean volume of 38.20ml) compared to the MM group (mean volume of 59.80ml), showing statistical significance.

Poskus, et al.[5] (2022) suggested that modifying dietary and behavioral habits can effectively reduce hemorrhoid rates post-pregnancy, offering a safe recommendation for pregnant women. Furthermore, a history of hemorrhoids before pregnancy and an increase in newborn height were associated with a higher risk of hemorrhoids.

Serra, et al.[6] (2016) demonstrated that analysis showed elevated levels of immunoreactive Matrix Metalloproteinases (MMP) and Neutrophil Gelatinase-Associated Lipocalin (NGAL) in all patients with hemorrhoids. MMPs and NGAL may serve as molecular markers for complications such as hemorrhoidal thrombosis.

Wu, et al.[7] (2021) showed that the incidence of colorectal cancer (CRC) is higher in the rectum and sigmoid among those with hemorrhoids. Colonoscopy is recommended for identifying CRC in patients with hemorrhoids, particularly if they have a positive fecal occult blood test result.

Zagriadskiĭ, et al.[8] (2018) concluded that micronized purified flavonoid fraction (MPFF) conservative therapy was effective in relieving hemorrhoidal symptoms, especially in patients with grade I and II hemorrhoids. It was also beneficial in preventing disease relapse and promoting optimal conditions in the postoperative period for patients with more advanced hemorrhoidal disease.

Aziz Ali, et al.[9] (2022) showed that stapled hemorrhoidopexy (SH) outperforms the Milligan–Morgan technique in treating third-degree and fourth-degree circumferential piles. SH demonstrates a significant reduction in intraoperative blood loss and recurrence rate without compromising fecal continence. Although there is no significant difference in the complication rates between the two techniques, including postoperative bleeding, urinary retention, and anal stenosis, SH shows promising advantages in terms of efficacy and outcomes.

DISCUSSION

Hemorrhoids are prevalent worldwide and are among the most troublesome anal conditions, causing symptoms like prolapse and bleeding. The condition poses significant medical and socioeconomic challenges, with constipation and straining being key contributing factors. Hemorrhoids are swollen fibrovascular cushions in the anal canal. Factors like constipation and straining increase the risk. Common symptoms include rectal bleeding, anal pain, masses, hygiene issues, and cosmetic concerns. Anatomically, hemorrhoids consist of mucosa or anoderm lining, stroma containing blood vessels and muscle, and an anchoring system connected to the internal sphincter. Elastic and collagen fibers provide tissue elasticity and strength. Hemorrhoids aid in anal closure and contribute to anal resting pressure.[6]

Proper physical examination for hemorrhoids includes visual inspection, digital rectal exam, and possible endoscopic evaluation. This involves assessing the abdomen, perianal area, and performing anoscopy. Colonoscopy is recommended for all patients with colorectal symptoms, especially older individuals or those with specific risk factors. Flexible sigmoidoscopy may be sufficient for low-risk patients under 50. Anorectal manometry and endosonography are not routine but can aid in surgical planning and assessing tissue changes and sphincter function, respectively.[2]

Previous study showed that pregnancy increases hemorrhoid risk due to factors like increased uterus pressure on veins, hormonal changes relaxing blood vessels, and constipation. Straining during bowel movements exacerbates symptoms. Labor can further strain the pelvic area, worsening hemorrhoids. Pregnant women should manage constipation, maintain a fiber-rich diet, and practice proper hygiene to reduce the risk and alleviate symptoms. A history of hemorrhoids before pregnancy and an increase in newborn height were associated with a higher risk of hemorrhoids.[5]

Another study demonstrated the correlation of increased MMP gene expression in early-stage hemorrhoids (grades I and II) compared to healthy controls. Grade III hemorrhoids showed upregulation of MMPs -3, -7, -8, and -9, while grade IV had increased MMPs -2, -8, -9, and NGAL. Thrombosed and prolapsed hemorrhoids exhibited significantly higher NGAL and MMP-9 levels. These findings suggest inflammation's role in hemorrhoidal disease progression, similar to vascular-related diseases. Diosmin, a phlebotropic drug, may alleviate symptoms by reducing inflammatory markers.[6]

For mild hemorrhoidal symptoms, dietary counseling emphasizing fiber and fluid intake is recommended. Non-operative treatments aim to reduce prolapse and vascularity, but severe cases may require surgical intervention. Recent study by Zagriadskiĭ, et al.[8] (2018) demonstrated that micronized purified flavonoid fraction (MPFF) conservative therapy was effective in relieving hemorrhoidal symptoms, especially in patients with grade I and II hemorrhoids. It was also beneficial in preventing disease relapse and promoting optimal conditions in the postoperative period for patients with more advanced hemorrhoidal disease.[8]

However, severe prolapse often requires surgical intervention. Hemorrhoidectomy is a frequently performed surgical procedure globally due to the high prevalence of hemorrhoidal disease. Various techniques have been developed to minimize postoperative complications, with traditional open or closed methods and stapled hemorrhoidectomy emerging as options. Aziz Ali et al. (2022) found that stapled hemorrhoidopexy (SH) is more effective than the Milligan-Morgan technique for treating third-degree and fourth-degree circumferential piles. SH resulted in significantly reduced intraoperative blood loss and recurrence rates without compromising fecal continence. While complication rates, including postoperative bleeding, urinary retention, and anal stenosis, were similar between the two techniques, SH demonstrated promising advantages in terms of efficacy and outcomes.[9]

Colorectal cancer (CRC) is a prevalent disease and a leading cause of cancer-related deaths globally. Both genetic and environmental factors contribute to CRC risk. Hemorrhoids and CRC share common risk factors like low fiber intake, obesity, and lack of exercise. Symptoms of hemorrhoids, particularly the presence of blood in stool, can resemble those of CRC. This similarity raises concerns about whether hemorrhoids are linked to CRC development. Wu, et al.[7] (2021) showed that the incidence of colorectal cancer (CRC) is higher in the rectum and sigmoid among those with hemorrhoids. As a precautionary measure, screening for CRC is often recommended for patients with hemorrhoids. Colonoscopy is recommended for identifying CRC in patients with hemorrhoids, particularly if they have a positive fecal occult blood test result.[7]

CONCLUSION

Hemorrhoids, common and troublesome, worsened by factors like constipation, require proper diagnosis and management. Pregnancy increases risk. Conservative treatments work for mild cases, while surgery may be needed for severe ones. Concerns exist regarding the link between hemorrhoids and colorectal cancer, prompting screening recommendations for patients. Understanding these dynamics is essential for effective management.

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