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ANTIBIOTIC USE IN PREVENTION OF ANAL FISTULAS FOLLOWING INCISION AND DRAINAGE OF ANORECTAL ABSCESS: A SYSTEMATIC REVIEW

Yusuf Almalik Saputra*

**Faculty of Medicine, Palangka Raya University, Indonesia*

***Corresponding Author :**
saputra.yusuf.almalik@gmail.com

Abstract

Perianal abscess is a condition that arises with an extraordinarily high frequency in general surgery. Despite the fact that the majority of patients reported here suffered from a relatively simple and uncomplicated disease, as estimated retrospectively, the data presented suggest that there is an alarmingly high rate of acquired drug resistance in bacteria detected in purulence swabs from perianal abscesses obtained during surgical drainage procedures in approximately 27% of all patients, especially in patients with a more severe disease. This rate is especially high in perianal abscess patients. The primary objective of surgical treatment for anal fistulain-ano is to obliterate the internal fistulous opening and any associated epithelialized tracks while retaining the anal sphincter's function. Due to the fact that no single surgery is appropriate for the treatment of all fistulas, treatment must be directed by the fistula's etiology and architecture, the degree of symptoms, the patient's comorbidities, and the surgeon's experience. One must consider the trade-off between sphincter division extent, surgical healing rates, and functional compromise. Following incision and drainage of anorectal abscesses, antibiotic therapy is related with a decreased likelihood of fistula formation. An empiric 5-10-day course of antibiotics following surgical drainage may prevent fistula formation in otherwise healthy patients, notwithstanding the low quality of the data.

Keyword: Antibiotic; Anorectal Abscesse; Drainage; Incision; Prevention

INTRODUCTION

An acute infection that is transmitted through ducts associated to anal glands and onto the overlying skin and soft tissue located in the anal area is referred to as a perianal abscess.[1] This type of infection is also known as a cryptoglandular infection. Incision and drainage, abbreviated as I&D, is the most typical method of surgical treatment for a perianal abscess and is routinely practiced in medical facilities all over the world. When dealing with an abscess in the anal region, one of the most prevalent complications is the possibility of recurrence and the establishment of a fistula in-ano after an estimated 7 weeks have passed since the first incision and drainage.[2,3]

A persistent inflammatory condition is the cause of fistula in ano, which is characterized by the formation of an external tract that links the anal crypts to the skin of the anus. After I&D, adults have a 26% to 37% chance of developing this illness.[4] The formation of fistulas following I&D is linked to a number of negative outcomes, including prolonged hospital stays (in situations of difficulties), reoperation (in some cases), patient pain, and increased medical costs.[5] The pathogenesis of fistula development following the incision and drainage of a perianal abscess has been the subject of numerous hypotheses.[6,7]

Because infection of the perianal crypts is thought to be the primary cause of the initial formation of an abscess, one of the hypotheses concerning the development of a fistula postulates that the underlying infection will continue to be present. In the event that a fistula develops, the patient is at an increased risk of developing recurrent abscesses, in addition to the discomfort and anguish caused by the fistula itself.[5] As a result of this, surgeons are being encouraged to pursue preventive modalities to lower the rates of postoperative fistula formation. One such modality is beginning prophylactic antibiotic medication.[8]

Antibiotic treatment is only recommended in exceptional circumstances, such as the presence of broad cellulitis, immunodeficiency, diabetes, or cardiac disease with an artificial valve.[7] Currently, there is no definitive guideline that mandates the use of antibiotics following I&D. There is a lot of debate about the cause of perianal abscess and how to prevent it from happening again, particularly over the part antibiotics play in the formation of fistula in-ano following I&D. In addition, the vast majority of the research that has been done up to this point has been carried out in uncontrolled environments, on relatively small populations, and within the framework of retrospective investigations.[2,9]

In this study, a comparison antibiotic use in prevention of anal fistulas following incision and drainage of anorectal abscesse.

METHODS

Protocol

This investigation's approach was executed in a way that was consistent with the recommendations made by the Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) 2020 standards.

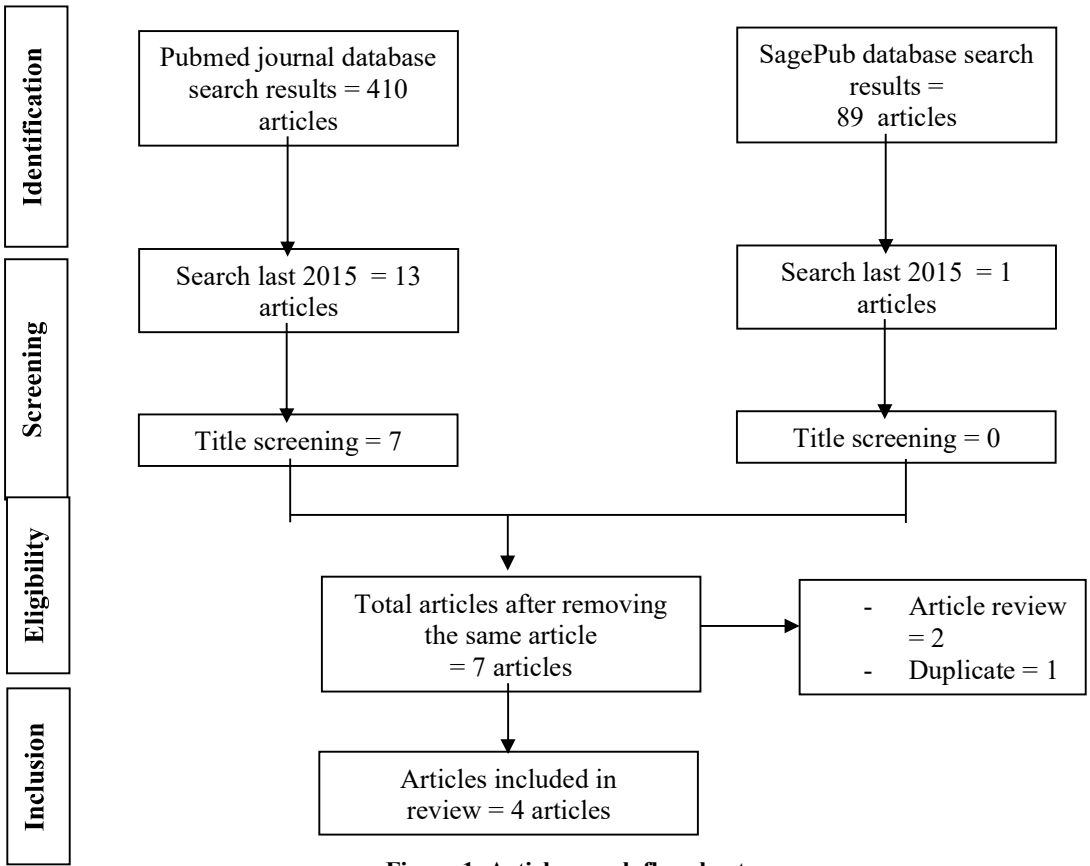

Figure 1. Article search flowchart

Criteria for Eligibility

This literature review seeks to investigate the use of antibiotics in the prevention of anal fistulas following incision and drainage of anorectal abscess by evaluating or analyzing prior studies on the issue. This is a significant problem raised by the present investigation. Researchers participate in studies that satisfy the following requirements: 1) To be accepted for publication, publications must be published in English and focus on the examination of antibiotic treatment in the prevention of anal fistulas following incision and drainage of anorectal abscess. 2) This assessment included articles published after 2015 but prior to the period covered by this systematic review. Examples include editorials, submissions without a DOI, already published review articles, and entries that are substantially similar to those previously published in a journal.

Search Strategy

The search for studies to be included in the systematic review was carried out from January, 27th 2023 using the PubMed and SagePub databases by inputting the words: "antibiotic"; "anal fistulas"; and "prevention". Where *("anti bacterial agents"[Pharmacological Action] OR "anti bacterial agents"[MeSH Terms] OR ("anti bacterial"[All Fields] AND "agents"[All Fields]) OR "anti bacterial agents"[All Fields] OR "antibiotic"[All Fields] OR "antibiotics"[All Fields] OR "antibiotic s"[All Fields] OR "antibiotical"[All Fields]) AND ("rectal fistula"[MeSH Terms] OR ("rectal"[All Fields] AND "fistula"[All Fields]) OR "rectal fistula"[All Fields] OR ("anal"[All Fields] AND "fistulas"[All Fields]) OR "anal fistulas"[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])* is used as search keywords.

Data retrieval

After completing a literature analysis that included an examination of the titles and abstracts of previously conducted research, the author changed the inclusion and exclusion criteria. The newly established criteria are explained in the supplemental materials for this study. This revealed the different facets of the issue that require additional examination, as well as its scope. The author arrived at this result after performing research on numerous other studies with a similar structure. During the process of conducting a systematic review, only papers that met all inclusion criteria were considered. This ensured that only relevant information was discovered throughout the search. Our team did not evaluate research ideas that did not meet all of our evaluation parameters. Thus, it was ensured that a comprehensive examination would be conducted. This endeavor revealed essential information about the studies, including their titles, authors, publication dates, locations, sorts of study activities, and parameters. These are the different widely available product categories. These are abilities that can be acquired via practice. Depending on the information source, this information may be presented in a variety of formats.

Quality Assessment and Data Synthesis

Each author carried out their own independent analysis of a separate piece of research that was stated in the titles and abstracts of the publications before picking which articles to investigate further. After that, we will read the entirety of the articles that are eligible for inclusion in the systematic review based on the inclusion criteria, and based on our findings, we will choose which papers to include in the review. The papers that will be reviewed are selected based on this criteria. in order to simplify the process of selecting articles for the evaluation. Which studies have been conducted that are of a quality that allows them to be included in the review?

RESULT

First study showed conducted with 307 patients. Those who took antibiotics to prevent fistulas (n = 155) were much less likely to get them than those who didn't take any medicine (n = 144; P 0.001). Men were more likely to get fistulas (P = 0.002) than women. Patients who smoked more cigarettes were more likely to get a fistula (P = 0.001). In the univariate analysis, only using antibiotics after surgery helped prevent fistulas (odds ratio = 0.426; confidence interval = 0.206-0.881). In the regression analysis, the use of antibiotics after surgery continued to protect against the development of fistulas (odds ratio [OR] = 0.371; confidence interval [CI] = 0.196–0.703). Male sex was found to be a risk factor for developing fistula in-ano (OR = 3.11; CI = 1.31–7.38).[10]

Pearce, et al (2016)[5] showed the first three weeks, the average number of dressing changes was 13, with a range of 0–21. This resulted in an annual cost to the National Health Service in England of €6,453,360, which was incurred alone by that country. By the eighth week following surgery, approximately 43.8% of patients' wounds had healed, and 86% of patients had returned to their normal level of function. Within the first six months after surgery, approximately 7.6% of the abscesses had returned, and 26.7% of patients had developed a fistula in ano. The patients indicated that their level of discomfort increased by a factor of two to three both during and after the dressing changes.

Hasan, et al (2017)[11] conducted a study with 150 patients, 92% were male and 8% were female. The age range was 20 to 66 years (mean 39.97 ± 0.16 years). Seventy-five of them had perianal abscess and the rest had fistula-in-ano. They were prescribed a course of empiric antibiotics. Patients who had perianal abscess showed an abscess recurrence rate of 10% and 5% after six and twelve months respectively. Perianal fistula formation occurred at the rate of 25% and 5% after six and twelve months respectively when Lincomycin treatment was used. Patients with perianal fistula treated with both

fistulotomy and Lincomycin were followedupfor six and twelve months. Follow-up showed an 11.42% rate of abscess formation after six months, however no recurrence of fistula was found.

Table 1. The litelature include in this study

Author	Origin	Method	Sample Size	Period	Antibiotic	Result
Ghahramani, 2017[10]	Iran	Randomized single blind clinical trial study	307 patients were randomly selected from those referring for incision and drainage	September 2013 to September 2014	Patients were allocated randomly either to receive 7 days of oral metronidazole and ciprofloxacin	Those who took antibiotics to prevent fistulas (n = 155) were much less likely to get them than those who didn't take any medicine (n = 144; P 0.001). Men were more likely to get fistulas (P = 0.002) than women. Patients who smoked more cigarettes were more likely to get a fistula (P = 0.001). In the univariate analysis, only using antibiotics after surgery helped prevent fistulas (odds ratio = 0.426; confidence interval = 0.206-0.881). In the regression analysis, the use of antibiotics after surgery continued to protect against the development of fistulas (odds ratio [OR] = 0.371; confidence interval [CI] = 0.196–0.703). Male sex was found to be a risk factor for developing fistula in-ano (OR = 3.11; CI = 1.31–7.38).
Pearce, 2016[5]	United Kingdom (UK)	Prospective cohort study	141 patients	December 2013 and October 2014	No data	The first three weeks averaged 13 dressing changes (range 0–21), costing the National Health Service €6,453,360 in England alone. By eight weeks following surgery, 43,8% of wounds were healed and 86% of patients were back to normal. By 6 months after surgery, 7.6% of abscesses recurred and 26.7% developed a fistula. Dressing changes increased pain levels by two to three times.
Hasan, 2017[11]	Irak	Observational longitudinal study	150 patients	January 2012 to December 2015	Ampicillin; and Cloxacillin; Amoxicillin + Clavulanate; Cephalosporin; Metronidazole; Gentamicin; Clindamycin HCL	92% of 150 patients were male and 8% were female. 20–66 years (mean 39.97 ± 0.16 years). Seventy-five had perianal abscess and the rest fistula-in-ano. They received empiric antibiotics. After six and twelve months, 10% and 5% of perianal abscess patients recurred. Lincomycin therapy caused 25% and 5% perianal fistulas at six and twelve months. Six and twelve months after fistulotomy with Lincomycin, perianal fistula patients were followed. After six months, 11.42% of abscesses formed, but no fistula recurred.
Seow, 2017[12]	Singapore	Retrospective study	Two hundred and seven patients were admitted for perianal abscesses	January 2011 to December 2011	Amoxicillin / clavulanic acid, metronidazole, clindamycin and ciprofloxacin	One hundred and thirty-four patients (78%) had swab cultures performed intra-operatively but 80% of these were discharged prior to the culture results being available. One hundred and eight (63%) were discharged with outpatient antibiotics. During the index admission and subsequent follow-up, swab culture results were not documented to be reviewed by the attending physician 96.5% of the time. Sixteen patients required repeat surgery for recurrence of anorectal sepsis. We found that the use of antibiotics after the index surgery did not confer a statistically significant benefit.

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DISCUSSION

In general surgery, perianal abscess is a disease that occurs an extremely high percentage of the time. Despite the fact that the majority of patients reported here suffered from a relatively straightforward and uncomplicated disease, as estimated retrospectively, the data presented suggest that there is an alarmingly high rate of acquired drug resistance in bacteria detected in purulence swabs from perianal abscesses obtained during surgical drainage procedures in approximately 27% of all patients, particularly in patients with a complex and more severe disease. This rate is particularly high in patients with perianal abscesses.[13]

The major objective of surgical treatment for anal fistulain-ano is to obliterate the internal fistulous opening and any concomitant epithelialized tracks while preserving the function of the anal sphincter. Due to the fact that no single

procedure is suitable for the treatment of all fistulas, treatment must be guided by the etiology and anatomy of the fistula, the severity of symptoms, the patient's comorbidities, and the surgeon's experience. One must keep in mind the progressive tradeoff between sphincter division extent, surgical healing rates, and functional compromise.[14]

According to the study's findings, adequate post-operative antibiotic therapy aids in the prevention of recurrence in patients with complicated peri-rectal abscesses. These findings also suggested that patients discharged on sulfamethoxazole/trimethoprim, amoxicillin/clavulanic acid, or no antibiotics had a higher rate of recurrence; however, the addition of metronidazole appeared to help prevent recurrence. Based on microbiologic data, an oral regimen covering the typical gram-positive, gram-negative, and anaerobic organisms involved in these infections could include cephalexin plus metronidazole or ciprofloxacin plus metronidazole.[15]

When an abscess has already formed, antibiotic treatment is pointless and just serves to prolong surgery, which in turn allows the suppurative process to advance. In individuals who have severe cellulitis, systemic disease, human immunodeficiency virus infection, or infection by atypical bacteria including tuberculosis, there is some evidence that antibiotics should be used.[16] However, this evidence is limited. Patients who have had bacterial endocarditis in the past, patients who have prosthetic valves, patients who have congenital heart disease, and heart transplant recipients who have valve pathology are all candidates for receiving antibiotics prior to incision and drainage, as recommended by the Guidelines of the American Heart Association.[17]

Anorectal abscess is a potentially incapacitating and distressing illness that may cause substantial pain and fever. Antibiotic utilization and perianal therapy have been the subject of extensive research. However, there is dispute; one study concluded that routine swab cultures are unnecessary and do not impact therapy or outcome, and that the use of postoperative empiric antibiotics may lower the rates of abscess and fistula recurrence.[11] A recent randomized study found that taking oral metronidazole for seven days after incision at a dosage of 500 milligrams every eight hours in conjunction with ciprofoxacin at a dosage of 500 milligrams every twelve hours reduced the risk of developing a subsequent fstula from thirty percent to fourteen and a half percent ($p < 0.001$).[10]

Another concern relates to the kinds of antibiotics that are administered following I&D. According to a study, considering that the majority of the bacteria found in anal abscesses are of enteric origin, beginning treatment with an antibiotic that targets these bacteria may be more effective in preventing the development of fistulas. On the other hand, to this day, no research has shown a significant association between the type of bacteria and the development of fistula in-ano. People who are obese or who drink alcohol regularly can have the incision and drainage procedure, and they can have the same expectations regarding the establishment of fistulas that the typical population does.[3,18]

CONCLUSION

Incision and drainage of anorectal abscesses followed by antibiotic treatment is related with a reduced risk of fistula formation. Although the quality of the evidence is limited, an empiric course of antibiotics lasting between 5 and 10 days after operational drainage may reduce the risk of morbidity associated with the establishment of fistulas in patients who are otherwise healthy.

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