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Anti- hemorrhoids potential of selected medicinal plants used in treatment of Hemorrhoids: A review

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Abstract

Hemorrhoids (Piles) are an inflammation of blood vessels around the anal canal. When the anal cushions are displaced during defecation, piles are formed. The purpose of this study is to document traditional knowledge and medicinal plants used in pile therapy in Nigeria. This study is to establish the usage of beneficial medicinal herbs to cure hemorrhoids and provides a foundation for future research to identify effective and economical anti-hemorrhoid medications.

Keywords: Hemorrhoids; Medicinal plants; Pathogenesis; hypervascularization; Treatment

1. Introduction

Hemorrhoids are anorectal illnesses that affect around 4.4% of the global population and are more prevalent in those aged 45-65 years (Daif *et al.,* 2021). Hemorrhoids, often known as piles, are bulging veins in the lower rectum and anus. The condition is primarily caused by increased pressure in the veins as a result of straining to have a bowel movement or any other action that generates strain (Margetis, 2019). As the pressure rises, blood accumulates in the veins, causing them to enlarge and stretch the surrounding tissue. The disease is a substantial cause of morbidity and has both economic and social consequences for society (Kibret *et al.,* 2021). The economic cost includes a strain on health-care systems and lost workdays, but the social impact is associated with lifestyle choices such as interpersonal, food and hygiene, and sexual habits (Rubbini *et al.,* 2019). Furthermore, the condition produces physical and psychological anguish, as well as a significant reduction in the patient's quality of life due to bleeding with or without defecation, anal pain, and itching (Guttenplan, 2017). Few researches have been undertaken worldwide to investigate the prevalence of hemorrhoids. In Africa, for example, the disease is prevalent at 18% in Egypt and 13.1% in Ethiopia (Kacholi *et al.,* 2022), In Nigeria, no study has been carried out to investigate the prevalence and associated risk factors for hemorrhoids. The reliance on medicinal plants in Africa is due to the scarcity of state-of-the-art health facilities and rural inhabitants' inability to pay for modern treatments and health care. Similarly, the popularity of herbal medicines is attributable to the locals' strong spiritual and cultural tolerance (Kacholi *et al.,* 2022; Sato, 2012). In areas where the use of plants is still prevalent, indigenous knowledge of medicinal plants against various illnesses is well acquired. Medicinal plants serve an important role in primary health care for the majority of Nigeria's rural population. According to studies,

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approximately 5-10% of hemorrhoid patients are hesitant to seek conventional treatment (Dhaswadikar *et al.,* 2022). Inflammation, discomfort, bleeding, and pruritus are all common symptoms of hemorrhoids (Sandler et al., 2019; Sheikh *et al.,* 2020). Hemorrhoid treatment options include cryotherapy, laser treatment, sclerotherapy, hemorrhoidectomy, infrared photocoagulation, and bipolar diathermy (Sakr *et al.,* 2014).

1.1. Clinical Classification of Hemorrhoids

Hemorrhoids are clinically manifested as a prolapsed lump that may require manual reduction or is constantly prolapsed. Other clinical signs include painless bleeding, discomfort, discharge, hygiene issues, soiling, and itching (Bharucha *et al.,* 2022). Hemorrhoids are categorized based on where they are located and the degree of prolapse. Internal hemorrhoids are covered by columnar epithelium and are found above the dentate line. External hemorrhoids, on the other hand, are found below the dentate line and are coated with squamous epithelium. Mixed hemorrhoids are referred to as "interno-external" hemorrhoids since they can be found both above and below the dentate line (K. Gupta, 2022; Khan et al., 2020). Internal hemorrhoids are further graded according to Goligher's classification, which depends on the degree of prolapse into:

- Hemorrhoids of Grade I: Anal cushions bleed without prolapse.
- Grade II hemorrhoids: Anal cushions prolapse when strained but contract on their own.
- Hemorrhoids of Grade III: Anal cushions prolapse with strain or exertion and necessitate manual treatment.
- Grade IV hemorrhoids: The prolapse is irreversible and remains in place at all times (Lohsiriwat, 2015).

1.2. Pathogenesis

Hemorrhoidal cushions are typical anatomic structures that are rarely mentioned until problems emerge, at which point the name hemorrhoid refers to a pathologic condition. The pathophysiology of hemorrhoids is not fully understood (Ganz, 2013; Guttenplan, 2017). It has been determined that there is a link between hypervascularization and the occurrence of hemorrhoids (K. Gupta, 2022; Tradi *et al.,* 2018). When compared to healthy controls, the terminal branches of the superior hemorrhoidal artery in patients with hemorrhoidal illness showed a considerably larger diameter and more blood flow, as well as higher peak velocity and acceleration velocity. However, the most widely accepted theory, the sliding anal canal lining theory, states that hemorrhoidal illness occurs as the supporting tissues of anal cushions disintegrate, causing their downward movement (Cirocco, 2018; Palumbo *et al.,* 2023). A lack of dietary fiber, prolonged straining, constipation, diarrhea, pregnancy, sedentary lifestyle, and a familial history have all been proposed as probable contributors to hemorrhoidal cushion migration. Except during pregnancy, none of these etiologies are well supported by evidence (Johannsson et al., 2005; Sakr et al., 2014). Recent studies examined the role of several enzymes or mediators that may be involved in the degradation of supporting tissues in the anal cushions like matrix metalloproteinase, which was found to be over-expressed in hemorrhoids. Since the discovery of increased microvascular density in hemorrhoidal tissue, neovascularization has been suggested as an important phenomenon in the pathogenesis of hemorrhoidal disease (S. Gupta *et al.,* 2020; Han *et al.,* 2005).

2. Treatment of grade I and grade II hemorrhoids

2.1. Conservative treatment

Life style modification: The initial step in conservative hemorrhoid treatment is to change one's lifestyle so that the patient may avoid extended straining, primarily by reducing the development of hard stool, which can be accomplished by increasing dietary fiber and oral fluid consumption. Other things that may aid in reducing straining include increasing anal hygiene, avoiding needless straining, and avoiding drugs that cause constipation or diarrhea (Chang *et al.,* 2016).

Oral medications: Either as a defensive treatment for early stages of hemorrhoids where prolapse is not considerable, or as a primary control of acute bleeding until decisive office procedures or surgery can be performed. Micronized Purified Flavonoid Fraction contains 90% Diosmin and 10% Hesperidin and has been shown to be effective in the treatment of hemorrhoids. Although it exhibits phlebotonic activity, vasculoprotective properties, and antagonism of inflammatory biochemical mediators, its particular mode of action is unknown.

Topical treatment: There is no evidence to support the use of any of the several over-the-counter topical medicines containing low-dose local anesthetics, corticosteroids, keratolytics, protectants, or antiseptics, according to studies (Chong *et al.,* 2008). These medications are extensively used to ease symptoms; however, long-term usage, particularly of steroid formulations, may be harmful and should be avoided. Other forms of treatment include; Infrared coagulation, Radiofrequency coagulation and Laser therapy.

2.2. Treatment of grade III and grade IV hemorrhoids

Standard treatment (Conventional hemorrhoidectomy) Patients with grades III - IV hemorrhoids should get surgical therapy, according to the new practice standards for the management of piles (Davis *et al.,* 2018).

Other procedures include diathermy hemorrhoidectomy, submucosal hemorrhoidectomy, semi-closed hemorrhoidectomy, and hemorrhoidal artery ligation. These therapies are generally expensive, have severe adverse effects, and do not give complete healing. As a result, scientists are hunting for a medicine that can provide complete relief at a low cost and with few side effects (Godeberge et al., 2021; Lohsiriwat, 2015). Traditional medicines are growing as an alternative source of therapy in numerous disorders due to their potential therapeutic value, which mostly involves medicinal plants and their bioactive molecules. Medicinal plants are thought to be a possible source of phytoconstituents with pharmacological activity (Unadkat et al., 2021).

Table 1 Summarizes the information on some types of plants used in folklore in the treatment of hemorrhoids in Nigeria

S/N	Botanical names	Family name	Common names	Part used	References
1.	*Acacia nilotica (Linn.) Wild ex. Del.*	Fabaceae-Mimo	Bonni	Dried seed	(Soladoye et al., 2010; Sundarraj et al., 2012)
2.	*Aframomum meleguecta (Roscoe) K. Schum.*	Zingiberaceae	Alligator pepper	One bunch	(Ariyo et al., 2020)
3.	*Allium sativum Linn.*	Liliaceae	Garlic	Dried bulb	(Singh et al., 2008; Tesfaye, 2021)
4.	*Angylocalyx oligophyllus (Baker) Baker f.*	Fabaceae- pap.		Fresh leaves	(Olivier, 2012)
5.	*Anogeissus leiocarpus (DC.) Guill. & Perr.*	Combretaceae	African birch, or chewstick tree, Axlewood	Fresh or dried Bark	(Datok et al., 2022)
6.	*Azadirachta indica A. Juss.*	Meliaceae	Neem tree	Fresh or dried Roots	(Moin et al., 2021; Sundaram et al., 2019)
7.	*Bridelia micrantha (Hochst.) Baill.*	Euphorbiaceae	Bridelia, Assas	Fresh or dried Bark	(Bindzi et al., 2020)
8.	*Cassia fistula L.*	Fabaceae-Caes.	Golden tree	Fresh or dry Seed	(Mozaffarpur et al., 2012)
9.	*Gongronema latifolium Benth*	Asclepiadaceae	Swallow apple, Utazi	Fresh or dried Vine	(Ajuru et al., 2017)
10	*Imperata cylindrica (L.) Raeusch.*	Poaceae	Spear grass	Dried root	(Dhianawaty et al., 2021)
11.	*Jatropha gossypifolia Linn*	Euphorbiaceae	Bellyache bush, Red physic nut	Fresh leaves	(Dubey et al., 2020; Nagaharika et al., 2013)
12.	*Khaya grandifoliola C. DC.*	Meliaceae	African mahogany	Fresh or dried Bark	(Soladoye *et al.*, 2010)
13.	*Lophira lanceolata Tiegh. ex Keay*	Ochnaceae	(Dwarf red Ironwood	Fresh or dried Vine	(Dicko et al., 2017)

14.	*Momordica charantia Linn.*	Cucurbitaceae	African cucumber, Bitter cucumber	Fresh leaves	(Daniel et al., 2014)
15.	*Ocimum canum Sims*	Lamiaceae	Saint leaf	Fresh leaves	(Tshilanda et al., 2019)
16.	*Picralima nitida (Stapf) T. Durand & H. Durand*	Apocynaceae	Akuamma plant, Picralima	Dry seed	(Agyare et al., 2013)
17.	*Piper guineense Schum. & Thonn.*	Piperaceae	African black pepper or bush pepper	Fresh or dry Seed	(Soladoye *et al.*, 2010)
18.	*Pteleopsis suberosa Engl. & Diels*	Arecaceae	Rattan palms	Fresh or dried Bark	(Raliat et al., 2019)
19.	*Senna alata Linn.*	Fabaceae-Caes.	Emperor's Candlesticks	Fresh tender leaves	(Igwe et al., 2015)
20.	*Terminalia glaucescens Planch. ex Benth.*	Combretaceae		Fresh or dried Bark	(Baldé et al., 2020)
21.	*Triplochiton scleroxylon K. Schum*	Sterculiaceae	Obeche	Young growing fresh leaves	(Hensel et al., 2015)
22.	*Vernonia amygdalina Delile*	Asteraceae	Bitter leaf	Fresh leaves	(Ugbogu et al., 2021)
23.	*Zea mays Linn.*	Poaceae	Maize	Dried cob from dumping ground	(Soladoye *et al.*, 2010)
24.	*Zingiber officinale Roscoe*	Zingiberaceae	Ginger	Fresh or dried ginger (rhizome)	(MPHIL et al., 2023)

3. Conclusion

This study has supplied the ethnomedicinal foundation for the pharmacological properties of significant medicinal plants and their therapeutic benefits on piles, in addition to documenting traditional medicinal techniques utilized for the treatment of hemorrhoids in Nigeria. This study strengthened the link between indigenous knowledge, ethnomedicinal practices, drug discovery, and pharmacology.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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