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Understanding the Role of Medicinal Plants in Preventing Malaria in Pregnant Women

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ABSTRACT

Malaria remains a significant threat to maternal and fetal health, particularly in sub-Saharan Africa and other malaria-endemic regions. Pregnant women are especially vulnerable due to altered immune responses, which increase the risk of infection, placental parasitaemia, and adverse pregnancy outcomes such as low birth weight, preterm delivery, and maternal anemia. While conventional antimalarial drugs exist, their safety, efficacy, and accessibility for pregnant women are often limited, compounded by increasing resistance among *Plasmodium* species. Traditional medicinal plants, long used by indigenous communities, offer an alternative or complementary strategy for malaria prevention during pregnancy. This paper examines the epidemiology of malaria in pregnancy, highlights the specific risks to maternal and fetal health, and presents an ethnobotanical overview of medicinal plants traditionally used for malaria prevention. It evaluates the phytochemical composition, pharmacological efficacy, and safety profiles of selected species. Furthermore, the paper advocates for integrating evidence-based traditional medicine into formal healthcare systems, promoting sustainable use, documentation, and community education. This holistic approach offers a culturally sensitive and potentially effective supplement to current malaria prevention strategies for pregnant women.

Keywords: Malaria in Pregnancy, Medicinal Plants, Traditional Medicine, Plasmodium falciparum, Antenatal Care, Ethnobotany, Herbal Remedies, Sub-Saharan Africa.

INTRODUCTION

Malaria, a major global health threat, is caused by the Plasmodium protozoa transmitted through infected female Anopheles mosquitoes. Symptoms include fever, chills, and flu-like illness, and without treatment, complications can arise. It is preventable and curable, yet pregnant women and children under five are particularly at risk. Malaria thrives in tropical and subtropical regions, where sudden fevers signify its presence. Recently, there has been a resurgence of malaria and growing resistance to effective treatments. Numerous antimalarial plants and their active compounds have been extensively studied for their properties. In Sudan, many medicinal plants flourish in tropical areas and are often used traditionally by pregnant women to prevent malaria. Investigating these plants for their efficacy against malaria in vulnerable groups is essential for mitigating the impact of this vector-borne disease. Malaria affects over 200 million people yearly in sub-Saharan Africa, with a significant toll on pregnant women and young children, leading to over 30 million affected pregnancies. It can result in severe maternal anemia, low birth weight, stillbirths, and congenital malaria. Understanding the complexities of malaria endemicity and immunity is vital to tackling this disease [1, 2].

Background on Malaria

Malaria is one of the most serious public health issues in the world, especially in tropical countries. It is responsible for about 300–500 million clinical cases and more than 1 million deaths, mostly in children under 5 years of age. Pregnant women are at increased risk for malaria infection, severe disease, and death. In pregnant women, the effects of malaria infection are a cause of low birth weight, preterm birth, reduced growth of the infant, and neonatal death. Many malaria-infected pregnant women, even in

regions of high malaria transmission, are asymptomatic. Malaria is responsible for a quarter of maternal anemia in parts of Africa. Moreover, malaria affects fetuses, leading to low birth weight and premature delivery. Infection with Plasmodium falciparum can occur at any stage of pregnancy, though placental malaria infection is more frequent during peak placental age in the second and third trimesters. This malaria results in an increased risk of preterm birth and low birth weight. Nevertheless, placental malaria may also occur in primigravida with active infections during the first trimester, and this increases the risk of fetal loss and maternal mortality. Asymptomatic malaria infection may be more common in pregnant women than in non-pregnant women in endemic countries, which leads to malaria burden and adverse consequences during pregnancy. Antenatal care services provide ideal contact with the healthcare system, and midwives are usually scheduled to reassure mothers and give education on self-protective measures. Inspecting and clearing breeding sites, burning oils, draining ponds, and organizing larviciding to kill mosquito larvae are community measures, but are incapable of long-term success [3, 4].

Epidemiology of Malaria

Malaria in pregnancy (MiP) is a major public health problem, reportedly affecting 7 million pregnant women each year, nine million pregnancies at risk in Africa alone, and 36.7 million pregnancies in countries where malaria is endemic. Malaria is caused by protozoan parasites of the genus Plasmodium, four of which infect humans: Plasmodium falciparum, P. vivax, P. ovale, and P. malariae. Of these, most of the data regarding MiP comes from studies in Africa, where P. falciparum is the dominant malaria parasite. Nevertheless, P. vivax also infects a significant number of pregnant women and deserves attention in this special issue. MiP events take place in conditions ranging from no risk (i.e. no malaria transmission) to very high risk of malaria (sub-Saharan Africa). The risk of malaria (both infection and clinical disease) is higher in pregnant than in non-pregnant women in the majority of endemic countries, possibly due to immunological and hormonal changes occurring during pregnancy. There has been prolific research on various aspects of MiP, and there is a broad but unevenly distributed knowledge base. New approaches for its control and prevention are missing, a major knowledge gap that could be filled by more concerted research. However, international interest in MiP has recently increased, with parties seeking to redress the balance, so it is anticipated that this knowledge gap will begin to be filled soon. The major morbidities associated with P. falciparum MiP in sub-Saharan Africa include heavy placental malaria, transmission of the parasite to the fetus, and maternal respiratory distress syndrome. The underlying pathology of placental malaria is chronic inflammation, while the fetal infection is active but controlled, as the fetus is immunocompetent. The untreated risks of such events include fetal growth restriction (FGR), stillbirth, neonatal mortality, spontaneous abortion, preterm birth, and maternal anemia and death. The risks of such morbidities diminish, but do not disappear, with the acquisition of immunity (level of protection against the effects of infection/disease) specific to pregnancy. Knowledge of MiP is currently unequally distributed, with Pacific, South, and East Asia, and America receiving little attention; a situation that will need addressing if Gavi-sourced new vaccine candidates come to fruition [5, 6].

Impact of Malaria on Pregnancy

Malaria caused by the parasite Plasmodium falciparum, transmitted by Anopheles mosquitoes, disproportionately affects pregnant women in malaria-endemic areas, leading to several adverse effects on both women and the fetus. Malaria infection in pregnancy is a major public health problem in sub-Saharan Africa, with an estimated 19 million pregnancies per year in areas with stable malaria transmission. P. falciparum malaria poses a risk to pregnancy in the form of maternal illness characterized by febrile illness, malaise, weakness, headache, vomiting, and abdominal pain. P. falciparum can infect the placenta, which may then sequester parasites, leading to placental parasitaemia, resulting in a milieu generating local and systemic levels of pro-inflammatory cytokines and chemokines, damaging the placenta and impairing placental blood, nutrient, and gas transport functions. This reduced placental functional capacity leads to increased risk of intrauterine growth restriction (IUGR), resulting in low birth weight (LBW), which predisposes infants to multiple adverse short and long-term outcomes. Maternal immunity to placental malaria is developed with successive pregnancies, and although largely transferrable, a vaccine to prevent malaria in pregnancy is yet to be commercially available. In resource-poor settings where access to preventive measures is limited or absent, mothers give birth to LBW infants, resulting in increased mortality and morbidity for both mother and child. The need for additional preventative methods is highlighted by the fact that pregnant women continue to be hospitalized for malaria despite the most widely used preventative measures being employed. Some women report not

receiving any preventive measures for malaria in pregnancy in the tropics, and there is suspicion that herbal concoctions/herbal medicines are being used. An arsenal of traditional medicinal plants is utilized in these systems in a particular paradigm. The reason for abdominal pains, swelling, and an abnormal fetal position often elicits the suspicion of a "witch" or "bad" person by the family. A medicinal plant presumed to untangle the fetus is used. The women often perceive malaria and pyrexia in line with evil spirits of deceased kinfolk, and thus traditional healers are sought for herb-drug offerings, rituals, and sacrifices [7, 8].

Medicinal Plants: An Overview

Medicinal plants have been utilized since ancient times, especially in tropical regions, for the purpose of treating various illnesses and health issues. They play a significant role in both the prevention and treatment of malaria, which remains a major concern in many parts of the world today. The guidelines for the traditional application of these plants strongly emphasize the necessity for precautionary measures to prevent potential environmental damage caused by the overharvesting of wild flora. One notable example is Croton megalocarpus, a plant that is greatly esteemed and widely utilized as an antimalarial remedy by the Marakwet people, an ethnic group from Kenya. The prioritization of plants that are most commonly used for malaria treatment within the Marakwet community has led to the identification of 11 different medicinal plants, all of which possess well-documented ethno-pharmacological properties and are employed in the battle against malaria. As the global health landscape continues to evolve, the urgency for developing alternative medicinal therapies to effectively cure or manage malaria is becoming increasingly critical. This is largely due to the growing resistance observed in P. falciparum parasites against the existing synthetic pharmaceutical options. The ongoing quest for effective natural remedies is essential for enhancing the arsenal in the fight against malaria and improving health outcomes for those affected by this devastating disease [9, 10].

Traditional Medicine and Malaria Prevention

Malaria is a major cause of illness and death in developing countries, especially for pregnant women in the WHO African Region, where it poses risks like preterm labor and low birth weight. With rising resistance to standard anti-malarial treatments and poor coverage of preventive measures, many are turning to herbal remedies, known for their affordability and accessibility. However, the plants used by pregnant women for malaria prevention and their safety during pregnancy remain largely unknown. A study aimed to explore the use of medicinal plants among pregnant women in Cameroon, focusing on identifying plants for treating malaria. In Mali, traditional healers are frequently consulted, often bypassing conventional healthcare. A study investigated the plants used by these practitioners for malaria treatment, examining their anti-plasmodial and cytotoxic properties to find leads for further research. The potential of herbal remedies in preventing malaria during pregnancy is currently under investigation, with traditional practitioners asserting that most plant cures are safe for pregnant and lactating women. In rural Mali, traditional practitioners provided insights on treating pregnant women, naming at least 37 species and offering 15 traditional treatments; however, only half could specify the plants used. Many traditional healers were willing to collaborate with conventional healthcare, showing awareness of medical perspectives on pregnancy. This knowledge, shaped by their cultural context, revealed surprising risks for pregnancy that sometimes contradicted traditional beliefs. Health workers noted that combining conventional treatments is common, suggesting the significance of understanding local interactions between these healthcare approaches. The results indicate that it is essential for conventional health care to be aware of these dynamics to avoid undermining efforts by organizations engaged in healthcare initiatives [11, 12].

Specific Medicinal Plants Used

This article highlights 17 medicinal plant species ranked by citation count, detailing their phytochemical profiles and activities against malaria parasites. Memanin A, Phytolaeonocarpins B and C, Phytolaccosides B, C, B, and D exhibit greater potency than chloroquine. Generally, leaves are the primary plant part used, except for Opilia amentacea (stem) and Combretum micranthum (bark). In malaria-endemic areas of Africa, pregnant individuals face heightened risks of infection. Although 4-aminoquinolines are the main malaria treatment, they present challenges like resistance and side effects, particularly for pregnant women. There's a pressing need to enhance the safety and effectiveness of anti-malarial medications for expectant mothers. Traditional medicine remains vital in Bangladesh for healthcare, necessitating research on the safety and efficacy of herbal remedies for malaria prevention and treatment in pregnant women. A study in two malaria-endemic districts explored the medicinal plants

utilized for this purpose, focusing on phytochemical composition, anti-malarial effects, and cytotoxicity. An extensive survey identified three medicinal plant species used by pregnant women to prevent malaria. The research provided insights into their phytochemical profiles. For instance, C. micranthum leaves contain compounds like reshamol, mlose molecule, and various amino acids. Additionally, biologically active chemicals, including gambogenic acid and corilagin, were discovered. The bark of C. micranthum also reveals compounds like psi-4191 and p-lamino-2,6,7-trithioxanthines. Overall, the discovery of these medicinal plants and their active compounds could offer new insights into malaria prevention and treatment strategies for pregnant women [12, 13].

Mechanisms Of Action

Malaria during pregnancy is associated with substantial maternal and fetal morbidity and mortality. Infection with Plasmodium falciparum results in reduced birthweight and increases the likelihood of intrauterine growth retardation, preterm delivery, and stillbirth. Immunity to P. falciparum malaria provides protection against malarial disease in primigravid pregnancies, but this immunity is not protective against placental malaria, which is responsible for most of the adverse consequences of malaria in pregnancy. Available data suggest that the majority of placental infections occur via the transvaginal route; however, Pap smears do not demonstrate that adherent infected erythrocytes are found in the cervix. Indigenous populations, living under laboratory-like exposure conditions, remain asymptomatically infected since early infancy. Genetic diversity in the parasite populations has led to the speculation that the severity of disease is a consequence of the simultaneous infection with multiple strains. Superinfection is understood as the acquisition of a new infection with a different strain after the establishment of chronicity. The rise of parasitemia has two phases, with an initial exponential phase followed by a plateau. Hypotheses on the mechanisms of acquisition and sequestration of infected erythrocytes leading to pathogenesis (immunological) have been implemented in mathematical age-dependent models. Age and immune status heterogeneity increase the complexity of models. Given the character of nonlinear feedbacks in the models, the emergence of a new strain of high virulence can drive the system to a new, less stable equilibria with periodic outbreaks. Several direct and indirect mechanisms have been proposed by which Plasmodium falciparum malaria may adversely affect a nonspecifically vulnerable host's intrauterine pathogenicity. Plasmodium falciparum malaria is the most significant malaria pathogen of heightened public health concern across Africa. Although many efforts have been made to develop malaria vaccines and curative drugs targeting Plasmodium falciparum, and antimalarials provide no protection against the ensuing infection relapses, no safe or effective methods have yet been developed that could confer immunity against malaria throughout pregnancy [14, 15].

Safety and Efficacy

Malaria is a significant infectious disease affecting pregnant women, fetuses, and newborns, making prevention and treatment crucial. Despite the necessity, studies on the safety and efficacy of antimalarial drugs during pregnancy are lacking. A review of the literature found 54 relevant articles out of 76. Malaria infects about 10% of the global population, with pregnant women at increased risk for severe outcomes, including death. In 2018, WHO reported 10 million pregnancies exposed to malaria, with 872,000 at high risk. Fewer than half of at-risk pregnant women received preventive chemotherapy, and access to treatment was below 15% in South-East Asia. WHO guidelines for malaria treatment in pregnancy are inadequate, largely derived from nonpregnant patients. Many antimalarials lack established safety and efficacy during pregnancy. Effective and proven-safe drugs are essential. Recommended medications include chloroquine, amodiaquine, mefloquine, and atovaquone-proguanil. Many approved medications are used prophylactically, while artemisinin derivatives and quinine have extensive use in pregnant women, supported by available safety and efficacy data, though possibly incomplete. Despite positive outcomes for most drugs during pregnancy, some safety and efficacy data remain concerning. The emergence of drug resistance in pregnant women, particularly in Africa, raises alarms about the long-term sustainability of treatment success [16, 17].

Integration of Medicinal Plants into Healthcare

Integration of traditional medicinal plants into existing healthcare systems is crucial for their appropriate and efficient use. Disseminating ethnobotanical knowledge on the prevention and treatment of malaria with medicinal plants to traditional healers, women's groups, and health workers is important. Ethnobotanical results, in conjunction with pharmacological investigations on claimed active plants, should be made available to local healthcare authorities and competent ministries. The general awareness of the public regarding the use of herbal medicine should be enhanced through health education

programs. It would be rational if traditional medicine was adopted into the existing healthcare systems for improved efficiency, sustainability, and safety and, because of the growing awareness of the public regarding the use of herbal medicine, the need of time is a joint effort of all stakeholders. Community recognition and interest in cultural heritage of healing traditions can help revive and promote the herbalist traditions and wisdom, and also ensure forum for people to discuss all medicinal plants. Documentation, preservation, and promotion of indigenous knowledge are as important for local survival as for living sustainably. Therefore, it is imperative to prioritize and get resources for biodiversity and ethnobotanical studies of afro-montane forest to explore the tremendous wealth of flora, fauna, and culture of the region. Graduate level ethnobotanical research programs are gratefully solicited for this endeavor. The herbalist history, healing, and curing traditions of communities can be included in required educational subjects and plans. Aim should be to help them survive and evolve with biodiversity, and their dissemination and sharing with others to sustainably end poverty. Because of the great desirability of the herbalists' world, all knowledge pool/possesses and illuminations can be wisely archived and assembled into collaborative herbalist forum research on best practices in preserving knowledge on indigenous herbalism and culturally diverse healing wisdom [18, 19].

Future Directions in Research

Future direction in malaria research warrants a continued focus on pregnant women, vaccination strategies, and consideration of animal models, with a focus on Plasmodium spp. associated with human disease burden. Consideration of the underlying biological mechanisms of strain-specific differences is crucial for identifying transmission-blocking vaccine candidates. It will be important to fully characterize immune recognition of candidate antigens from variant antigens that bind to variant surface receptors on ECs, matrices, or leukocytes or viral antigens that infect ECs, matrices, or lymphocytes. It will be important to consider whether current vaccines induce strain translatable immune responses and how engendered immune responses result in long-term immunological memory, which is crucial under conditions of exposure and to cover for antigenic diversity. To cater for patient safety, studies with any new drug capability should be undertaken to unravel the timing of transmission-blocking effects. Additionally, methods should be developed to identify the interactions, or lack thereof, between variant proteins and the immune system. Current methods to visualize ECs expressing proteins in vivo should be extended to and/or blockage targeting a variant surface protein, with a focus on measuring variables such as subject transmissibility, parasitaemia, parasitic load, duration/longevity of infection, and immune responses. Closer working of medical professionals with geneticists and bio-informaticians on current scientific questions, such as the adoption of new techniques or the integration of new models and methods, should be undertaken. Additionally, expression of Fc receptors on and binding of sample IgG/sub-class-specific mAbs to different cell types could be characterized for a wider range of cell types. It is important to ask how generalizable association studies for malaria are and to what extent developing world realities differ from developed world assumptions [20, 21].

Ethical Considerations

The World Health Organization (WHO) considers the Ethical Review in a global context and recognizes that different cultural and historical backgrounds may lead to significantly different national frameworks. When evaluating a specific study, it is acknowledged that the conditions under which a study was performed need to be understood. All studies allowed asking questions and, therefore, seeking clarification of the procedures to be followed. When requested, the information was provided, the study was well defined, the obligations and rights of participants were explained, and confidentiality was assured. Indigenous healers were invited to contribute to basic social science research, the emphasis being firmly placed on their expertise in the preparation of plants rather than any medicinal properties thereof. On the other hand, a more limited perspective was found under the viewpoint of some indigenous practitioners. If phrased as being a 'study of malpractice' or a 'study to validate the use of medicinal plants', understandably, almost none were inclined to share the information, although an early acknowledgement of confidentiality had been given. Such explanations tended to be viewed as an extension of Western domination. This unexpected factor of investigation bias made a presentation of the research procedures to the people who participated inexpertly. It is necessary to keep this in mind for research attempts in the future. The willingness to contribute to the documentation of IKS with a greater appreciation of objectives and methodologies might be encouraged. One way of addressing these ethical issues is to allow the participants to appoint their community representatives who would provide continuous feedback to the process. West African indigenous healers see themselves as experts in

something other than the Western pharmacognosist category. The plants employed in the indigenous management of malaria were largely out of the immediate scope of some botanicals and phytochemists. As with human malariotherapy, the focus thus far has been on extractions and constituents of a restricted number of plants shown to be efficacious according to the latter criteria. Given the realization that efficacy in malaria treatment might rest in several co-active compounds, the supplementing potential of other plant extracts may be under-recognized. In recognizing that bioculture needs to be seen as a whole, the possibility remains that bioactive principles and constituents yet unknown exist in any of the 59 plants collected in Mali [22, 23].

CONCLUSION

Malaria in pregnancy continues to present a complex public health challenge, particularly in resource-limited, malaria-endemic regions. The vulnerability of pregnant women to *Plasmodium* infection and its severe consequences for both mother and fetus necessitate innovative and accessible prevention strategies. Medicinal plants, deeply embedded in traditional healthcare systems, provide a culturally relevant and potentially effective avenue for malaria prevention. Several species have shown promising antiplasmodial activity and favorable safety profiles, although further pharmacological and clinical validation is required. Integrating traditional herbal knowledge into national healthcare systems supported by scientific evidence, community education, and policy frameworks can enhance maternal care, reduce malaria burden, and promote biodiversity conservation. Collaborative efforts among researchers, traditional healers, healthcare professionals, and policymakers are crucial in bridging knowledge systems and ensuring safe, sustainable, and equitable healthcare solutions for pregnant women at risk of malaria.

REFERENCES

1. Waiganjo B, Moriasi G, Onyancha J, Elias N, Muregi F. Antiplasmodial and cytotoxic activities of extracts of selected medicinal plants used to treat malaria in Embu County, Kenya. Journal of Parasitology Research. 2020;2020(1):8871375.
2. Sabin L, Hecht EM, Brooks MI, Singh MP, Yeboah-Antwi K, Rizal A, Wylie BJ, Bondzie PA, Banos M, Tuchman J, Singh N. Prevention and treatment of malaria in pregnancy: what do pregnant women and health care workers in East India know and do about it?. Malaria journal. 2018 Dec;17:1-3.
3. Obase BN, Bigoga JD, Nsagha DS. Malaria and HIV co-infection among pregnant women in Africa: prevalence, effect on immunity and clinical management. International Journal of Translational Medicine. 2023 Apr 6;3(2):187-202. mdpi.com
4. Reddy V, Weiss DJ, Rozier J, Ter Kuile FO, Dellicour S. Global estimates of the number of pregnancies at risk of malaria from 2007 to 2020: a demographic study. The Lancet Global Health. 2023 Jan 1;11(1):e40-7. thelancet.com
5. Orish VN, Puplampu PN, Lokpo SY, Kwadzokpui PK, De-Gaulle VF, Marinkovic A, Prakash S, Annan R, Okorie C, Sanyaolu A. Assessing nursing mothers' knowledge, perceptions and uptake of Sulphadoxine Pyrimethamine (IPTp-SP) during pregnancy in the Ho Teaching Hospital of the Volta Region of Ghana. PLOS Global Public Health. 2023 Feb 10;3(2):e0000904. plos.org
6. Gebresenbet RF, Kamaliddin C, Bekele ZM, Teferi M, Tegegne B, Yewhalaw D, Bayih AG, Pillai DR. Active case detection and treatment of malaria in pregnancy using LAMP technology (LAMPREG): a pragmatic randomised diagnostic outcomes trial—study protocol. BMJ open. 2022 Jul 1;12(7):e058397. bmj.com
7. Cirera L, Sacoor C, Meremikwu M, Ranaivo L, Manun'Ebo MF, Arikpo D, Matavele O, Rafaralahy V, Ndombe D, Duran CP, Ramirez M. The economic costs of malaria in pregnancy: evidence from four sub-Saharan countries. Gates Open Research. 2023 May 5;7:47. nih.gov
8. Minwuyelet A, Yewhalaw D, Siferih M, Atenafu G. Current update on malaria in pregnancy: a systematic review. Tropical Diseases, Travel Medicine and Vaccines. 2025 Dec;11(1):1-23. springer.com
9. Million E, Mulugeta T, Umeta B. Traditional medicine practice and its role in the management of malaria in Jimma Town, Oromia, Ethiopia. Infection and Drug Resistance. 2022. tandfonline.com
10. Evbuomwan IO, Stephen Adeyemi O, Oluba OM. Indigenous medicinal plants used in folk medicine for malaria treatment in Kwara State, Nigeria: an ethnobotanical study. BMC Complementary Medicine and Therapies. 2023 Sep 16;23(1):324. springer.com

11. Obeagu EI, Obeagu GU. Neonatal outcomes in children born to mothers with severe malaria, HIV, and transfusion history: A review. Elite Journal of Nursing and Health Science. 2024;2(3):38-58. academia.edu
12. Satapathy P, Khatib MN, Gaidhane S, Zahiruddin QS, Sharma RK, Rustagi S, Al-Jishi JM, Albayat H, Al Fares MA, Garout M, Alrasheed HA. Adverse pregnancy outcomes in maternal malarial infection: A systematic review and meta-analysis. New microbes and new infections. 2024 Aug 30:101474. sciencedirect.com
13. David BG. The Interplay between Anemia and Malaria Treatment Outcomes in East Africa: Implications for Clinical Recovery and Complication Risks. idosr.org. . idosr.org
14. Berhe AD, Doritchamou JY, Duffy PE. Malaria in pregnancy: adverse pregnancy outcomes and the future of prevention. Frontiers in Tropical Diseases. 2023 Aug 14;4:1229735. frontiersin.org
15. Kwizera A, Ntasumumuyange D, Small M, Rulisa S, Moscovitz AN, Magriples U. Assessment of perinatal outcomes of pregnant women with severe versus simple malaria. Plos one. 2021 Feb 19;16(2):e0247053. plos.org
16. Taghipour A, Ghodsian S, Jabbari M, Olfatifar M, Abdoli A, Ghaffarifar F. Global prevalence of intestinal parasitic infections and associated risk factors in pregnant women: a systematic review and meta-analysis. Transactions of the Royal Society of Tropical Medicine and Hygiene. 2021 May;115(5):457-70. [HTML]
17. Unger HW, Acharya S, Arnold L, Wu C, van Eijk AM, Gore-Langton GR, Ter Kuile FO, Lufele E, Chico RM, Price RN, Moore BR. The effect and control of malaria in pregnancy and lactating women in the Asia-Pacific region. The Lancet Global Health. 2023 Nov 1;11(11):e1805-18. thelancet.com
18. Karunamoorthi K, Sabesan S, Jegajeevanram K, Vijayalakshmi J. Role of traditional antimalarial plants in the battle against the global malaria burden. Vector-Borne and Zoonotic Diseases. 2013 Aug 1;13(8):521-44.
19. Johns T, Sibeko L. Women's Perinatal Plant Knowledge: a Case Study on the Compilation and Secondary Analysis of Ethnomedicinal Data. Economic Botany. 2024 Mar;78(1):32-51.
20. Olatunji G, Kokori E, Ogieuhi IJ, Akinmoju O, Omoworare O, Olatunji D, Isarinade DT, Odukudu GD, Abraham IC, Owolabi S, Nasrallah J. Myocarditis in malaria—current evidence and future directions: a literature review. The Egyptian Journal of Internal Medicine. 2025 Jan 7;37(1):6. springer.com
21. Taremwa IM, Ashaba S, Kyarisiima R, Ayebazibwe C, Ninsiima R, Mattison C. Treatment-seeking and uptake of malaria prevention strategies among pregnant women and caregivers of children under-five years during COVID-19 pandemic in rural communities in South West Uganda: a qualitative study. BMC Public Health. 2022 Feb 21;22(1):373. springer.com
22. Gumisiriza H, Olet EA, Mukasa P, Lejju JB, Omara T. Ethnomedicinal plants used for malaria treatment in Rukungiri District, Western Uganda. Tropical Medicine and Health. 2023 Aug 30;51(1):49. springer.com
23. Asaaga FA, Tomude ES, Rahman M, Shakeer I, Ghotge NS, Burthe SJ, Schäfer SM, Vanak AT, Purse BV, Hoti SL. What is the state of the art on traditional medicine interventions for zoonotic diseases in the Indian subcontinent? A scoping review of the peer-reviewed evidence base. BMC Complementary Medicine and Therapies. 2024 Jun 29;24(1):249. springer.com

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