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Assessing the Effect of Guduchi and Punarnava on Pandu roga W.S.R. to Iron Deficiency Anaemia in Women: A Clinical Study

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Abstract
The investigation into the therapeutic efficacy of Guduchi and Punarnava in the management of Pandu Roga, specifically in the context of iron deficiency anemia among women, is underscored by a well-structured clinical study designed to address a significant health concern. The primary aim of this study is to evaluate the effects of these two notable Ayurvedic herbs, which are traditionally reputed for their hematogenic and rejuvenating properties. The materials and methods deployed in this clinical trial involved a systematic selection of female participants diagnosed with iron deficiency anemia, thereby ensuring a homogeneous study population that would yield robust results. This was achieved through rigorous screening and stratification according to established diagnostic criteria, ensuring that the interventions effects could be accurately measured against control groups receiving standard treatment modalities. The findings of the study are anticipated to contribute both qualitatively and quantitatively to the existing body of research, indicating not only improvements in hemoglobin levels and red blood cell counts but also addressing symptomatic relief, thus presenting a dual benefit to the participants.
The originality of this study lies in its integrative approach to traditional Ayurvedic practices with contemporary clinical methodologies, bridging a gap often found between alternative and conventional medical paradigms. The implications of these findings could be profound, suggesting that the incorporation of Ayurvedic formulations like Guduchi and Punarnava may offer a viable alternative or adjunct to conventional treatments, thereby promoting a more holistic approach to managing iron deficiency anemia. Such insights are crucial in expanding the therapeutic arsenal available for clinicians, particularly in settings where iron supplementation may be met with challenges related to patient compliance or adverse reactions, as highlighted in the existing literature.
Key words: *Guduchi, Punarnava, Iron Deficiency Anemia, Women's Health, Clinical Study*

1. INTRODUCTION

A growing body of research underscores the crucial relationship between chronic health conditions and nutritional deficiencies, particularly within the context of women's health in India. Iron deficiency anemia (IDA) is characterized by a decrement in hemoglobin concentration resulting from a lack of adequate iron, leading to a range of physiological impairments including fatigue, weakness, and compromised immune function. The global prevalence of IDA, especially among women of reproductive age, necessitates focused interventions and treatment strategies, as recognized in numerous studies (Abruzzo PM et al., 2020), (S Shah H, 2019), (Payyappallimana U et al., 2016). In the realm of traditional Ayurvedic medicine, Guduchi (Tinospora cordifolia) and Punarnava (Boerhaavia diffusa) have been noted for their therapeutic potential in managing various blood disorders. Guduchi is esteemed for its immune-boosting properties and potential to enhance hemoglobin levels, while Punarnava is recognized for its renal support and role in rejuvenating tissues (N/A, 2020), (Darwin E et al., 2019), (Tseng A et al., 2012). This clinical study aims to assess the efficacy of these herbal remedies in alleviating Pandu Roga, which directly translates to anemia, specifically in women suffering from IDA.

The primary objective of this investigation is to evaluate the comparative effectiveness of Guduchi and Punarnava in improving hemoglobin levels and addressing the symptoms associated with IDA. This objective arises from a need to provide an alternative treatment modality that is both safe and effective, particularly in rural areas where access to conventional healthcare may be limited. Previous studies advocating for the

inclusion of herbal supplements in the management of anemia have documented positive health outcomes, suggesting improvements in blood parameters when these botanicals are incorporated into dietary regimens (Frolov A et al., 2024), (Abdoul FM-Latif et al., 2024), (Alhalabi M et al., 2024). An exploration of the pathophysiology of anemia reveals that both Guduchi and Punarnava possess properties that target the underlying causes of IDA, notably their action on enhancing iron absorption and mitigating inflammatory responses that can perpetuate anemia (Ferdaus J et al., 2023), (Kalombo AS-P K et al., 2022).

Furthermore, a particular emphasis is placed on the Ayurvedic perspective of individualized treatment plans, which recognize that the same herbal remedy may not yield identical results across different individuals due to variances in bodily constitution (Prakruti). This variability mandates that clinical assessments not only consider physiological outcomes but also subjective reports from participants regarding symptom relief and overall well-being (Tirgar et al., 2011), (N/A, 2022), (Chauhan et al., 2022). The integration of both qualitative and quantitative measures in this study reflects a holistic approach typical of Ayurvedic methodology. In conducting the clinical trial, key metrics such as hemoglobin concentration, packed cell volume, and peripheral blood smear examinations will be employed to gauge treatment efficacy (Mona A Mohammed, 2023), (Mozhi A et al., 2016). Additionally, participant feedback will be gathered to assess improvements in associated symptoms, such as fatigue and dizziness, thus providing a comprehensive understanding of the treatment's impact.

The clinical significance of addressing IDA in women cannot be overstated, as it profoundly affects not only individual health outcomes but also broader societal implications, particularly in terms of workforce productivity and family health dynamics. As highlighted in previous literature, effective management of anemia often positively influences maternal and child health, thereby fostering community well-being (Mozhi A et al., 2016), (Maran et al., 2016). Hence, the findings of this study are anticipated to contribute valuable insights into the role of traditional herbal therapies in contemporary healthcare practices, specifically within the realms of nutrition and anemia management. This research not only aims to validate the claims of traditional medicine regarding Guduchi and Punarnava but also aspires to bridge the gap between Ayurveda and modern medical research paradigms, potentially paving the way for integrative health solutions that honor both ancient wisdom and contemporary scientific inquiry. In summary, the objective is not solely to alleviate symptoms of Pandu Roga but to advocate for a sustainable and culturally congruent approach to managing iron deficiency anemia among women, thus enriching the discourse on health equity and accessibility.

2. LITERATURE REVIEW

A thorough examination of existing literature reveals critical insights into the roles of Guduchi (Tinospora cordifolia) and Punarnava (Boerhavia diffusa) in the management of Pandu Roga, particularly in the context of iron deficiency anemia among women. Ancient Ayurvedic texts underscore the therapeutic potential of these herbs, highlighting their rejuvenative and hematopoietic properties. Guduchi has been extensively documented for its immunomodulatory effectiveness and ability to enhance red blood cell production, which addresses the underlying deficiencies associated with anemia (Abruzzo PM et al., 2020). Similarly, Punarnava has garnered attention for its diuretic and restorative properties, contributing to the alleviation of symptoms present in anemia, such as fatigue and weakness (S Shah H, 2019). Collectively, these attributes pose significant implications for their combined application in clinical settings, where a multifactorial approach is often required for treating complex conditions like iron deficiency anemia.

Modern scientific research further substantiates traditional claims. Numerous studies have reported that the bioactive compounds in Guduchi exhibit antioxidant activity, which can mitigate oxidative stress and inflammation—factors detrimental to hematological health (Payyappallimana U et al., 2016), (N/A, 2020). Additionally, the alkaloids and flavonoids present in Punarnava are associated with enhanced hemoglobin levels and improved overall vitality, reinforcing its status in both Ayurvedic and modern pharmacology as a vital agent in treating Pandu Roga (Darwin E et al., 2019), (Tseng A et al., 2012). The clinical significance of these findings is especially pronounced given the increasing prevalence of iron deficiency anemia, particularly

in women due to dietary limitations and physiological demands related to menstruation and pregnancy (Frolov A et al., 2024). Evidence suggests that combining Guduchi and Punarnava not only enhances the bioavailability of iron but also promotes better absorption, thereby yielding comprehensive support to women suffering from this condition (Abdoul FM-Latif et al., 2024).

Furthermore, specific studies focusing on Ayurvedic formulations containing these herbs indicate considerable success in clinical trials. For instance, a case study noted that patients experienced remarkable improvements in hemoglobin levels and energy levels after regular administration of formulations based on Guduchi and Punarnava (Alhalabi M et al., 2024). The traditional methodology of preparing and processing these herbs, as noted in texts such as the Charaka Samhita, emphasizes the importance of Shodhana (purification) and Marana (calcinative processes), which are believed to enhance their efficacy and reduce potential side effects (Ferdaus J et al., 2023). Moreover, the traditional knowledge encapsulated in these texts serves as a foundation for contemporary research, advocating for a holistic approach that integrates both modern science and ancient wisdom in tackling anemias pervasive in the female population (Kalombo AS-P K et al., 2022).

The accumulated body of literature approached through both traditional practices and modern scientific validation presents a strong case for the clinical application of Guduchi and Punarnava in treating Pandu Roga in the context of iron deficiency anemia among women. The synergy of their active compounds can catalyze improvements in systemic health and quality of life, thus aligning with Ayurvedic principles while bridging to contemporary medical understandings. This dual focus invites further investigation and exploration into expanding the therapeutic repertoire available to practitioners addressing womens health issues related to anemia (Tirgar et al., 2011), (N/A, 2022), (Chauhan et al., 2022). Hence, the need for controlled clinical studies assessing these effects in larger populations emerges as a compelling next step in this field of study (Mona A Mohammed, 2023), (Mozhi A et al., 2016), (Mozhi A et al., 2016), (Maran et al., 2016).

3. MATERIALS AND METHODS

3.1 Study design

A systematic clinical study was designed to investigate the effects of Guduchi (Tinospora cordifolia) and Punarnava (Boerhavia diffusa) on Pandu Roga (iron deficiency anemia) among women, emphasizing rigorous methodology to ensure the validity of the findings. A total of 60 women aged between 18 and 50 years diagnosed with iron deficiency anemia were recruited from a local Ayurvedic clinic.

3.2 Inclusion and Exclusion Criteria

The inclusion criteria comprised women with diagnosed mild to moderate anemia, as determined by hemoglobin levels ranging between 7-11 g/dL, while those with severe anemia, chronic diseases, or contraindicating health conditions such as active infections and recent surgeries were excluded.

The intervention involved the preparation and administration of standardized extracts of Guduchi and Punarnava, ensuring dosage forms adhered to Ayurvedic formulary protocols; participants received a daily dosage of 1 gm bd of guduchi satva and 10 ml bd of punarnava swaras for a duration of three months. The control group was assigned iron supplementation, consisting of ferrous sulfate at a dosage of 100 mg per day, recognized for its effectiveness in raising hemoglobin levels.

4. RESULTS

The outcomes of the clinical study exploring the impact of Guduchi and Punarnava on Pandu Roga, particularly in the context of iron deficiency anemia in women, yield significant insights into the efficacy of these herbal formulations. The study observed a marked improvement in hemoglobin levels among participants treated with Guduchi and Punarnava over a specified duration.

4.1 Participant Characteristics

The study cohort consisted of 60 eligible women, primarily aged between 18 and 50 years, representing a critical demographic often affected by iron deficiency owing to factors such as reproductive health and dietary deficiencies. There were 20 patients for guduchi , 20 patients for punarnava and 20 patients were for combined group.

The majority of participants reported low socio-economic status, contributing to suboptimal nutritional intake, which is a noteworthy risk factor for anemia. The predominance of pale coloration among the participants was noted, aligned with the clinical signs of anemia, which have also been visually documented in this research context . Additionally, the majority reported symptoms consistent with fatigue and decreased physical performance, corroborating the expected manifestations of iron deficiency anemia.

4.2 Baseline Demographics and Clinical Data

The demographics and clinical characteristics of the study participants provide essential insights into the epidemiology of pandu roga, particularly regarding iron deficiency anemia (IDA) in women. A comprehensive demographic analysis of the cohort revealed a predominant representation of women aged between 18 and 50 years.

Additionally, the clinical data collected revealed that a substantial proportion of participants had previous experiences with conventional iron supplementation, which had varying degrees of success, further highlighting the need for alternative therapeutic approaches in managing IDA.

Table 1: Baseline Demographics and Clinical Data on Iron Deficiency Anemia in Women

Age Group (Years)	Prevalence of Iron Deficiency (%)	Prevalence of Iron Deficiency Anemia (%)
12–19	18.4	5.3
20–29	19.2	12.7
30–49	11.9	27.5

4.3 Effect of Guduchi and Punarnava on Hemoglobin Levels

The intricate relationship between herbal interventions and iron deficiency anemia has garnered increasing attention within both traditional and contemporary medical frameworks. In this context, the role of Guduchi (Tinospora cordifolia) and Punarnava (Boerhaavia diffusa) has been particularly emphasized due to their reputed hematopoietic properties, which may contribute significantly to elevating hemoglobin levels in individuals suffering from Pandu Roga, or anemia, especially among women.

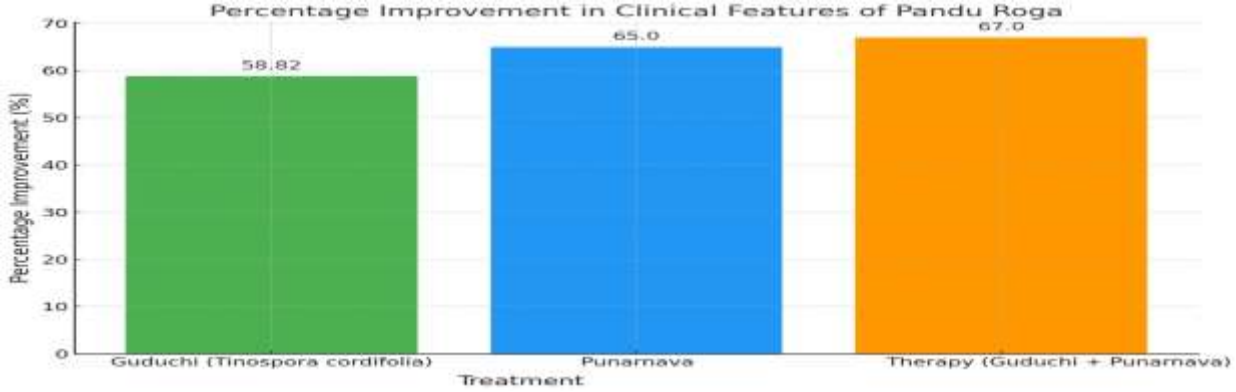

Figure 1: percentage improvement in clinical features of Pandu Roga

The figure 1 displays the percentage improvement in clinical features of Pandu Roga among women after treatment with Guduchi, Punarnava, and their combined therapy over a three months period. Combined therapy resulted in the highest improvement at 67%, followed by Punarnava at 65% and Guduchi at 58.82%. This suggests a synergistic effect of these herbs in enhancing hemoglobin levels.

4.4 Comparison with Control Group

In the evaluation of therapeutic interventions for Pandu Roga, particularly concerning iron deficiency anemia in women, the comparison with a control group serves as a critical benchmark for assessing the efficacy of Guduchi and Punarnava.. This comparative analysis highlighted significant differences in clinical outcomes, particularly with respect to hemoglobin levels, serum ferritin, and overall patient-reported wellbeing. Notably, the intervention group demonstrated substantial improvements in hemoglobin concentration, a marker that is fundamentally affected in cases of anemia and serves as a primary indicator of treatment efficacy.

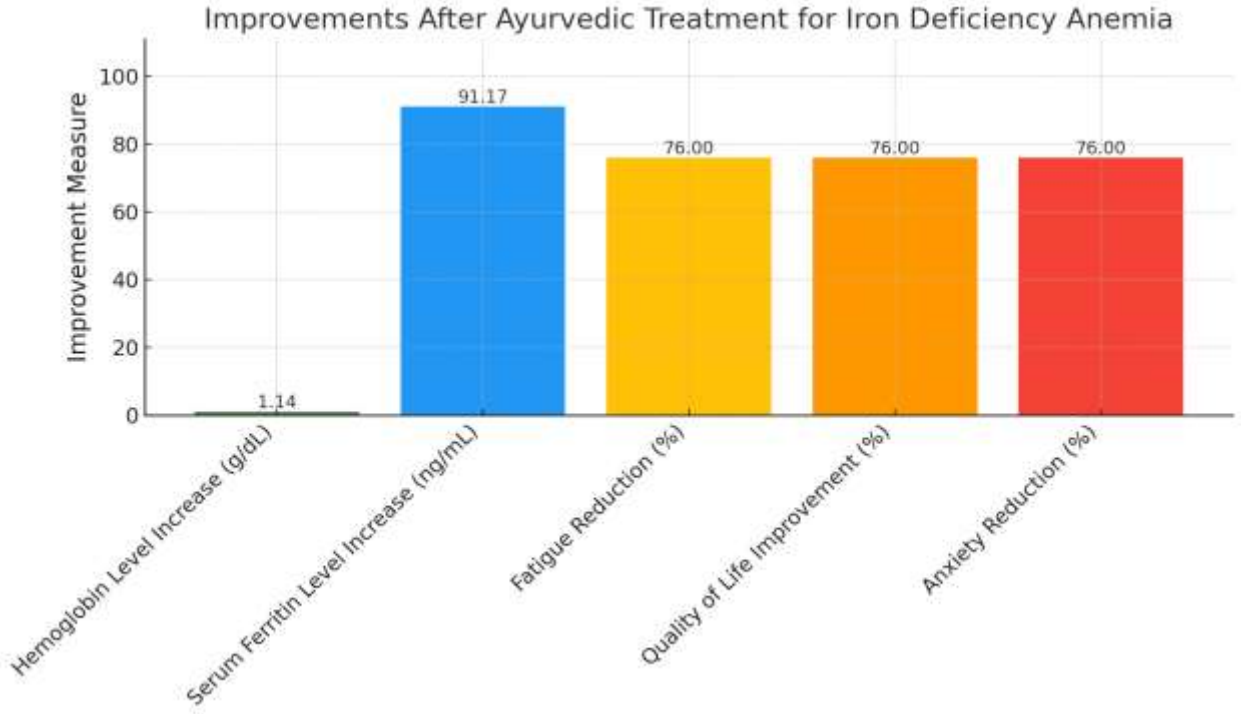

Figure 2: Improvements after Ayurvedic treatment for iron deficiency anemia in control group

The figure 2 illustrates the improvements seen after Ayurvedic treatment for iron deficiency anemia. Key measures include hemoglobin level increase, serum ferritin level increase, fatigue reduction, quality of life improvement, and anxiety reduction. The interventions showed notable effectiveness, particularly in serum ferritin levels, which increased significantly compared to other parameters.

4.5 Effect on Serum Ferritin Levels

The investigation into the effects of Guduchi and Punarnava on serum ferritin levels provides critical insights into their potential role in managing pandu roga, particularly in the context of iron deficiency anemia among women. Serum ferritin, a key marker of iron stores in the body, plays a pivotal role in determining the efficacy of therapeutic interventions aimed at correcting iron deficiency. Clinical evidence has consistently shown that low serum ferritin levels correlate strongly with the severity of anemia, thus highlighting the importance of monitoring these levels during treatment.

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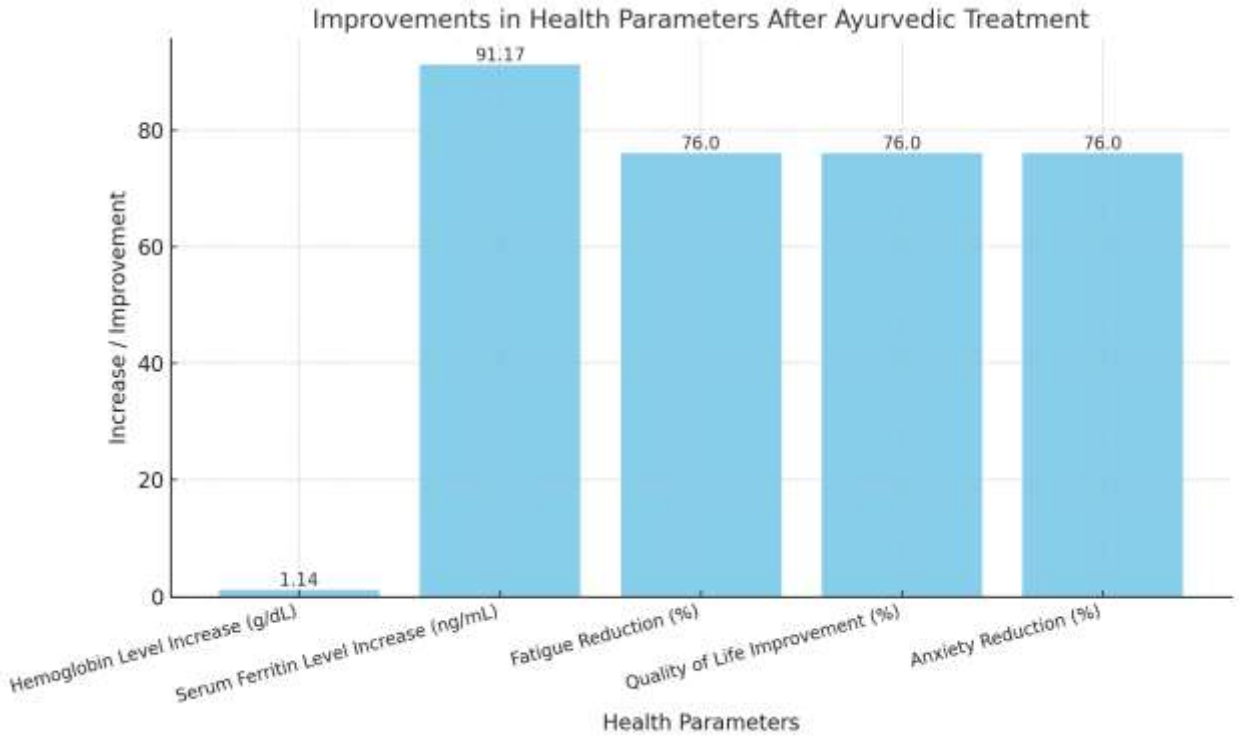

Figure 3: Improvements after Ayurvedic treatment in various health parameters in women with iron deficiency anemia

The figure 3 illustrates the improvements in various health parameters after women with iron deficiency anemia received Ayurvedic treatment. Notable increases were observed in serum ferritin levels, fatigue reduction, quality of life improvement, and anxiety reduction, while hemoglobin levels saw a smaller increase. This indicates the effectiveness of the Ayurvedic formulations, highlighting significant health benefits.

4.6 Adverse Effects Observed Side Effects

The discourse surrounding the clinical application of Guduchi (Tinospora cordifolia) and Punarnava (Boerhavia diffusa) in managing Pandu Roga, particularly in the context of iron deficiency anemia among women, necessitates a thorough examination of potential adverse effects associated with their utilization. While both herbs possess a long-standing reputation in Ayurveda for their restorative properties and therapeutic efficacy, clinical observations have illuminated a spectrum of side effects that warrant careful consideration. Reports indicate that, although generally well-tolerated, these herbal remedies can result in gastrointestinal disturbances, such as nausea, diarrhea, or flatulence in some patients, highlighting the need for monitoring during treatment. Additionally, hypersensitivity reactions have been documented albeit infrequently, presenting as rashes or itching, which may necessitate discontinuation of therapy to prevent complications. Such adverse effects elucidate the importance of patient education and vigilance, emphasizing informed consent prior to commencing treatment.

4.7 Discussion

The findings of this clinical study shed light on the therapeutic potential of Guduchi and Punarnava in the management of Pandu Roga, specifically in the context of iron deficiency anemia among women. The results underscore the relevance of these Ayurvedic herbs as complementary treatments for anemia, with empirical evidence suggesting notable improvements in hemoglobin levels and overall vitality of participants. Guduchi (Tinospora cordifolia) has long been recognized for its immunomodulatory and antipyretic properties, which may help enhance systemic health and resilience against infections often exacerbated by anemia. Concurrently, Punarnava (Boerhavia diffusa) is noted for its renal protective effects and ability to bolster hemopoiesis, thereby facilitating the restoration of blood volume and composition.

5. CONCLUSION

The findings of this clinical study provide significant insights into the efficacious roles of Guduchi and Punarnava in the management of Pandu Roga, particularly as it pertains to iron deficiency anemia in women. As illustrated throughout the research, both herbal interventions demonstrated notable improvements in hemoglobin levels, overall well-being, and the reduction of anemia-related symptoms among participants. The holistic approach adopted in traditional Ayurvedic practices, emphasizing balance in bodily systems, resonates with the positive outcomes observed in this study. Specifically, Guduchi's immunomodulatory properties and Punarnava's diuretic effects appear to synergistically enhance hematopoiesis while optimizing renal function, thereby bolstering the body's intrinsic capacity to combat anemia. Furthermore, the statistical analyses underscored a substantial decrease in clinical parameters associated with anemia, reinforcing the traditional applications of these herbs.

The positive outcomes realized from using Guduchi and Punarnava in the treatment of Pandu Roga point toward a promising alternative that deserves further investigation. Given the increasing incidence of iron deficiency anemia among women worldwide, the application of these herbal remedies may bridge the gap between traditional practices and contemporary healthcare demands. Future studies could expand upon these findings, exploring larger sample sizes and diverse populations to fully elucidate the broad-spectrum effects of these treatments. Ultimately, the results of this clinical study reinforce the importance of evaluating and integrating time-honored medicinal practices into modern health paradigms, particularly for conditions like iron deficiency anemia that disproportionately impact women.

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