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Efficacy of Herbal and Alternative Medicines as Adjunct Therapies for Chronic Kidney Disease Management: A Comprehensive Review

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Abstract

Background: Chronic kidney disease (CKD) significantly impacts patient quality of life and is associated with numerous complications, including uremic pruritus and anemia. Traditional treatments often fail to effectively manage these symptoms, leading to increased patient interest in alternative medical systems (AMS) such as Traditional Chinese Medicine (TCM), Ayurveda, and naturopathy.

Methods: This review systematically analyzes the efficacy of AMS in alleviating CKD-related symptoms through a comprehensive literature search in databases such as MEDLINE, Embase, and Scopus, covering studies published until 2023. Randomized controlled trials (RCTs) focusing on CKD patients utilizing herbal and alternative therapies were included.

Results: The review identified significant benefits of AMS, particularly TCM and Ayurveda, in managing CKD symptoms. Notable findings include a 49% reduction in pruritus symptoms with homeopathic treatments and improved hemoglobin levels in patients receiving TCM therapies. Additionally, herbal remedies like Huangkui and silymarin demonstrated effects on proteinuria and renal function enhancement, respectively. The integration of AMS with conventional therapies showed promising synergistic effects.

Conclusion: The findings indicate that herbal and alternative medicines can serve as effective adjunct therapies in managing chronic kidney disease, particularly in symptom relief and improving overall patient outcomes. However, further large-scale RCTs are necessary to validate these results and establish

standardized treatment protocols. Healthcare practitioners should consider individual patient profiles when incorporating AMS into treatment plans.

Keywords: Chronic kidney disease, alternative medicine, herbal therapies, Traditional Chinese Medicine, patient outcomes.

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Introduction

Chronic kidney disease (CKD) is a predominant worldwide mortality factor, impacting 13.4% of the global population [1]. Deterioration of renal function results in problems associated with chronic kidney disease, including uremia, anemia, and electrolyte imbalances [2]. These problems often present as symptoms including pruritus, discomfort, sleeplessness, and muscular cramps. This thus adversely affects patients' quality of life [3,4]. As individuals with chronic kidney disease (CKD) approach end-stage renal disease (ESRD), the frequency and intensity of these symptoms increase.

Notwithstanding medical advancements and the emergence of novel therapeutics in recent decades, appropriate treatments for many symptoms arising from CKD-related consequences remain ambiguous, perhaps owing to their intricate biology [5]. Uremic pruritus occurs in around 20% of pre-dialysis chronic kidney disease patients and 40% of end-stage renal disease patients [6]. Despite the common use of emollients, gabapentin, and antihistamines, the effectiveness data are often sourced from restricted trials, and their utilization is constrained by side effects [7].

The use of alternative medical systems (AMS), a fundamental component of complementary and alternative medicine (CAM), has risen during the last two decades [8]. AMS is characterized as a "comprehensive system of health theory and practice that evolved independently from conventional medicine" [9]. Approximately 18% of dialysis patients have used some kind of AMS [10,11]. Moreover, the administration of AMS treatments, including traditional Chinese medicine (TCM), by qualified practitioners often mitigates the risk of adverse effects, hence enhancing their attractiveness as viable therapeutic options [11].

Previous research has shown that AMS effectively alleviates symptoms like pain, nausea, and exhaustion in non-CKD patient groups. The use of TCM formulations, including Liu Junzi Tang and Xiao Banxia Plus Fuling, has shown effectiveness in alleviating cancer-related pain and chemotherapy-induced nausea and vomiting [12]. Furthermore, Chinese medicines including Curcuma longa and Panax ginseng have shown effectiveness in inducing apoptosis in cancer cells and suppressing tumor spread in patients with malignancies [13]. Further research demonstrated that a multi-modal Ayurvedic therapy method effectively alleviated symptoms of knee osteoarthritis, including pain and stiffness while enhancing functionality [14]. The growing body of research endorsing AMS has resulted in a surge of healthcare facilities implementing and offering these integrated services, which are backed by insurance coverage [15].

Numerous studies have been undertaken to evaluate the effectiveness of AMS in addressing CKD-related diseases and symptoms, including uremic pruritus and anemia, among patients with chronic kidney disease (CKD). Research evaluating the effectiveness of homeopathic verum in CKD patients demonstrated a 49% decrease in pruritus symptoms after 30 days of therapy [16]. Separate research assessing TCM in patients with glomerulonephritis demonstrated an enhancement in hemoglobin levels after 24 weeks of treatment [16,17].

Current reviews evaluating the role of AMS are restricted to particular indications, including uremic pruritus [18], the application of AMS subtypes in distinct CKD subgroups, such as the utilization of Chinese herbal medicine in diabetic kidney disease, and specific AMS treatments, such as the administration of *Astragalus* [19-21]. This research sought to outline and assess the extensive functions and effectiveness of AMS as viable alternative therapy alternatives for patients with CKD. The review's findings will assist clinicians in comprehending the effectiveness of AMS for CKD patients, therefore permitting informed talks with patients using or contemplating these medications.

Methods

A literature review was performed using MEDLINE, Embase, Scopus, CENTRAL, CINAHL, and PsycINFO. No restrictions were imposed on the commencement date, and investigations conducted until 2023 were included. Searches included essential terminology pertinent to chronic kidney disease (CKD), randomized controlled trials (RCT), and antimicrobial stewardship (AMS).

The Therapeutic Applications of AMS for CKD Patients

Among the four classes of AMS, TCM has been the most extensively researched class, demonstrating effectiveness in ameliorating CKD-related symptoms and outcomes [3,7,22-38]. Among the assessed TCM therapies, Huangkui, TWHF, and acupuncture have shown effectiveness in diminishing proteinuria and alleviating symptoms of uremic pruritus. The treatment foundation of Traditional Chinese Medicine for chronic kidney disease is based on the restoration of vital energy and blood feeding, the elimination of heat and reduction of moisture, and the control of Yin and Yang inside the body. In Western medicine, this is seen as a decrease in inflammation and oxidative stress, together with an improvement in microcirculation and metabolic enhancement [38]. Huangkui, or Abelmoschus manihot, diminishes proteinuria by eliminating oxygen radicals, enhancing circulation and the elimination of immunological complexes, and mitigating inflammation and renal tubular epithelial damage [39]. Triptolide, the principal component of TWHF, inhibits the nuclear factor kappa b (NF-κB) signaling pathway and obstructs the activation of T lymphocytes and certain inflammatory cytokines (TNF-α, IL-1β, IL-6, and IFN-γ), alongside its protective effects on podocytes [40,41]. Two of the studies indicated that the combination of Traditional Chinese medication (TCM) and Western medication, namely the administration of Huangkui capsules and losartan tablets to reduce proteinuria, is more effective than either TCM or Western medicine used alone. This contributes to the current data about the possible uses of Traditional Chinese Medicine in conjunction with mainstream medical care. Patients on TWHF should undergo frequent assessments of potassium levels and liver enzymes owing to the potential risk of hyperkalemia and elevated liver enzymes.

Acupuncture induces the release of endogenous opiate-like chemicals, which are believed to mitigate both peripheral and central itch perception [42]. Far infrared (FIR) therapies that stimulate acupoints have been shown to enhance skin microcirculation, reduce emotional distress, and facilitate waste elimination by enhancing the autonomic nervous system [43-46]. Improved circulation via a more robust autonomic nerve system is hypothesized to alleviate symptoms associated with chronic kidney disease since the progression of renal failure is linked to inadequate circulation in traditional Chinese medicine. Prominent institutions in the United States, like the Mayo Clinic and Duke University Medical Center, have been offering acupuncture alongside other therapies. As data on the effectiveness and safety of Traditional Chinese Medicine (TCM) increases, medical physicians have become more receptive to its use in clinical practice [47]. It is essential to acknowledge that TCM is not devoid of adverse effects. Huangkui should be administered with care in individuals with hyperlipidemia or liver illness since its usage has been linked to increased lipid levels and hepatic damage. Conversely, acupuncture seems to be comparatively safe, exhibiting little side effects, such as discomfort in the elbow. Additional research on Traditional Chinese Medicine is necessary to evaluate its long-term safety profile, and prescriptions should be made with careful consideration of each patient's health status.

In Ayurveda, silymarin is among the most extensively researched therapies that have shown effectiveness in enhancing renal function. Ayurvedic remedies mostly originate from botanical, zoological, and mineralogical sources, physical activity, and lifestyle modifications. They are said to revitalize and eliminate pollutants from the body. In conventional medicine, the therapeutic benefits of Ayurveda for chronic kidney disease (CKD) are attributed to its anti-inflammatory and antioxidant qualities. Silymarin has shown effectiveness in in vitro experiments by reducing inflammatory stress in renal tissue via the inhibition of the NF-κB signaling pathway and subsequent TNF generation [48-52]. Additional Ayurvedic therapies, including the use of capsaicin ointment, were also discovered to relieve uremic pruritus. Topical capsaicin, a natural alkaloid from red chili pepper, has been shown to alleviate uremic pruritus by directly binding to type C sensory neurons, leading to the release of substance P while subsequently inhibiting its production,

transport, and storage [53]. Minimal side effects were noted for the aforementioned Ayurvedic therapy. Although Ayurvedic therapies provide promising advantages, they are now less recognized worldwide than Traditional Chinese Medicine (TCM) [54]. Additional study is required to assess their effectiveness and safety profile to enhance their adoption in clinical practice as supplementary therapies, particularly for patients with chronic kidney disease (CKD).

Naturopathy's distinctive characteristic is the reordering of therapeutic priorities, placing more focus on non-invasive therapies, such as lifestyle changes and diet, rather than medical or surgical procedures. This study examines the intervention using keto analogues of essential amino acids (KAs). The incorporation of KAs into a low-protein diet has shown improvement in renal function and uremia. Reducing protein consumption may enhance renal function in CKD patients by modifying immunologic processes and decreasing hypertrophy and hyperfiltration in the remaining nephrons; however, it may also lead to malnutrition [55-57]. Nonetheless, the supplementation of KAs not only prevents malnutrition by guaranteeing sufficient intake of amino acids but also mitigates uremia [58]. The lack of amino nitrogen in KAs enables them to undergo transamination by assimilating nitrogen from non-essential amino acids, hence diminishing urea synthesis by the reutilization of the amino group [59,60]. The included naturopathic medicines had very few and minor side effects, making them appealing therapy alternatives. Furthermore, due to their non-invasive nature, naturopathic therapies may be readily integrated with conventional drugs. Notably, 28 health systems, hospitals, and cancer treatment facilities in the United States presently employ at least one licensed naturopathic physician on-site [61]. As research increasingly assesses the effectiveness and safety of naturopathic therapies, its potential function as an additional therapy for CKD patients is expected to grow in the future.

Finally, homeopathy has shown effectiveness in alleviating symptoms and enhancing outcomes associated with chronic kidney disease (CKD). Homeopathy is the therapeutic use of medicines sourced from plants, minerals, or animals that elicit responses mirroring the clinical symptoms of illnesses. This review indicates that Brazilian green propolis tablets enhance renal function, whereas homeopathic verum medicine alleviates uremic pruritus. Brazilian green propolis has been found to enhance renal function in many ways. Initially, it diminishes proteinuria by mitigating urinary oxidative stress and macrophage infiltration in the kidneys [62]. Secondly, chrysin, a flavonoid present in propolis, has shown the ability to reduce podocyte apoptosis in individuals with diabetic nephropathy and mitigate glomerular damage [63]. Finally, propolis has shown the ability to lower blood pressure via acetylcholine-induced vasodilation and its antioxidant characteristics [64-68]. No harmful effects were observed in the investigations concerning the safety of homeopathic medication. Nonetheless, the use of homeopathy is somewhat limited, since 36% of states in the United States mandate that homeopathic practitioners be licensed in either Western medicine or Naturopathic medicine [32]. Therefore, more study is required to confirm the effectiveness and safety of homeopathic treatment as a supplementary therapy for patients with chronic kidney disease (CKD).

Constraints

The following constraints must be taken into account with this evaluation. Initially, the clinical and methodological heterogeneity of the research precluded the execution of meta-analyses. With the expanding database for AMS trials in CKD patients, future reviews have to contemplate using meta-analyses to evaluate the effectiveness of AMS therapies for this population. Moreover, there may have been the exclusion of potentially relevant papers despite the use of a comprehensive search method. To mitigate this, the references of the included papers were manually examined as an element of our search approach. A further restriction of the research pertains to the inclusion of just English-language publications. Researchers need to include findings in other languages, including Chinese and Tamil, in the next evaluations. Ultimately, although the findings of the included trials were presented as normalized Z scores, caution is warranted in interpreting these values and in comparing the effectiveness of different AMS classes. This results from significant variability in the sorts of outcomes assessed, as well as the comparison groups and assessment instruments used. It is anticipated that further standardization of study outcomes

for AMS treatments in forthcoming research would provide more meaningful comparisons of the effectiveness across various AMS classes via these normalized Z scores.

Conclusions

This analysis indicates that TCM and naturopathy were the most extensively researched alternative medical systems, demonstrating benefits in enhancing renal function, reducing proteinuria, and alleviating uremic pruritus in patients with chronic kidney disease (CKD). Most investigations had a limited patient cohort, and bigger randomized controlled trials are needed for further evaluation and validation of these putative AMS remedies. Healthcare practitioners intending to integrate AMS into routine practice should customize therapy according to each patient's health status and be aware of any potential harmful effects.

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فعالية العلاجات العشبية والبديلة كعلاجات مساعدة لإدارة مرض الكلى المزمن: مراجعة شاملة

الملخص

الخلفية: يؤثر مرض الكلى المزمن (CKD) بشكل كبير على جودة حياة المرضى ويرتبط بالعديد من المضاعفات، بما في ذلك الحكة البولية وفقر الدم. غالبًا ما تكون العلاجات التقليدية غير كافية في إدارة هذه الأعراض بشكل فعال، مما يزيد من اهتمام المرضى بأنظمة الطب البديل (AMS) والأيورفيدا والطبيعة العلاجية (TCM) مثل الطب الصيني التقليدي.

الطرق: تُحلل هذه المراجعة فعالية أنظمة الطب البديل في تخفيف أعراض مرض الكلى المزمن من خلال بحث شامل في قواعد بيانات مثل MEDLINE وEmbase وScopus حتى 2023، مع تغطية الدراسات المنشورة التي تركز (RCTs) . تم تضمين التجارب العشوائية المضبوطة الذين يستخدمون العلاجات العشبية والبديلة CKD على مرضى.

النتائج: تضمنت النتائج CKD. كشفت المراجعة عن فوائد كبيرة لأنظمة الطب البديل، خاصة الطب الصيني التقليدي والأيورفيدا، في إدارة أعراض TCM. البارزة انخفاضًا بنسبة 49% في أعراض الحكة مع العلاجات المثلية وتحسن مستويات الهيموغلوبين لدى المرضى الذين تلقوا علاجات تأثيرات على البروتين البولي وتحسين وظائف الكلى على التوالي. *silimarin* و*Huangkui* بالإضافة إلى ذلك، أظهرت العلاجات العشبية مثل وأظهرت دمج أنظمة الطب البديل مع العلاجات التقليدية تأثيرات تآزرية واعدة.

الاستنتاج: تشير النتائج إلى أن العلاجات العشبية والبديلة يمكن أن تكون علاجات مساعدة فعالة في إدارة مرض الكلى المزمن، خاصة في تخفيف الأعراض وتحسين النتائج العامة للمرضى. ومع ذلك، هناك حاجة إلى إجراء تجارب عشوائية مضبوطة واسعة النطاق لتأكيد هذه النتائج ووضع بروتوكولات علاجية موحدة. يجب على مقدمي الرعاية الصحية مراعاة الملفات الشخصية الفردية للمرضى عند دمج أنظمة الطب البديل في خطط العلاج.

الكلمات المفتاحية: مرض الكلى المزمن، الطب البديل، العلاجات العشبية، الطب الصيني التقليدي، نتائج المرضى.