A review on Punarnavadi Kwath: An Ayurvedic polyherbal formulation for Chronic Kidney Disease (CKD)

Santosh Panwar¹, Ram Kishor Joshi², Udaí Raj Saroj³

¹Post Graduate Scholar, Department of Kayachikitsa, Faculty of Ayurveda, NIA, Jaipur, Rajasthan, India.
²Professor & Head, Department of Kayachikitsa, Faculty of Ayurveda, NIA, Jaipur, Rajasthan, India.
³Professor, Department of Kayachikitsa, Faculty of Ayurveda, NIA, Jaipur, Rajasthan, India.

ABSTRACT

Chronic kidney disease (CKD) is defined by persistent urine abnormalities, structural abnormalities, or impaired excretory renal function suggestive of a loss of functional nephrons. Most patients with CKD are at risk of accelerated cardiovascular disease and death. Punarnavadi Kwath is a formulation, which contains nine medicinal plants viz. Boerhavia diffusa, Barberis aristate Dc. Curcuma longa, Zingiber officinale Roxb, Terminalia chebula Retz. Tinospora cordifolia (Willd.), Plumbago zeylanica Muell Arg, Clerodendron serratum, Cedrus deodara (Roxb) Loud. These herbs have the potential to treat symptoms of CKD like inflammation and pain other than that, the goal of treatment is to improve kidney function, reduce symptoms and prevent complications. This review paper emphasized on a comprehensive information for each herb of Punarnavadi Kwath because pharmacology, mechanism of actions based on various preclinical studies, safety precautions along with the current research potential of the herb. At the same time, the probable pharmacodynamic action of drugs is drawn to know the imperative for optimal and safe utilization of the herb, are discussed in this review paper.

Key words: Ayurvedic Medicinal Plants, Chronic Kidney Disease, Punarnavadi Kwath, Uraemia

INTRODUCTION

Chronic kidney disease (CKD) is defined by persistent urine abnormalities, structural abnormalities, or impaired excretory renal function suggestive of a loss of functional nephrons. Most patients with CKD are at risk of accelerated cardiovascular disease and death. For those who progress to end-stage renal disease, the limited accessibility to renal replacement therapy is a problem in many parts of the world. India like any other developing country is facing a silent epidemic of chronic renal failure (CRF-a) facet of the health transition associated with industrialization partly fuelled by increase in sedentary lifestyle, low birth weight and malnutrition. India has very little infrastructural renal care facilities with few centres that too being placed at major cities only. Indian Government spends very less on health each year and patients are supposed to attend its primary health centres. Patients do not attend because in doing so they lose a day’s wages. A normal person in India cannot afford this high costing treatment that too for an incurable disease- CKD. If still can afford it, these costs have to be borne for life time. This puts an unbearable load on the patient and his/ her family. This is the most important reason why only 2-3% of Kidney failure patients in India get treated. Rest prefers an early death so to decrease the financial burden on their kith and kins.[1] The conventional approach of management includes dialysis and renal transplantation which is not affordable and acceptable by Indian populations. Therefore, exploration of safe and alternative therapy is highly needed which proves...
to be helpful on reducing requirement of dialysis and in postponing the renal transplantation. Over the next decade, the number of patients with end-stage renal disease requiring renal replacement therapy is sure to increase by many folds worldwide posing a difficult situation to overcome with respect to economy and health of the working and earning population of the nation. There is an urgent need to explore, highlight and modify modifiable risk factors as a basis for treatment strategies to prevent the development and progression of CKD.

Ayurveda is a traditional system of medicine that originates in India thousands of years ago. It is based on principle of balance and harmony between the body, mind and spirit. In Ayurveda, Chronic Kidney Disease is known as disease of the Mutravaha Srotas, which are the channels responsible for the elimination of the urine. Ayurvedic treatment for chronic kidney disease typically involve a combination of dietary changes, herbal remedies, and life style modifications. The goal of treatment is to improve kidney function, reduce symptoms and prevent complications. These significantly correct uremia which is the cardinal feature of the CKD and improve the renal function which is evident by reduction in serum creatinine and blood urea. In addition, the treatment also improves the general condition of the patient.

**Aim**

To review the properties and action of Punarnavadi Kwath on CKD

**Drug Review**

1. **Punarnava**

   Botanical Name: *Boerhavia diffusa* (Linn.)
   Family: *Nyctaginaceae*
   Classical Names of Punarnava
   Sanskrit: Punarnava, Rakta Pushpa, Shilaatikaa, Kshudravarshabhu, Varshaketu, Kathillaka
   Hindi: Gadapurna, Thikari, Sant, Biskhafra
   English: Spreading Hogweed

   **Chemical constituents:**
   Punarnavoside, hoeravinones A, B, C, D and E, liriodendrin, syringaresinol mono- β-D glucoside, flavones, sterols, isofuroxanthone, boeravine, hypoxanthine-9-Larabinofuranoside.

   **Pharmacological Activities:**
   Diuretic, anti-inflammatory, antiviral, anticonvulsant, cardiotonic, antihypertensive, hepatoprotective, antibacterial, significant antifibrinolytic.

   **Therapeutic Use:**
   Shotha, Netra Roga, Agnimandhya, Vibhandha, Udararoga, Hridroga, Pandu, Kasa, Shwasa, Urahkhata, Raktapradara, Mutrakrichchhra, Kushtha, Jwara

2. **Darunisha**

   Botanical name: *Barberis Aristate Dc.*
   Family: *Berberidaceae*
   Synonyms:
   Hindi: Daru Haldi
   English: Indian beri beri

   **Chemical constituents:**
   Berrberine, berbamine, oxycanthine, epiberberine, palmatine, dehydrocaroline, jatrorrhizine and columbamine

   **Pharmacological activities:**
   Anti-microbial, anti-inflammatory, analgesic, anti-pyretic, hepatoprotective, immunomodulatory and cardiotonic activity.

   **Therapeutic uses:**
   Sothahara, Vedana Sthapan, Vrana Shodhana, Deepan

3. **Nisha**

   Botanical name: *Curcuma longa*
   Family: *Zingiberaceae*
   Classical names:
   Sanskrit: Haridra, Nisha, Krmighna
   Hindi: Haldi
English: turmeric

Chemical Constituents:
curcuminoids (curcumin, demethoxycurcumine and
bisdemethoxycurcumin)

Pharmacological Activities:
cosmeceuticals, expectorant, antiseptic,
anti-helminth, blood purifier, in leprosy, spleen
disorders, rheumatism, bronchitis, cough and cold,
insecticide, spasmylytic, hypotensive, cholera, syphilis

Therapeutic Use:
Kusthaghana, Kandughana, Lekhaniya

4. Shunthi

Botanical Name: Zingiber Officinale Roxb
Family: Zingiberaceae

Classical Names of Shunthi
Sanskrit: Shunthi, Vishva, Nagar, Vishvabhesaj,
Ushana, Katubhadra, Shringbher, Mahashadha
Hindi: Sonth

English: Ginger

Chemical constituents:
Heptane, Octane, Isovaleraldehyde, Nonanol,
Camphene, Myrecene, Limonene, Gingerol, Zingerone,
Shogaol, Dihydrogingerol (Essential Oil), 6-Ginge-
Sulphonic Acid, Gingerglycolipids A, B and C, Monoacyl-
Digalactosylglycerols (Rhizomes), Dehydrogingerdione,
Gingerdione and Gingerol (Root), Aspartic Acid,
Threonine, Serine, Glycine, Cysteine, Valine, Isoleucine,
Leucine and Arginine (Aerial Parts and Tuber).

Pharmacological Activities:
Anti-inflammatory, Hypolipidaemic, Anti-atherosclerotic,
Anti-antiulcer, Anti-platelet, Antipyretic, Cardiovascular, Antioxidant,
Antibacterial, Anti-fungal, Antitumoral, Carbonyl
Reductase Activity, Antiserotoninergic, Antihinoviral,
Hypouricemic, Analgesic, Antidepressant, hepato-protective, Hypoglycaemic, Inotropic.

Therapeutic Use:
Agnimandhaya, Pandu, Adhaman, Svasha, Udararoga,
Amavata.

5. Haritaki

Botanical Name: Terminalia chebula Retz.
Family: Combretaceae

Classical Names of Haritaki
Sanskrit: Haritaki, Abhaya, Pathaya, Kaystha, Putana,
Amrita, Hemavati, Ayvatha, Chetaki, Shreyashi, Shiva,
Vyastha, Vijaya, Jivanti, Rohini
Hindi: Harada, Harre

English: Myrobalan

Chemical constituents:
Tannins, Anthraquinones and Polyphenolic Compound.

Pharmacological Activities:
Immu-Modulatory Activity: Ethanol extracts study
confirms the immunomodulatory activity of ripe T.
Chebula fruits as evidenced by the increase in the
concentration of antioxidant enzymes, T and B cells,
the proliferation of which play important roles in
immunity. This phenomenon also enhances the
concentration of melatonin in the pineal gland as well
as the levels of cytokines.

Antioxidant Activity: Methanol Extract, water extract,
95 % ethanol extracts were used comparisons of
antioxidant activities between unfermented extracts
and fermented products are demonstrated for the first
Time. The antioxidative pattern plots revealed valuable
information and showed good correlation between
scavenging effect on DPPH radical assay and hsp-
luminol-H2O2 assay.

Therapeutic Use:
Vibanda, Aruchi, Udavarta, Gulama, Udararoga,
Arsaha, Pandu, Sotha, Jirnajavara, Visamajavara,
Parmeha, Siroroga, Kasha, Tamaka Svasha, Hridroga

6. Guduchi

Botanical Name: Tinospora cordifolia (Willd.)
Family: Menispermaceae
Classical Names of Guduchi

Sanskrit: Guduchi, Madhuparni, Amrita, Amritavallari, Chhinmaruha, Chhinodbhavaa, Vatsadani, Jeewanti, Tantrika, Soma, Somavalli, Kundali, Chakralakshanika, Dheera, Vishalya, Rasayani, Vayastha, Mandal, Devnirmita, Chhina, Chandrashaasa

Hindi: Giloy

English: Heart leaved moon seed

Chemical constituents:
Tinosporin, tinosporon, tinosporic acid, tinosporol, tinosporide, tinosporidine, columbin, chasmanthin, palmarin, berberin, giloin, giloinisin, cordifolide, Tinospiloridine, β-sitosterol, Cordifol, Hepacosanol, octacosanol, Isocolumbin, Tetrahydropalmatine, Magnolitarine,Palmatine

Pharmacological Activities:
Hypoglycaemic, CNS depressant, antibacterial, antimicrobial, antipyretic, anti-inflammatory, anti-arthritic, anti-allergic, hepatoprotective, analgesic, immunosupportive, antineoplastic, anti-diabetic, antitumour, adaptogenic, antioxidant, anti-endotoxic, hypotensive, diuretic.

Therapeutic Use:

8. Bharangi

Botanical name: Clerodendron serratum

Family: Berbaenaceae

Synonyms:
Sanskrit: Bhramanayastika, Kharashakha, Padma, Kasajith, Barboura

Hindi: Bharangi, Babhanaiti

English: Turk’s turban moon, beetle killer, blue glory

Chemical constituents:
Mannitol, β-sitosterol.

Pharmacologic activities:
Anti-bacterial, anti-fungal, anti-viral, anti-spasmodic, anti-carcinogenic, anti-pyretic and analgesic.

Therapeutic uses: Grahani, Kushth

9. Devadaru

Botanical name: Cedrus deodara (Roxb) Loud

Family name: Pinaceae

Vernacular names: Deodar, Devdara, Surdaru

Synonyms: Bhadrarad, Surahva, Kilimam

Parts used: heart wood

Chemical constituents:
“p-methylacetophenone, atlatone, sesquiterpenes, deodarin

Pharmacologic activities:
The extract showed strong “antileishmanial” activities within a dose 25-200 μg/ml culture and significant immunomodulant activities against the host cells”.
“Cedrus genus- Cytotoxic, spasmylytic immunomodulatory, antiallergic, anti-inflammatory and analgesic activities”.

**Rasapanchaka of Punarnavadi Kwath**

<table>
<thead>
<tr>
<th>SN</th>
<th>Drug</th>
<th>Rasa</th>
<th>Guna</th>
<th>Veerya</th>
<th>Vipaka</th>
<th>Doshghnata</th>
<th>Karma</th>
<th>Useful Part</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Punarnava</td>
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<td>Laghu, Ruksha</td>
<td>Ushana</td>
<td>Madhura</td>
<td>Tridoshashamka</td>
<td>Shothahara, Lekhana, Deepana, Anulomana, Rechana, Hridhaya, Raktavardhaka, Rasayana</td>
<td>Root</td>
</tr>
<tr>
<td>2.</td>
<td>Darunisha</td>
<td>Katu, Tikta</td>
<td>Laghu, Ruksha</td>
<td>Ushna</td>
<td>Katu</td>
<td>Kapha-Vatahara</td>
<td>Pacifies Vata and Kapha promotes Pitta</td>
<td>Root</td>
</tr>
<tr>
<td>3.</td>
<td>Nisha</td>
<td>Tikta, Madhur</td>
<td>Laghu, Ruksha</td>
<td>Ushna</td>
<td>Katu</td>
<td>Kapha Pitta Shamak</td>
<td>Kushtthaghana, Kundughana, Lekhania</td>
<td>Rhizome</td>
</tr>
<tr>
<td>4.</td>
<td>Sunthi</td>
<td>Katu</td>
<td>Laghu, Snigdha</td>
<td>Ushana</td>
<td>Madhura</td>
<td>Vata Kaphahara</td>
<td>Deepana, Pachana, Anulomana, Vatakaphahara, Hridaya</td>
<td>Fruit</td>
</tr>
<tr>
<td>5.</td>
<td>Haritaki</td>
<td>Amla, Madhura, Kasaya, Tikta, Katu</td>
<td>Ruksha, Laghu</td>
<td>Ushna</td>
<td>Madhura</td>
<td>Tridoshaghana</td>
<td>Sarvadoshaprashamana, Chakshusaya, Rasayana, Deepana, Anulomana, Hridaya, Medaya</td>
<td>Fruit</td>
</tr>
<tr>
<td>7.</td>
<td>Chitraka</td>
<td>Katu, Kashaya</td>
<td>Laghu, Ruksha</td>
<td>Ushna</td>
<td>Katu</td>
<td>Kapha-Vatahara</td>
<td>Agnideepaka, Grahi, Pachaka</td>
<td>Root</td>
</tr>
</tbody>
</table>
## CONCLUSION

Ayurveda is gaining an overwhelming response all over the world, especially in treating chronic or lifestyle disorders. Improper life style, irregular food habits, stress and workaholic attitude is now gripping the younger generation by altering the physio biological phenomenon of their body thus hampering their standards of life style causing an imbalance at cellulo molecular level and inculcating one of the chronic diseases viz. CKD.

Ayurveda paves a holistic approach regarding treatment of chronic and a life style disorder with a plentiful formulation quoted in numerous Ayurvedic classics and plays an eminent role in establishing the quality of life. Purarnavadi Kwath is one of the renowned formulations among them adapted by the Ayurvedic practitioners in their regular clinical practice for the treatment of CKD symptoms. Various researches states that the enlisted herbs of Purarnavadi Kwath, a significant formulation which respond positively to the cardinal symptoms of CKD like edema, inflammation, decrease the levels of serum urea and serum creatinine etc. as these herbs cumulatively works as an anti-inflammatory and rejuvenating the cells for management of the CKD symptoms by countering at cellulo-mechano-bio molecular level.

Ancient Ayurvedic practitioners designed an Ayurvedic formulation with synergism of these medicinal herbs, to treat all the factors related to CKD and till date this formulation holds Its quality’s efficacy and proves its effectiveness at par to the contemporary parameters.

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