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A write up on allopathic & herbal medicine for treatment of gout

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Abstract

The herbal and natural are practiced worldwide for the treatment of gouty arthritis since ancient times. Herbs and allopathic methods have been used in the treatment of different diseases. This article is scrutinizing the treatment on gouty arthritis. Gout is a type of arthritis that causes inflammation suddenly and characterized by accumulation of urate crystals. The current articles deals with therapeutic strategies and options for the treatment of gout. We carried out this write up about the introduction, signs and symptoms, risk factors, diagnosis, treatment of gout. We also confer about the mechanism of action allopathic systems of medicine with this review. In that we annexed the list of herbal plants and their chemical constituents used in the treatment of gout.

Keywords: Deepan, pachan, jatharagni, cephalic phase, gastric phase, GI Tract

1. Introduction

Gout is a type of inflammatory arthritis that is caused by the crystallization of uric acid within the joints. Acute gout is the most painful form of gout which is associated with severe joint pain, swelling, and erythema. Deposition of monosodiumurate crystals in and around of joints, cartilage, bones, tendons, bursas, or other sites. So it results in a raised serum urate concentration which leads to irreversible joint damage. The identification of monosodium urate crystals is used in the diagnosis of the disease [1]. The most important approach in the treatment of gout is the development of xanthineoxidase inhibitors, which are effective in reducing plasma and urinary urate levels and reverses the development of tophaceous deposits [2]. Purines degrade to adenosine triphosphate (ATP) which leads to the accumulation of adenosine diphosphate (ADP) and adenosine monophosphate (AMP), which further degrade to uric acid. The main clinical stages of gout are divided into asymptomatic hyperuricemia, acute gouty arthritis, inter-critical gout and chronic tophaceous gout [3]. The major risk factors for gout is increased uric acid levels which lead to renal dysfunction, cardio vascular diseases, hypertension, diabetes mellitus, cancer, obesity and hyperlipidemia [4]. Other risk factors like male sex, high purine diets (red meats, shellfish), beer and alcohol, obesity. The effect of ethanol and type of alcoholic beverage consumed has an effect on urate which can be translated into the risk for gout. It has been reported that certain non-alcoholic components that vary among these alcoholic beverages play an important role in the metabolism of urate. Ingested purines in beer may have an effect on blood uric acid levels that could increase the hyperuricemic effect of alcohol, thereby producing a higher risk for gout than liquor or wine. Eating a diet that's high in meat and seafood and high in beverages sweetened with fruit sugar promotes higher uric acid levels, which increases the risk of gout. If overweight, the body produces more uric acid, and kidneys have more difficulty in eliminating uric acid which greatly increases the risk of gout. It occurs more often in men, primarily because, women tend to have lower uric acid levels. Men are more likely to develop gout earlier usually between 30 and 50 years of age, whereas women generally develop signs and symptoms after menopause. Certain medications to reduce the risk of gout includes list of the drugs like thiazide diuretics, the low dose of aspirin, cytotoxic drugs, ethambutol, nicotinic acid, cyclosporine. Hyperuricemia, a concentration of urate in serum above the limit of solubility of this substance (≤ 7.0 mg/dl) increased uric acid production, impaired renal uric acid excretion, or a combination of these mechanisms [5]. Serum urate levels are determined by the balance of metabolic production and excretion through the gastrointestinal tract and most prominently the kidneys.

2. Allopathic medicine to treat gout

2.1 Following drugs are used to treat the gout

Allopurinol, Febuxostat, Lesinurad, pegloticase, NSAIDS

drugs, steroids, Azathiopurine, Mercaptopurine, Theophylline, Benzbromarone, Arhalofenate.

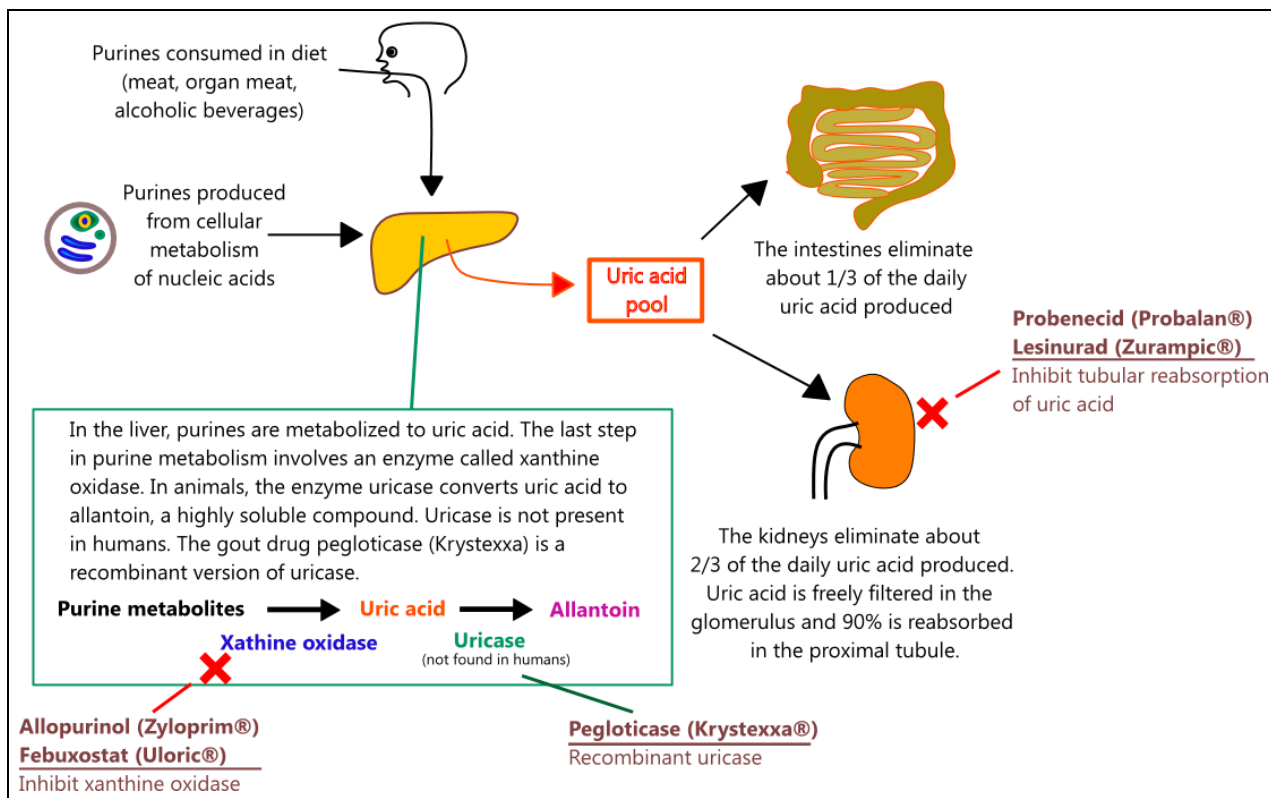


Fig 1: Therapies for gout management [6]

2.1.1 Allopurinol: Apurine-analog is widely prescribed as the dailyurate-lowering treatment (ULT) of the first choice. This drug has been proven to be effective in all cases of hyperuricemia. Because of the long half-life of the active metabolite oxypurinol (14 to 28 hours), allopurinol can be

administered once daily. It can be given as a single dose of commonly 300 mg daily and may be titrated up to a maximum of 800 mg daily if needed. In some patients, only a daily dose of 100 mg may be adequate. Mechanism of allopurinol mentioned in figure no: 2.

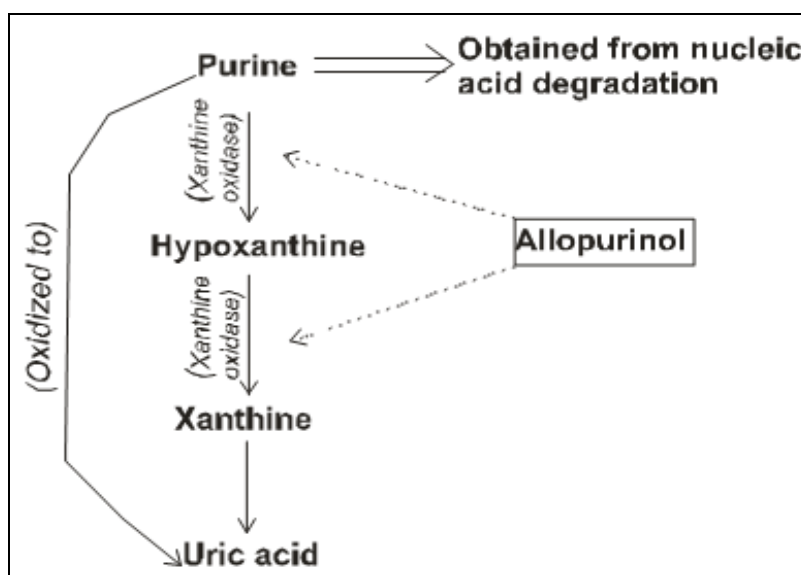


Fig 2: Mechanism of action of allopurinol [7]

Side effects: Common side effects like fever, headache, nausea, sore throat, and peeling, and red skin rash, upper stomach pain, itching, loss of appetite, weight loss, dark urine, clay-colored stools, jaundice. Pain or bleeding occurs during urinating, bruising, unusual bleeding, or purple or red pinpoint spots under the skin, Severe tingling, numbness,

pain, or muscle weakness.

1.2 Febuxostat

Febuxostat, a xanthine oxidase inhibitor completely inhibits the activity of xanthine oxidase (XO) enzyme by obstructing substrate binding and inhibits both oxidized and reduced

forms of xanthineoxidase (XO) [8]. Activities of other enzymes in purine and pyrimidine synthesis and metabolism at therapeutic concentrations are affected by < 4%. Febuxostat, was more effective than allopurinol at the commonly used fixed daily dose of 300 mg in lowering serum urate, the significant number of patients achieves target levels of serum uric acid(< 6 mg/dl) with febuxostat as compared to allopurinol and the uric acid decreased effect is sustained with febuxostat. No dose adjustments are required in hepatic impairment, renal impairment, or elderly patients.

Side effects: Treatment-related adverse events included nausea, vomiting, abdominal pain, abnormal liver function test results, headaches, and musculoskeletal signs and

symptoms. Most adverse events were mild to moderate in severity and most of them were seen in patients receiving a high dosage of febuxostat (120/ 240 mg/dl).

2.1.3 Lesinurad

Lesinuradis a selective uric acid reabsorption inhibitors (SURI) that inhibits the uric acid transporter URAT1 in the kidney. Enzymeis responsible for reabsorbing the majority of filtered uric acid from the renal tubular lumen. Enzymeis inhibited, a greater level of uric acid is excreted from the body, resulting in low serum uric acid levels. When combined with XOIs, the therapy results in both reducing production of uric acid increasing uric acid excretion, which helps maintain low serum uric acid.

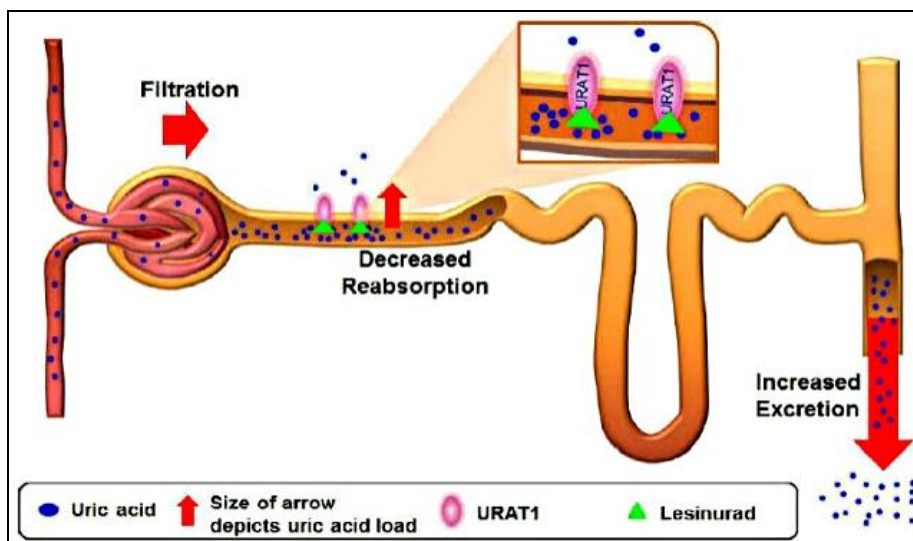


Fig 3: Mechanism of action of lesinurad

Side effects: Headache, flu, high levels of blood creatinine, heart burn [9].

2.1.4 Pegloticase

It's a PEGylated recombinant uricase enzyme converts salt of uric acid into allantoin. Pegloticase by increasing the excretion of uric acid through kidney filtration.

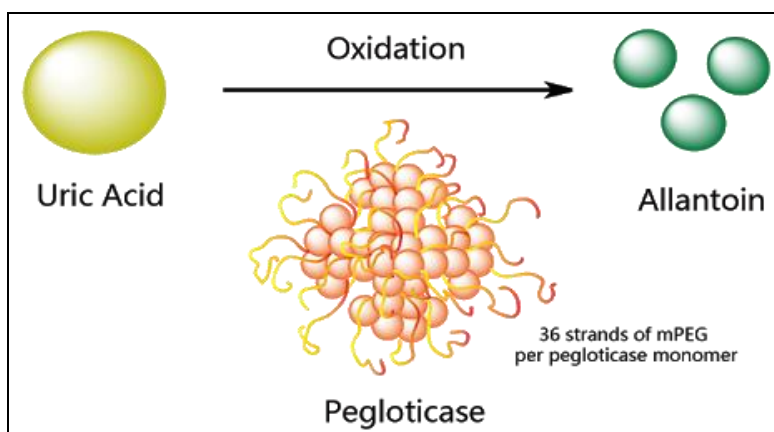


Fig 4: Mechanism of action of pegloticase

Side effects: Chest pain or discomfort, cough, difficult or labored breathing, difficulty with swallowing, dizziness, facial swelling, fast heartbeat, fever or chills, flushing or redness of the skin, gout flare, headache, hives or welts, itching, or skin rash, puffiness or swelling of the eyelids or around the eyes, face, lips, or tongue, redness of the skin,

tightness in the chest, unusual tiredness or weakness, unusually warm skin.

2.1.5 N said Drugs

Colchicines, Indomethacin, phenyl butazone, ibuprofen, probenid, sulfipyrazone, diclofenac.

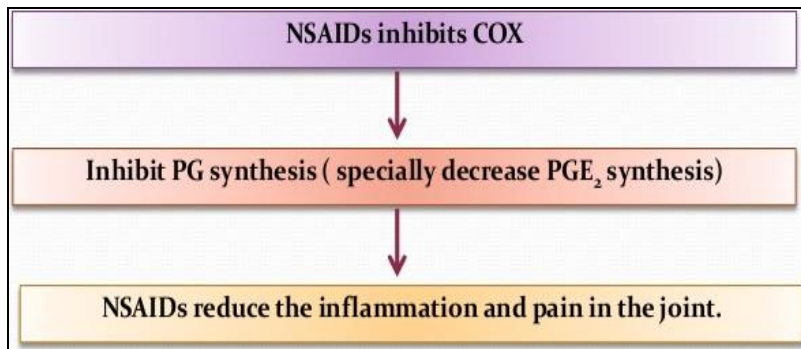


Fig 5: Mechanism of action of nsaid drugs

Colchicine

Colchicine's are mitotic inhibitors. Drug that inhibits mitosis or cell division. Colchicine modulates multiple pro-and inflammatory pathways associated with gouty arthritis. It prevents microtubule assembly and thereby disrupts inflammatory cell

chemotaxis generation of leukotrienes and cytokines, phagocytosis. Many of these cellular processes can be found in other diseases involving chronic inflammation. The mechanism of action of colchicines suggest potential efficacy of colchicines in other comorbid conditions associated with gout, such as osteoarthritis and cardiovascular diseases.

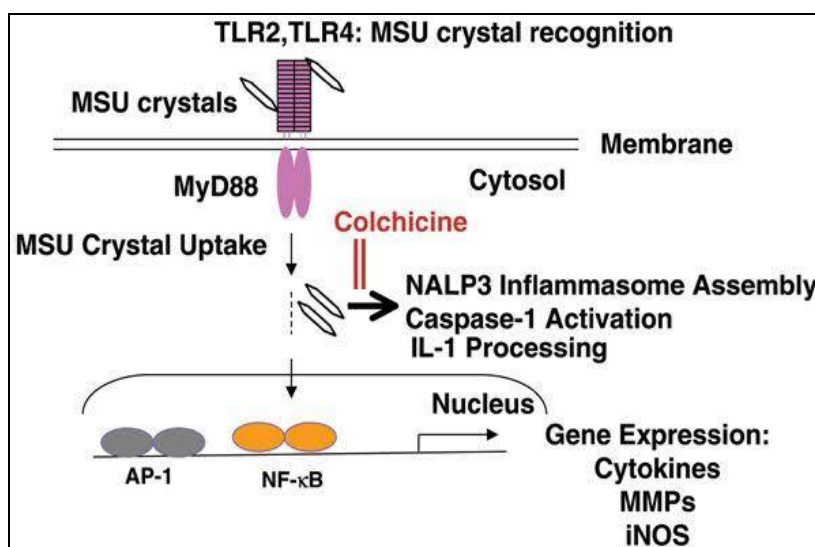


Fig 6: Mechanism of action of colchicine

Side effects: Nausea, cramping, abdominal pain and unusual bleeding, severe diarrhea or vomiting, muscle weakness or pain, numbness in your fingers or toes, pale or gray color of the lips, tongue, palms of hands. Unusual weakness or tiredness, tachycardia, dyspnea, oliguria [10].

2.1.6Corticosteroiddrugs: Inhibiting the process of inflammation and may control gout inflammation and pain. Drugs: Betamethasone, prednisone, triamcinolone, methylprednisolone, dexamethasone, steroids, that are available for use including hydrocortisone, cortisone ethamethasone, fludrocortisones, etc.

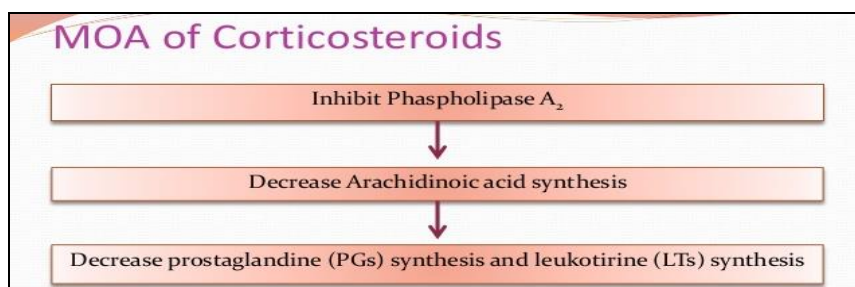


Fig 7: Mechanism action of corticosteroids drugs

3. Herbal medicine for treatment of gout

3.1 Challenges and future aspects of medicinal plants

Today medicinal plants are very important for the growth of new drugs. People are using herbal drugs because of its safety, efficacy and lesser side effects. Plants and plant products have utilized with varying success to cure and

prevent diseases. At present demand of natural plants derived products are increasing day by day in global countries. The significance of medicinal plants in national economy and its potential for the rapid growth of herbal products have been emphasizing frequently.

3.2 Plants acting on hyperuricemia: Various types of plants and its species are used in the treatment of hyperuricemia. The plants used for gout are *Acoruscalamus* (rhizome), *Adenantherapavonia* (leaves), *Alliumampeloprasum* (rhizome), *Alpiniagalanga* (leaves), *Annonamuricata* (leaves), *Annonareticulata* (leaves), *Apiumgraveolnes* (leaves), *Artemisia vulgaris* (leaves), *Averrhoacarambola* (leaves flowers, ripe fruit peels), *Baleriaprionitis* (folium), *Barrigtoniaracemosa* (leaves, endosperm, pericarp, inflorescence), *Blumeabalsamifera* (leaves), *Brassicaoleracea* (leaves), *Buteamonosperma* (roots), *Caesalpinia sappan* (wood), *Calophylluminophyllum* (leaves), *Cantellaasiatica* (whole plant), *Carica papaya* (leaves, seeds, flowers), *Cassia fistula* (leaves, seeds), *Chrysanthemum indicum* (flower), *C.sinense* (flower), *Cinnamomum cassia* (twig, bark), *C.cinnamon* (leaves), *Citrulluscolocynthisis* (seeds), *Citrus sinensis* (fruit shell), *Clinacanthusnutans* (aerial part), *Cucurbitapepo* (seeds), *Curcuma longa* (whole plant), *Cymbopogon citrates* (stalks), *Cyperusrotundus* (rhizomes), *Diamocarpuslongan* (leaves), *Erythriaindica* (bark), *E.stricta* (leaves), *Glycyrrhiza uralensis* (root), *Hedyotis diffusa* (aerial part), *Hibiscus sabdariffa* (calyx), *Justicia gendarussa* (folium), *Kaempferia galangal* (rhizome), *Kalanchoe pinnata* (aerial part), *Lantana camara* (folium), *Manikarazapota* (leaves, peels, seeds), *Melaceucalacadendra* (stem, fruit), *Mimosa pudica* (leaves, aerial parts), *Momordicacharantia* (pulp, seed), *M.citrifolia* (fruit), *M.elliptica* (leaves), *Oleauropaea* (leaves), *Orthosiphonstamineus* (leaves), *Petroselinumcrispum* (leaves), *Phaleria macrocarpa* (leaves), *Pimpinellaanisum* (leaves), *Phaseolusvulgaris* (leaves), *Piper betle* (leaves), *Plantago major* (folium, radix), *Plumbagozeylanica* (roots), *Pogostemoncablin* (leaves), *Portulacaoleracea* (leaves), *Punicagranatum* (seed), *Salacczalacca* (leaves), *Sennaalata* (leaves), *Synsepalumdulcificum* (fruit), *Tamarindusindica* (pulp, lignum), *Tetracerascandens* (root), *Trachelospermum jasminoides* (stem), *Vitex negundo* (leaves, root), *Wood fordia floribunda* (flos), *Zingiberofficinale* (rhizome) [11].

3.2.1 *Adenanthera pavonina*

Botanical Name: *Adenanthera pavonina* Linn

Family: Leguminosae

Chemical constituents: These are chemical compounds present in this plant *adenanthera pavonina* like O-acetylthanolamine, octacosanol, dulcitol, glucosides, betasitosterol, stigmaterol glucoside.

Part used: Bark, leaves, seeds.

Bark: It's used to diarrhoea, haemorrhage from the stomach, haematuria.

Leaves: This is used for Anti-inflammatory activity like rheumatic disease & gout arthritis.

Seeds: The Anticephalgic also used for the treatment of paralysis. While Treating cardiovascular diseases during pregnancy [12].

3.2.2 *Allium cepa aggregatum*

Botanical Name: *Allium cepa aggregatum*

Family: liliaceae

Chemical constituents: The Onion has been found to contain quercetin, fructose, quercetin-3-glucoside, isorhamnetin-4-glucoside, xylose, galactose, glucose, mannose, organosulfur, allylsulfides, flavonoids, flavenols, S-alk (en) ylcysteinesulfoxides, cycloalliin, selenium, thiosulfates, and sulfur, seleno.

Uses: The Onion is considered to be the reducing the risk of

stomach, brain, and liver cancer in humans and also inhibiting platelet-mediated thrombosis. It leads to heart attacks and strokes. The plant juice promotes perspiration, relieves constipation and bronchitis, induces sleep, and is good for cases of scurvy and lead colic. And also reported that reduction of blood sugar, anti-inflammatory, antihelminthic, antiseptic, carminative, antispasmodic, febrifuge, hypoglycaemic, hyperuricemia, lithontripic, hypotensive and tonic, arteriosclerosis, angina, heart attack [13, 14].

3.2.3 *Barleria prionitis*

Botanical Name: *Barleria prionitis*

Family: Acanthaceae

Chemical constituents: The plant indicated the presence of alkaloids, terpenes, flavonoids, glycosides, lignans, phenolics, saponins etc.

The leaves and flowering tops parts have been compounds were reported to highly in potassium salts. The leaves were reported to contain balarenone, pipataline, lupeol, prioni side suutell are in, melilotic acid, syringic acid, vanillic acid, p-hydroxybenzoic acid, 6-hydroxyflavones, Luteolin-7-O-β-D-glucoside, β-sitosterol, scutellarein-7-neohesperidoside, apigenin-7-O-glucoside. The aerial parts to contain barlerinoside, verbascoside, shanzhiside, methylester, barlerin, acetylbarlerin, methoxy diseroside, lupulinoside.

Uses:

Leaves: It's used for like stomach disorders, urinary infections, ulcer, fever.

Dried Stem Park: It is used to treat like cough and diaphoretic.

Aerial parts: The aerial parts help full for inflammations and gastrointestinal.

Root: The root is mainly used for urinary infection, jaundice, hepatic obstruction and dropsy.

Flowers: The flower parts is used for migraine, edema. And also used for Haemoptysis, urethral discharges, seminal disorders, and reduce obesity.

Whole plant: *Barleria prionitis* is used to stiffness of limbs, enlargement of scrotum and sciatica, bronchial asthma. Neurological disorders like paraplegia, leprosy, rheumatic infections, internal abscesses.

Crude extract: *Barleria prionitis* oil is used for arresting the graying of hair, arthritis, and gout [15].

3.2.4 *Camellia sinensis*

Botanical Name: *Camellia sinensis*

Family: Theaceae

Chemical constituents: These are chemical compounds present in this plant contain Catechins, caffeine, theobromine, gallic acid, fibre, ampelopsin, epicatechin, theanine (amino acid).

Uses: The whole plant is used for Antioxidant, antibacterial. It has also been used for cancer prevention, to lower cholesterol and to prevent delay Parkinson's disease. Catechin helps in slow down the production of particular type of enzymes in the body that is related to uric acid formation. Fibre rich diet can be helpful in reduces the uric acid level in the body [16].

3.2.5 *Caesalpinia sappan*

Botanical Name: *Caesalpinia sappan* L.

Family: Leguminosae

Chemical constituents: The Phenolic components which includes xanthone, coumarin, chalcones, flavones, homoisoflavonoids, and brazilin. The pod shell contains 4%

and bark of the plant contains tannins along with aromatic compounds such as brazilin, sappanchalcone, ceasalpin-J, caesalpin-p and protosappanin A and B.

Part used

Wood: The heartwood is used as anti-inflammatory agent for the treatment of traumatic disease and arthritis. It is used for skin rashes, burning sensations, peptic ulcers, excessive body heat, heartburn and indigestion. It also used as blood purifier and in treatment of wounds, diarrhea, epilepsy, diabetes etc. It can be used to like blood pressure, burning sensations, cancer, cataract, digestion, dysmenorrhea.

Leaves: The mainly used to cure wounds, tuberculosis, diarrhea and dysentery, antioxidative, anti-inflammatory, hepatoprotective, cytotoxic, hypoglycemic.

Seeds: It also used for stomach aches and nervous disorders [17, 18].

3.2.6 *Erythrina indica*

Botanical Name: *Erythrina indica*

Family: Leguminosae

Chemical constituents: The chemical constituents presence of alkaloids, carbohydrate, amino acids, tannins, steroids, flavonoids. It also contains several phenolic metabolites, such as pterocarpan, isoflavones, flavanones and chalcones, It also contains sterols like campesterol, β -sitosterol, β -amyrin, erythratine.

Parts used

Bark: It can be used for digestion strength and also reduces cholesterol, obesity treatment, liver disorders and fever, astringent, expectorant, rheumatism.

Leaves: This leaves help full for heal wound and sores, muscular pain cattle.

Root: It mainly represented to the antimicrobial activity, anti-plasmodial activity, anti-mycobacterial activity, and cytotoxic activity against various cancer cell lines [19, 20].

3.2.7 *Erythrina stricta*

Botanical Name: *Erythrina stricta* Roxb

Family: Fabaceae

Chemical constituents

Root: Following compounds are present in this plant root like Erythrabsysin II, erystagallin A, erythrabyssin I, 5-hydroxyphosphorane, sandwicensin, sophoradiol, soyasapogenol, 8-oxoerythrinine, alkyl trans ferulates and a mixture of β -sitosterol and stigmasterol.

Flower: Flower parts contain 11-acetyl erysotrine, erythratidinone.

Parts used

Bark: It can be used to the treatment for rheumatism, asthma, leprosy, epilepsy, fever.

Flower: Flower parts mainly used to the antidote to poison

Uses: So many activity present in this plant like anti-inflammatory activity, anti cataract activity, cardio protective activity, anti-microbial activity, anti urolithic activity, anti plasmodial activity, antimycobacterial activity, anti-hyperuricemia [21, 22].

3.2.8 *Glycyrrhiza uralensis*

Botanical Name: *Glycyrrhiza uralensis*

Family: Fabaceae

Chemical constituents: The plants indicated presences of Saponins, flavonoids, coumarin, alkaloids, polysaccharides, sitosterol, and amino acids, glycyrrhetic acid.

Root: Triterpene glycoside and consists of one molecule of 18β -glycyrrhetic acid and twomolecules of glucuronic acid

(18β -glycyrrhetic acid-3-O- β -D-glucuronopyranosyl-(1 \rightarrow 2)- β -D-glucuronide).

Uses: *Glycyrrhiza uralensis* is used to the treatment of activity antiarthritic, antiallergic, antiviral, anti-hepatotoxic, anticholinergic, anti-inflammatory, anti-leukemogenic, and anticarcinogenic effects, acute and chronic liver injury, viral hepatitis, hepatic steatosis, liver fibrosis, hepatoma, viral myocarditis, and other diseases like psoriasis or prostate cancer [23].

3.2.9 *Hedyotis diffusa*

Botanical Name: *Hedyotis diffusa*

Family: Rubiaceae

Chemical constituents: These are chemical compounds presences of Triterpenes, flavonoids, anthraquinones, phenolic acids and their derivatives, sterols, alkaloids, volatile oils, polysaccharides, cyclotides, coumarins and alkaloids.

Uses: It can be used for anti-cancer, antioxidant, anti-inflammatory, anti-fibroblast, immunomodulatory, neuroprotective effects [24].

3.2.10 *Hibiscus sabdariffa*

Botanical Name: *Hibiscus sabdariffa*

Family: Malvaceae

Chemical constituents:

Organic acid: *Hibiscus sabdariffa* plants have so many chemical constituents like hydroxycitric acid, hibiscus acid, hibiscus acid glucoside, hibiscus acid 6-methyl ester.

Anthocyanins present in this plants havedelphinidin-3-sambubioside, cyanidin-3-sambubioside.

In this plants present Flavonoids and phenolic acid like gallic acid, chlorogenic acid isomer I, chlorogenic acid, chlorogenic acid isomer II, 5-hydroxymethylfurfural, methyl gallate, 2-O-trans-caffeoyl-hydroxycitric acid, 5-caffeoylquinic acid, myricetin-3-arabinogalactoside, 3-caffeoylquinic acid, protocatechuic acid, protocatechuic acid glucoside, coumaroylquinic acid, quercetin-3-sambioside, quercetin-3-rutinoside, 5-O-caffeoylshikimic acid, leucoside, 4-caffeoylquinic acid, caffeoylquinic acid isomer, kaempferol-3-p-coumarylglucoside, quercetin, caffeic acid, galloyl ester, feruloylquinic acid derivative, kaempferol, glucoside, quercetin derivative, tiliroside

Uses: Effects on smooth muscles, antibacterial, antifungal and antiparasitic activity, antipyretic, antinociceptive and anti-inflammatory activities, antioxidant activity, hepatoprotective activity, nephroprotective activity, renal effects, cancer-preventive activity, anti-hypertensive activity, anti-obesity activity, lactating activity, delayed puberty activity, anti-hypertensive activity, anti-anaemic activity [25, 26].

3.2.11 *Justicia gendarussa*

Botanical Name: *Justicia gendarussa*

Family: Acanthaceae

Chemical constituents: *Justicia gendarussa* leaves contains shows the presence of alkaloids, flavonoids, triterpenoid, carotenoids, phenolic compounds, sugar and starch. aromatic amine like 2-(2'-amino-benzylamino) benzyl alcohol and their respective methyl ethers, 2-amino benzyl alcohol, stigmasterol, lupeol, 16-hydroxy lupeol, β -sitosterol, aromadendrin, β -Sitosterol- β -D-glycoside, and male antifertility compound like gendarusin A and gendarusin B were also isolated from the plant, betasitosterol, lupeol, an alkaloid, friedelin and aromatic amines.

Uses: Used for treatment inflammation, bronchitis, vaginal discharges, eye diseases, dyspepsia and fever.

Leaves: It's used for treatment of chronic rheumatism, leaves oil used for eczema.

Root: Root part is used for treatment rheumatism, dysentery, jaundice.

Flower: Flowers tops used for the purpose of fumigation.

Leaves: Used for a contraceptive agent in male and female, Chewing of leaves in male reduces the sperm count and in female it postpone pregnancy [27, 28].

3.2.12 *Kaempferia galangal*

Botanical Name: *Kaempferia galangal* Linn

Family: Zingiberaceae

Chemical constituents: In this plants present compound like ethyl-cinnamate and ethyl-*p*-methoxycinnamate are found to be the most vital constituents in the dichloromethane, hexane and methanol extracts. Essential oil compound include propanoic acid, pentadecane, ethyl-*p*-methoxycinnamate. And also compound like constituents include 1,8-cineol, undecanone, isopropyl cinnamate, dicyclohexylpropanedinitrile, dipentene dioxide, 9-hydroxy, 2-nonanone, 2,7- octadiene-1-yl acetate, ethyl cyclohexyl acetate, cis-11- tetradecenyl acetate, 2-heptadecanone, 4-methyl isopulegone, camphidine, others compound like trans-octa-2, 4-dienyl acetate, 10 undecyn-1-ol, 3,7-dimethoxycoumarin, delta- 3-carene, alpha pinene, camphene, borneol, cymene, alpherpineol, alpha gurjunene, germacrenes, cadinenes, caryophyllenes, luteolin and apigenin.

Uses: *Kaempferia galangal* is used for this activity antimicrobial activity, cytotoxic and antineoplastic activity, anti-inflammatory and analgesic activity, antidiarrheal activity, Mosquito repellent and larvicidal activity, sedative activity [29].

3.2.13 *Kalanchoe pinnata*

Botanical Name: *Kalanchoe pinnata*

Family: Crassulaceae

Chemical constituents: The plant contain alkaloids, flavonoids, phenolic compounds, tannins, macro elements like, microelements (iron, zinc), vitamins(ascorbic acid, riboflavine, thiamine, niacin), 15 Syringic acid, caffeic acid, 4-hydroxy-3-methoxycinnamic acid, 4-hydroxybenzoic acid, phydroxycinnamic acid, *p*-coumaric acid, ferulic acid, protocatechuic acid and phosphoenolpyruvate isolated from aerial parts of plants. *Kalancoepinnata* plants compound have like luteolin, rutin, quercetin, astragalin. Three unusual flavonoids isolated from plant are kaempferol 3-O- α -L-rhambinopyranosyl (1 \rightarrow 2) α -L-rhamnopyranoside, quercetin 3-O- α -L-rabinopyranosyl (1 \rightarrow 2) α -L-rhamnopyranoside, 4',5-dihydroxy-3',8-dimethoxyflavone 7-O- β -D-glucopyranoside and quercetin from *kalancoepinnata*.

Uses: It mainly represented to the anthelmintic activity, wound healing activity, Immunosuppressive effect, antihypertensive activity, neuropharmacological activity, anti-inflammatory activity, cytotoxicity and antimicrobial activity, hepatoprotective activity, antinociceptive, anti-Inflammatory and antidiabetic activity, anti-ulcer activity, nephroprotective and antioxidant activity, antimicrobial activity, leishmaniasis activity, diuretic and anti-urolithiatic activity, anti-tumor activity, anti-allergic activity [30].

3.2.14 *Lantana camara*

Botanical Name: *Lantana camara*

Family: Verbenaceae

Chemical constituents: These are compounds present like essential oils, phenolic compounds, flavonoids, carbohydrates, proteins, alkaloids, glycosides, phenyl ethanol, oligosaccharides, quinine, saponins, steroids, triterpenes, and tannin.

Parts used

Leaves: It's used for treatment of rheumatism, ulcer, catarrhal infection, tetanus, malaria, cancer, chicken box, asthma, swelling, eczema, tumour, high blood pressure, bilious fever, sores, measles.

Whole plant: The mainly used for bronchitis, stomach-ache and as a vermifuge.

Lantana oil: Treatment of skin itching, as an antiseptic for wounds [31].

3.2.15 *Manilkara zapota*

Botanical Name: *Manilkara zapota*

Family: Sapotacea

Chemical constituents: These compounds contains shows the presence of carbohydrate, calcium, phosphorus, iron, thiamin, riboflavin, niacin, vitamin C, vitamin A.

Uses: *Manilkara zapota* used for diarrhea, relieve pulmonary complaints, coughs, cold, dysentery, kidney stones [32]. [33].

3.2.16 *Petroselinum crispum*

Botanical Name: *Petroselinum crispum*

Family: Apiaceae

Chemical constituents: The plants indicated presences of Flavonoids, carbohydrates, coumarins, essential oils, 1R- α -pinene, β -pinene, β -phellandrene, styrene, 3-benzodioxole, 4-methoxy-6-(2-propenyl), 1,3-benzodioxole, 4,7-dimethoxy-5-(2-propenyl).

Parts used

Leaves: It's used for treatment of antitussive, diuretic, kidney stones, hemorrhoids, gastrointestinal disorder, blurred vision, dermatitis, manage bleeding, hypertension, hyperlipidemia, hepatic disorders, diabetes, skin diseases, dysmenorrhea, prostatitis, diabetes, halitosis, anaemia, hypertension, hyperuricaemia, constipation, odontalgia [34, 35].

3.2.17 *Phaleria macrocarpa*

Botanical Name: *Phaleria macrocarpa*

Family: Thymelaceae

Chemical constituents: The plants indicated presences of Phenolic compounds, flavanones, catechins, epicatechins, soflavones, anthocyanidins, other common flavonoid groups include auronones, xanthonones, and condensed tannins, catechins and leucoanthocyanidins.

Uses: In this plant is used for treatment of cancer, haemorrhage, diabetes mellitus, allergy, liver and heart diseases, kidney disorders, blood disease, rheumatism, high blood pressure, stroke, migraine, skin diseases, and acne, anti-allergenic, anti-atherogenic, anti-inflammatory, anti-microbial, antioxidant, anti-thrombotic, cardioprotective, vasodilator effects.

Stems: Stem parts used for bone cancer.

Seed: Used for breast cancer, cervix cancer, lung diseases, liver and also used to heart diseases treatments [36, 37].

3.2.18 *Vitex negundo*

Botanical Name: *Vitex negundo*

Family: Lamiaceae

Chemical constituents: These are compounds presences of contains volatile oil, triterpenes, diterpenes, sesquiterpenes, lignan, flavonoids, flavones, glycosides, stilbene derivative. δ -guaiane, guaia-3,7-dienecaryophyllene epoxide, ethyl-

hexadecenoate, α -selinene, germacren-4-ol, caryophylleneepoxide, (E)- nerolidol, β -selinene, α -cedrene, germacrene D, hexadecanoic acid, p-cymene and valencene, viridiflorol, β -caryophyllene, sabinene, 4-terpineol, γ -terpinene, caryophyllene oxide, 1-oceten-3-ol, globulol.

Uses: This is used for analgesic and anti-inflammatory, antipyretic, anti-arthritic, antimicrobial, cytotoxic, anti eosinophilic, anxiolytic, antinociceptive, anti amnesic, nephroprotective, antiestrogenic, anti-HIV, larvicidal, anti snake venom [38, 39].

4. Conclusion

The drugs of the first choice for acute gouty arthritis are nonsteroidal anti-inflammatory drugs (NSAID), corticosteroids, and treatment with xanthine oxidase inhibitors (XOI) or uricosuric drugs. New drugs approved for the treatment of gout lesinurad in combination with XOI are a new treatment option that can be considered. Nature is the best combinatorial chemist and has already diverted the attention of the people towards herbal medicines. Some medicinal plants and their chemical constituents can act as xanthineoxidase inhibitors. These plants also have safe if an appropriate amount is taken and has fewer side effects.

5. References

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