

Comparative Study of Effectiveness of Colchicum Autumnale in High Dilution and Pharmaceutical Preparation: A Review

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Abstract:- The plant is primarily used to make colchicine, which is used therapeutically to cure gout and in experiments with cellular chromosomes. In cases of familial Mediterranean fever, hepatic cirrhosis, primary biliary cirrhosis, and chronic progressive multiple sclerosis, it is utilised as adjuvant therapy. Examples of skin problems include primary amyloidosis, Behçet illness, pseudo-gout, psoriasis, Palmo-plantar pustulosis, and Dermatitis Herpetiformis.

➤ *Aims and Objective-*

The purpose of this study and summary of the literature on homoeopathic medicine's use of colchicum and colchicine.

➤ *Methodology –*

Relevant books and research articles have been extracted from different databases, including as PubMed, Google Scholar, Cochrane Library, Science direct, Theme-E-Journal of homoeopathy. Search terms were 'Colchicum & Homoeopathy, Colchicine, Pharmacology and colchicum, Action of Colchicine, Inflammation and colchicum, Alternative system of medicine, Toxicity of colchicine, Various homoeopathic materia medica books were searched and the data of colchicum Autumnale in inflammation and gout was mentioned.

➤ *Conclusion-*

This narrative review concludes that homoeopathic medicine colchicum Autumnale is effective in muscular skeletal system likes gout, joint pain, fibrous tissues etc, it continues to be a preferred medication for the management of acute gouty arthritis. It works well to treat inflammation brought on by crystals. It needs to be specified in Joint inflammatory diseases. No fatal toxicity was observed. Requirement of dose is less in colchicum Autumnale than colchicine. Overdoses on colchicine are quite uncommon. but have high mortality requiring rapid treatment.

Keywords:- Homoeopathy, Colchicum, Colchicine, Inflammation, Mechanism of Action, Pharmacokinetics , Toxicity.

I. INTRODUCTION

Colchicum originates from colchicis. Since ancient times, Gout, rheumatism, dropsy, gonorrhoea, and other conditions have all been treated using the plant and its preparations.

In the past, extracts have been used to treat cancer. The first U.S. Pharmacopoeia was published in 1820 and includes the colchicum preparation. Colchicine, a drug used to treat gout, is primarily derived from plants nowadays. It is used experimentally in cellular chromosomal research. In addition to its FDA-approved use for treating gout, colchicine has also been used to treat the following conditions: primary biliary cirrhosis, hepatic cirrhosis, familial Mediterranean fever, and as adjuvant therapy. Examples of skin problems include dermatitis herpetiformis, pseudo-gout, psoriasis, Palmo-plantar pustulosis, primary amyloidosis, and Behçet illness.

Colchicum is unquestionably a local irritant when used seriously. However, when injected into a vein, only the stomach is discovered to be inflamed; in some cases of wine or tincture poisoning, the autopsy revealed absolutely no gastro- enteric inflammation despite the patient's frequent and profuse evacuations. The kidneys are where colchicum has its strongest effects. The ability of colchicum to reduce discomfort and even shorten acute gout paroxysms is unquestionable, but the pathological condition cannot be said to be cured by colchicum. As colchicum does ease a gout paroxysm, but the alleviation is palliative rather than therapeutic. The closest counterparts to Colchicum, in my opinion, are *Actea racemosa*, *Arnica*, *Bryonia*, and *Veratrum*. Its most effective method of administration seems to be the mother-tincture and the lowest dilutions. ¹

➤ *Phytology-*

Members of the Liliaceae family, crocus plants are frequently used as are grown for their attractive, lengthy blooms. A perennial herb reaches a height of around 0.3 m. It has thick conical roots (corms) and pale purple blooms. The corm has a radish-like flavour and a bitter, caustic taste. Odour Low-lying leaves are clustered around the base of the plant and emerge from the bulb. In the spring, the plant bears leaves but no blossoms. The plant, which is native to

grassy meadows, woodlands, and riverbanks in Ireland, England, and other parts of Europe, has been cultivated all over the world.

➤ *Habitat –*

Colchicum Autumnale thrives on non-calcareous substrates in shady rocky settings, clearings in wooded areas, and moist meadows. It can be found up to 2,000 metres above sea level. produced in India. found across Europe as well. History and power: Dr. Starpf introduced it to homoeopathic medicine in 1826. Allen's Mat. Med. Encyclop. Vol. III, 248. Bulb parts are used. Fresh bulbs have 233 ml of moisture per 100 g of solids.

➤ *Preparation :*

• *Mother Tincture:*

High dose To manufacture one thousand millilitres of the Mother Tincture, combine 1/10 Colchicum Autumnale, wet magma containing solid 100g, plant moisture 233 ml, purified water 267 ml, and strong alcohol 537 ml. An updated monograph published in HPI Volume IX Homoeopathic Pharmacy of India Volume I 180.

• *Potencies:*

2x to have a tincture, three parts purified water, and six parts strong alcohol composition. 3 times and above when dispensing alcohol.

➤ *Medicinal Properties of Colchicum Autumnale –*

Colchicum, or autumn crocus Autumnale, often referred to as "meadow saffron," is a plant in the Colchicum

genus that generates colchicine, a naturally occurring substance and secondary metabolite that has the potential to be fatal. The name of the area comes from Colchis or Kochi's, an ancient Georgian state and kingdom on the eastern side of the Black Sea where plants were abundant. The meadow saffron bulb's first documented medical application dates to the first century AD. It is the most effective and well-known remedy in unani for treating joint pain, backaches, gout, and other ailments. Most Unani and Ayurvedic doctors recognise it as a conventional treatment for interior wounds. Colchicum Since Autumnale has antioxidant qualities, it is utilised to reduce internal inflammation. C. Autumnale provides unique benefits for gout. Users of C. Autumnale formulations experience a restorative deep sleep thanks to its mildly toxic effects without any addictive components. C. autumnal, a well-known pain reliever, provides relief for all kinds of musculoskeletal, joint, and digestive aches. C. autumnal soothes periosteum, synovial membranes, and burning muscle tissue. C. Autumnale is a helpful remedy for burning feet and palms. C. autumnal improves the functionality of the Genital organs. Additionally, C. autumnal has been used to increase penis size. C. autumnal is used to treat a Malignant tumour type as well as unneeded cell proliferation.

➤ *Action of Colchicum Autumnnale (Homoeopathic Preparation) -*

Whole plant contains various alkaloids which is having action on various parts of body which indicates that we can use homoeopathic preparation of colchicum Autumnnale for various disease condition.

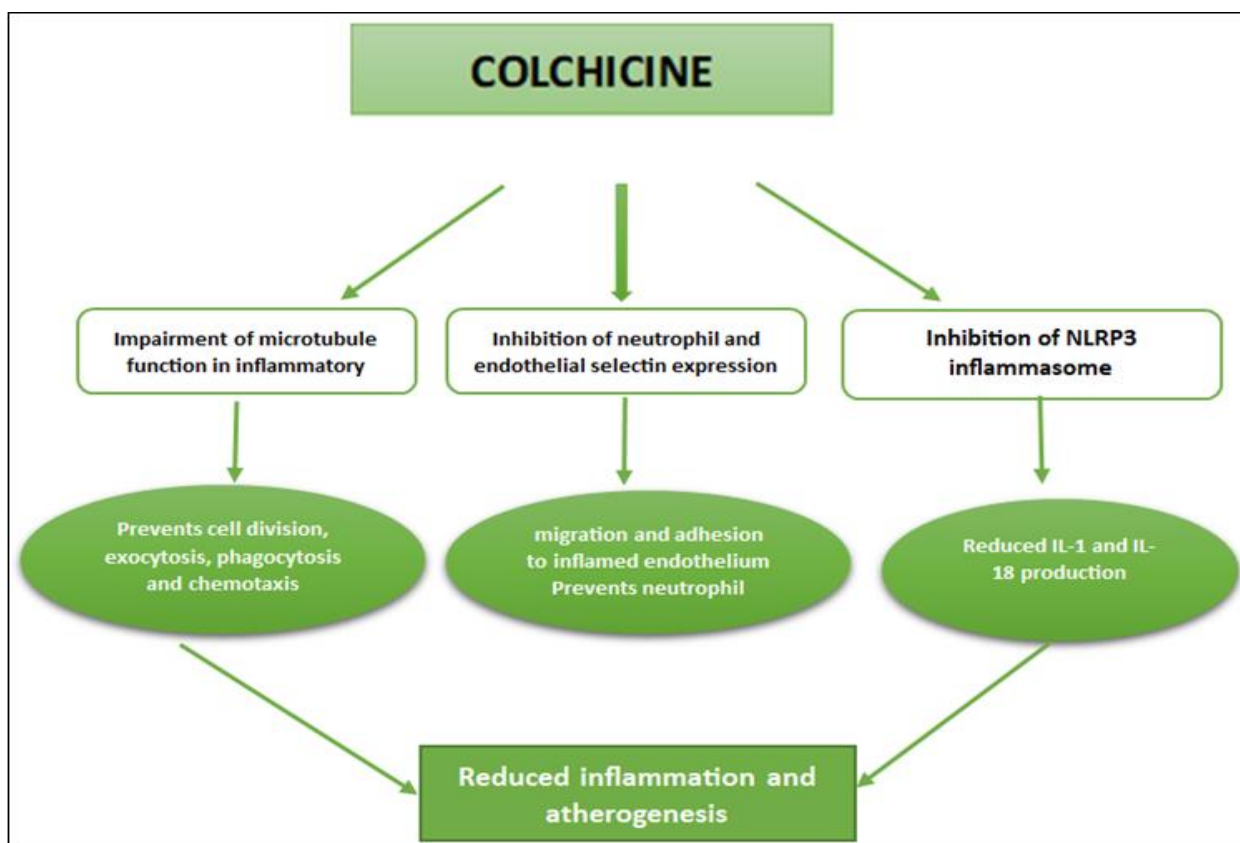


Fig 1 Pharmacological Action of Colchicine

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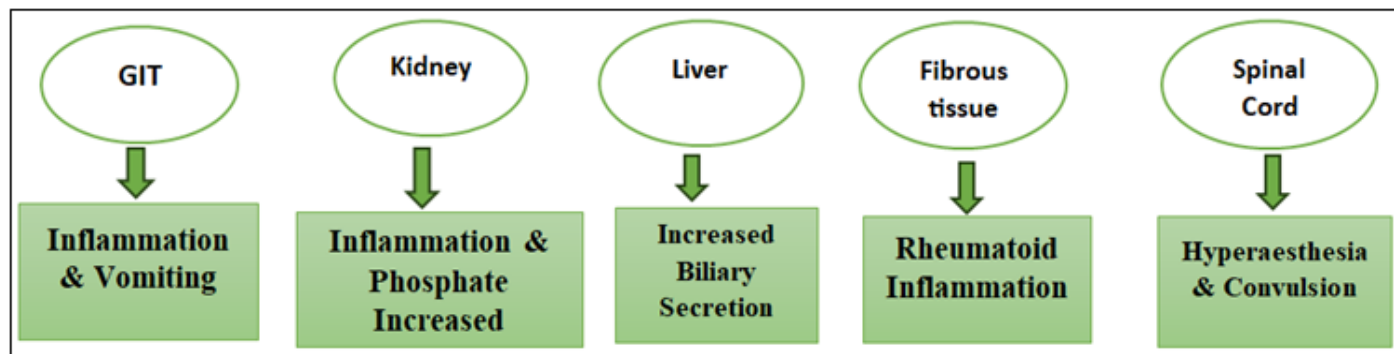


Fig 2 Action of Colchicum (Homeopathic Medicine)

Table 1 Phase of Colchicine Toxicity

PHASE	SYMPTOMS
I. 10-24 Hours	Nausea, Vomiting, Diarrhoea, Abdominal pain, Anorexia. Electrolyte imbalance, Hypovolemia, Peripheral Leucocytosis
II. 2-7 days	Bone marrow, Hypoplasia, Profound Leukopenia, Thrombocytopenia, Cardiac arrythmia & cardiovascular Collapse, Respiratory distress, Hypoxia, Pulmonary Oedema, ARDS, Oliguric renal failure Rhabdomyolysis Electrocyte derangements Metabolic acidosis Mental state changes Seizures Peripheral neuropathy and ascending paralysis
III. 7 th day onwards	Rebound leucocytosis Transient alopecia

II. MATERIALS AND METHODS

To identify clinical research publications, a thorough computerised literature search was done. A variety of databases, including PubMed, Google Scholar, the Cochrane Library, Science Direct, and the Theme-E-Journal of Homoeopathy, were consulted for appropriate books or research papers. "Colchicum & Homoeopathy, Colchicine, Colchicine, Pharmacology and Colchicine, Colchicine's Action, Colchicine's Inflammation, Alternative Medical Systems, Toxicity of Colchicine, A study of several homoeopathic materia medica texts turned up information about the use of colchicum Autumnnale for gout and inflammation. The items that were published exclusively in English were chosen.

III. DISCUSSION

A Study was conducted by Sarvar Boboev *et.al* According to the study's findings, a plant growing in its natural environment has a significant number of alkaloids included in its raw material. Colchicine and colchicine levels in Colchicum homoeopathic matrix tinctures were quantified by Kabaloeva (2013)

In 2007, Gribok *et al.* looked into colchicine, an alkaloid in *C. Autumnnale* leaves, stems, buds, flowers, and bulbs at various phases of vegetation. In accordance with

their findings, the alkaloid content was 0.031% in corms and 0.612% in leaves at the start of the growing season, 0.118% in corms during the phase of corm formation, 0.157% in leaves and 0.293% in stems, and 0.09% in corms and 0% in leaves at the end of the growing season. Corms also contained 0.06% in buds and 0.802% in flowers during the budding and flowering phases.²

Species of Colchicum are significant in ethnomedicine as well. The plant is used to treat rheumatism and bronchial illnesses. The herb is used as a laxative, for joint pain, and to purify the blood. In order to increase lactation, nursing mothers should consume freshly ground corms orally. For better digestion and anorexia treatment, dried powdered seeds are given orally. To cure knee discomfort, dried ground corms are combined with food and consumed orally with water. Hakims (specialists) provide a very little quantity of powder for joint discomfort, spleen and liver disorders, local oils, and other ailments. The bulb is powdered and used for liver disorders, flatulence, blood purification, and as a purgative. Gout is treated using the dried and powdered corm. The herb powder is taken orally to treat arthritis and joint discomfort. The plant extract is effective in treating liver and spleen illnesses as well as digestive and stomach issues. used as a galactagogues, a body tonic, a treatment for anorexia, to enhance digestion, to relieve knee and abdominal pain, and to treat anorexia. For stomach-aches, constipation, gynaecological issues,

rheumatism, gout, fever, dandruff, liver issues, rheumatoid arthritis, skin conditions, spleen issues, and cough.²

The authors of the study are Nevin Ankaya *et al.* The autumn crocus, *Colchicum Autumnale* also contains the antifungal colchicine alkaloid. Colchicine is abundant in the tuber of this plant. This study extracted colchicine from *Colchicum Autumnale* L. bulbs using an ultrasound-assisted extraction (UAE) technique, which was then followed by HPLC-UV (high-performance liquid chromatography with UV detection). The Response Surface Methodology (RSM) was used to refine a range of extraction parameters in order to identify the *Colchicum Autumnale* L. bulbs with the highest colchicine yield. The effects of three crucial parameters—extraction period (20–60 min), extraction temperature (40–80 °C), and ultrasonic power (500–700W)—were examined on extraction efficiency using the Box–Behnken design (BBD) and RSM. The dependent response variable for the yield of colchicine may be represented variously, according on the variance analysis. It was discovered that an ultrasonication power of 602.4 W, an extraction time of 42 min, and an extraction temperature of 64 °C were the optimal theoretical extraction parameters. The ideal yield under these circumstances was predicted to be 0.237%. Under ideal conditions, it was observed that the experimental colchicine yield was 0.238%. These concepts mesh quite well together.³

A Study was conducted by Stephen W Borro *et al.* In the research, the extremely rare illness known as colchicine poisoning has a significant morbidity and fatality rate. Colchicine is primarily eliminated through the enterohepatic circulation and first-order hepatic metabolism. In a case of co-ingested colchicine poisoning described by the author, the patient survived for 3 days although serum colchicine concentrations remained practically constant, showing major alterations in both metabolism and excretion. Despite the majority of the initial symptoms being benign, acute colchicine poisoning eventually developed and led to death. It seems that severe colchicine poisoning started a downward spiral of progressive organ failure and obstructed elimination. Josamycin, one of the co-ingestants and an inhibitor of P-glycoprotein, the membrane pump responsible for the clearance of colchicine, may have severely hindered colchicine's cellular and biliary clearance. Concurrent use of opioid and anticholinergic medications may have had an impact on the absorption and gastrointestinal transit of colchicine. This illustration serves as a reminder of the significance of considering concomitant drugs, early aggressive therapy, and immunotherapy consideration, if available.⁴

Nithya T *et al.* *Colchicum Autumnale* homoeopathic preparations' ability to decrease cholesterol is the subject of an *in vitro* study, for which eight sections of blood from a patient with Hyperlipidemia were employed. Colchicine was tested in six different potencies, and two controls one negative and one positive were used. Cholesterol was measured using spectrophotometry and the Liberman Burchard reagent. The reduction in cholesterol levels in the hyperlipidaemic blood sample used by the author ranged

from 18.20% to 19.16%. The following potencies successfully removed cholesterol from the body: 6C removed 18.24%, 12C removed 18.50%, 30C removed 19.02%, 200C removed 19.68%, and 10M removed 19.16%. When the reduction was 19.68% at 1M potency, the impact was at its best.⁵

Philip.w.peake *et al.* conducted an *in vivo* study rat were gavaged with colchicine Liquid chromatography/mass spectrometry was used to measure the levels of colchicine in tissue, blood, and urine; Fab anti-colchicine, urinary neutrophil gelatinase-associated lipocalin (NGAL), and kidney injury molecule-1 concentrations were measured using enzyme-linked immunosorbent assays (ELISA); and creatine kinase and creatinine (Cr) concentrations were determined through enzymatic methods. The body quickly returned to equilibrium after taking colchicine, which also raised serum creatine kinase. Fab anti-colchicine also quickly returned to the blood and stayed there for 24 hours at high amounts. Colchicine and Fab anti-colchicine were both excreted in the urine after a 7.1-fold increase in serum colchicine levels was induced by Fab anti-colchicine. Colchicine builds up in the kidney, reversal of colchicine-induced diarrhoea, and an increase in urine NGAL level (from 168 48 to 477 255 ng/mmol Cr) were all linked to this. Colchicine overdoses are relatively rare, but have high mortality requiring rapid treatment.⁶

Elham Adham Foumani *et.al* study conducted with Colchicine of *Colchicum Autumnale*, traditional anti-Inflammatory Medicine, Induces Apoptosis by Activation of Apoptotic Genes and Proteins Expression in Human Breast (MCF-7) and Mouse Breast (4T1) Cell Lines. The separated colchicine greatly reduced cell multiplication in cancer cell lines, much like regular colchicine does. Colchine exhibited dose-dependent inhibition of proliferation and induction of apoptosis. By up-regulating P53, BAX, CASPASE-3, and -9 and down-regulating BCL-2, the medication altered the expression of genes linked to apoptosis, increasing the BAX/BCL-2 ratio. We demonstrated that pure conventional colchicine and isolated colchicine from *Colchicum Autumnale* modify the expression levels of many genes, exerting their anticancer effects on human (MCF-7) and mouse (4T1) breast cancer cells. These findings lead us to propose colchicine as a potential therapy and preventative option for breast cancer.⁷

Guillaume Paré *et.al* conducted research on anti-Inflammatory derivative of colchicine. Since 50% of gout patients have chronic kidney disease, which dramatically reduces the drug's clearance and raises the risk of toxicity, this is especially concerning for them. Additionally, the likelihood of contraindications owing to unfavourable medication interactions with colchicine is increased by the existence of co-morbidities. Additionally, this medication's significant gastrointestinal system toxicity is a crucial factor in patients' low compliance. Colchicine does, however, show some molecular route specificity for gout because it blocks the activation of neutrophils by monosodium urate crystals (MSU) but not by the bacterial peptide fMLF. Colchicine blocks the generation of reactive oxygen species

(ROS), IL-1, the release of CXCL8/IL-8, and the recruitment of neutrophils in response to monosodium urate crystals.⁸

Ivana Spaseva and others The target of many naturally occurring small compounds that alter microtubule dynamics, stop the cell cycle, and induce apoptosis is tubulin. One of these is colchicine, a plant alkaloid produced by *Colchicum Autumnale*. Despite producing the potent cytotoxin colchicine and expressing the target protein, *C. Autumnale* is resistant to colchicine's cytotoxic effects, and the mechanism underlying this resistance has not yet been discovered. In the current study, the molecular mechanisms producing colchicine resistance in *C. Autumnale* are investigated and compared to human tubulin. To do this, homology models for the *C. Autumnale*-tubulin heterodimer are created, and using molecular dynamics (MD) simulations and molecular mechanics Poisson-Boltzmann calculations (MM/PBSA), the binding affinity of colchicine for tubulin is determined. The colchicine-binding location in tubulin from *C. Autumnale* exhibits less amino acid alterations when compared to human tubulin, according to the author. However, these alterations significantly reduce the binding affinity of tubulin, which results in fewer conformational changes in the protein's structure. Because these minute conformational changes are inadequate to appreciably modify microtubule dynamics, it is hypothesised that *C. Autumnale* high resistance to colchicine results from this.⁹

IV. CONCLUSION

It is not advisable to use autumn crocus as medicine since the plant contains the potentially harmful alkaloid (colchicine) throughout the entire plant. The majority of nevertheless, colchicine is not now used to treat cancer due to its toxicity and various side effects (Foster and Johnson, 2006). the inclusion of *C. Autumnale* as a component of the successful herbal medicine gouticin for treating hyperuricemia. Colchicine is present in the seeds and corms during the summer, and two to three of the seeds can be fatal (Lewis and Elvin-Lewis, 2003). When provided in low, meticulously regulated dosages, the gout medication colchicine, which is still routinely used, can be an efficient analgesic and anti-inflammatory. Modern herbalists continue to utilise *C. Autumnale* extracts to treat gout attacks. Pharmaceutical colchicine preparations are less dangerous than herbal colchicine therapies, which may include drastically varying dosages of colchicine, given the risks associated with this medication. Colchicine's capacity to halt cell division presents a significant therapeutic opportunity for the treatment of cancer.

When administered therapeutically, colchicine has pleiotropic effects, with nausea and vomiting being the most often reported side effects. However, colchicine has a significant fatality rate at suprathreshold levels in addition to its limited therapeutic index. Although death typically correlates with the dose taken, a lethal dose is not accurately documented in the published reports. Gastrointestinal symptoms are the first signs of colchicine toxicity in

patients, who later develop multisystem organ failure and severe lactic acidosis. The death rate is almost 100% when multiple organ systems malfunction. The way in which colchicine works affects how deadly it is. Colchicine impacts cellular activities that need cytoskeletal remodelling by irreversibly binding to unpolymerized tubulin that is incorporated into microtubules. Cell division, blood vessel movement, and neutrophil migration are all examples of this. This report provides as an illustration of an acute colchicine poisoning event associated with a purposeful overdose. Before quickly deteriorating into refractory shock, multisystem organ failure, and circulatory collapse due to acute myocardial necrosis and biventricular function within hours, the patient originally complained of gastrointestinal complaints for 24 hours. This uncommon case of cardiovascular side effects from colchicine highlights the importance of early identification and prompt treatment.

Colchicum Autumnale, a homeopathic drug, is still a top choice for treating acute gouty arthritis since it is beneficial in treating muscular and skeletal conditions like gout, joint pain, fibrous tissues, etc. It effectively treats crystal-induced inflammation. It must be mentioned in relation to inflammatory joint illnesses. The toxicity was not lethal. *Colchicum Autumnale* has a lower dose requirement than colchicine. Colchicine overdoses are uncommon but have a significant death rate that necessitates immediate medical attention.

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