Nettle

Species (Family)
Urtica dioica L. (Urticaceae)

Synonym(s)
Stinging Nettle, Urtica

Part(s) Used
Herb

Pharmacopoeial and Other Monographs
BHC 1992 (G6)
BHP 1996 (G9)
Complete German Commission E (G3)
ESCAP 1996 and 1997 (G52)
Martindale 32nd edition (G43)
Mills and Bone (G50)
PDR for Herbal Medicines 2nd edition (G36)

Legal Category (Licensed Products)
GSL (G37)

Constituents (G6, G22, G52, G64)

Acids Carbonic, caffeic, caffeoylmalic, chlorogenic, formic, silicic, citric, fumaric, glycric, malic, oxalic, phosphoric, quinic, succinic, threonic and threono-1,4-lactone. (1)

Amines Acetylcholine, betaine, choline, lecithin, histamine, serotonin (2) and a glycoprotein. (3)

Flavonoids Flavonol glycosides (e.g. isorhamnetin, kaempferol, quercetin). (4)

Inorganics Up to 20% minerals, including calcium, potassium and silicon.

Lignans Several lignans, including (−)-secoisolariciresinol.

Other constituents Choline acetyltransferase, (5) scopoletin, (4) β-sitosterol and tannin

Other plant parts The rhizome contains lectin (Urtica dioica agglutinin) composed of six isolec-}

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inhibited the biosynthesis of arachidonic acid in vitro. An aqueous ethanol extract (0.25 mg/mL) inhibited 5-lipoxygenase-derived biosynthesis of leukotriene B₄ by 20.8% and 68.2%, respectively, and inhibited synthesis of cyclooxygenase-derived prostaglandins (IC₅₀ 92 μg/mL and 38 μg/mL, respectively). The same extract significantly reduced tumour-necrosis-factor-α (TNFα) and interleukin 1β (IL-1β) concentrations after lipopolysaccharide (LPS)-stimulated secretion of these proinflammatory cytokines in human blood. An aqueous ethanol extract (0.25 mg/mL) inhibited platelet-activating factor (PAF)-induced exocytosis of elastase from human neutrophils by 93%, but failed to inhibit biosynthesis of prostaglandins from an 80% ethanolic and an aqueous extract of nettle root (1200 mg/kg) to mice showed resistance to stimulation in the hotplate test at 55°C with a 190% increase in reaction time. Conversely, no analgesic activity was noted in the hotplate test on rats given an ethanolic extract, but the same extract did reduce the writhing response to phenylquinone after oral (1 g/kg) and intraperitoneal (500 mg/kg) treatment. The isolecitins isolated from the rhizome are reported to cause nonspecific agglutination of erythrocytes, to induce the synthesis of interferon by human lymphocytes, and have carbohydrate-binding properties.
An extract of nettle at a concentration of 1.2 mg/mL has been reported to be active against L-1210 leukaemic cells in mice.\(^{(22)}\)

**Clinical studies**

**Diuretic effect** In an open, uncontrolled study, 32 patients with myocardial or chronic venous insufficiency were treated with 15 mL of nettle juice three times daily for two weeks.\(^{(26)}\) A significant increase in daily volume of urine was observed throughout the study, the volume by day 2 being 9.2% \((p < 0.0005)\) higher than the baseline value in patients with myocardial insufficiency and 23.9% higher than the baseline value \((p < 0.0005)\) in those with chronic venous insufficiency. It has been proposed that the diuretic activity of aqueous extracts of nettle may be attributed to the high potassium content.\(^{(19)}\) The reputed diuretic effects of nettle require further investigation.

**Arthritis and rheumatism** An open, uncontrolled multicentre study involving 152 patients with various, mainly degenerative, rheumatic conditions reported that 70% of participants experienced symptom relief by the end of the three-week treatment period.\(^{(25)}\) In an open, randomised pilot study involving 37 patients with acute arthritis, diclofenac 50 mg plus stewed nettle herb 50 g was compared with diclofenac 200 mg.\(^{(23)}\) Assessment was based on the decrease in elevated acute phase C-reactive protein serum concentrations, and clinical signs of acute arthritis. Clinical improvement was observed in both groups to a similar extent. On the basis of the findings, it was suggested that nettle herb administration may enhance the effectiveness of diclofenac in rheumatic conditions. However, this requires further investigation.

Postmarketing surveillance studies involving a total of almost 2000 patients with rheumatoid arthritis treated for three weeks with nettle leaf extract (IDS-23) administered as an adjuvant to non-steroidal anti-inflammatory drugs (NSAIDs), or as monotherapy, have reported that the extract was well-tolerated.\(^{(24,25)}\)

In a randomised, double-blind, crossover study, 27 patients with osteoarthritis pain at the base of the thumb and index finger, received sting nettle leaf (applied for 30 seconds daily for one week to the painful area) or white dead nettle \((Lamium album)\) as placebo, followed by a five-week wash-out period before crossing to the other arm of the study.\(^{(26)}\) The results indicated that reductions in visual analogue scale scores for pain and in a health assessment questionnaire score for disability were significantly better for the stinging nettle group, compared with the placebo group \((p = 0.026\) and \(p = 0.0027\) for pain and disability, respectively).

**Benign prostatic hyperplasia** Clinical studies of nettle preparations in the treatment of symptoms of benign prostatic hyperplasia (BPH) have been reviewed.\(^{(20)}\) Information from this review is summarised below.

Several uncontrolled trials have reported improvements in urological symptoms, compared with baseline values, following administration of nettle root extract \((5:1)\) 600–1200 mg daily for three weeks to 20 months.\(^{(20)}\) Large observational studies involving patients with BPH who received nettle root extract for two to three months have reported improvements in various symptoms, such as urinary frequency, urinary flow and nocturia.\(^{(20)}\) These studies provide justification for further, rigorous investigation of the effects of nettle in BPH.

A placebo-controlled trial involving 79 patients with BPH assessed the effects of nettle root extract 600 mg daily for six to eight weeks. Compared with placebo, nettle root extract administration resulted in greater improvements in urinary flow and urine volume and residual volume.\(^{(20)}\) Another placebo-controlled trial of nettle root extract 600 mg daily for nine weeks in men with BPH \((n = 50)\) reported a significant decrease in SHBG concentrations and significant improvement in micturition volume and maximum urinary flow.\(^{(20)}\)

**Rhinitis** A randomised, double-blind, placebo-controlled study assessed the effects of a freeze-dried preparation of nettle herb in individuals with allergic rhinitis.\(^{(27)}\) Participants received nettle herb 600 mg, or placebo, at the onset of symptoms over a one-week period. Assessment was based on daily symptom diaries and global responses recorded at follow-up visits after one week of therapy. Nettle herb was rated more highly than placebo in the global assessment, but was rated less highly on the basis of data from the symptom diaries. It was concluded that there should be further investigation with a larger sample size and involving a longer treatment period.

**Side-effects, Toxicity**

Consumption of nettle tea has caused gastric irritation, a burning sensation of the skin, oedema and oliguria.\(^{(22)}\) The leaves are extremely irritant in view of their acetylcholine- and histamine-containing glandular hairs. An LD\(_{50}\) in mice following intraperitoneal administration of nettle has been reported as 3.625 g/kg.\(^{(12)}\) The LD\(_{50}\) for intravenous infusion of
Nettle leaf in mice has been documented as 1.92 g/kg, and the LD₅₀ for chronic administration in rats has been stated as 1.31 g/kg. An ethanolic extract of nettle (plant part unspecified) showed low toxicity in rats and mice after oral and intraperitoneal administration at doses equivalent to 2 g/kg.

Contra-indications, Warnings

In view of the documented pharmacological actions for nettle, excessive use may interact with concurrent therapy for diabetes, high or low blood pressure, and may potentiate drugs with CNS-depressant actions. Gastrointestinal irritation has been documented.

Pregnancy and lactation  Nettle is reputed to be an abortifacient and to affect the menstrual cycle. Uttero-activity has been documented in animal studies. In view of this, the use of nettle during pregnancy should be avoided. Excessive use is best avoided during lactation.

Pharmaceutical Comment

The chemistry of nettle is well documented. Limited pharmacological data are available to support the traditional herbal uses although hypoglycaemic activity in vivo has been reported. A number of clinical trials have provided some evidence to support the diuretic and anti-inflammatory effects of nettle, and for the effects of nettle in relief of symptoms of allergic rhinitis. Clinical evidence exists to support the efficacy of root extracts in the treatment of benign prostatic hyperplasia. However, further well-designed clinical trials of nettle involving large numbers of patients are required to establish the benefits. Irritant properties have been documented for nettle and excessive use should be avoided.

References

See also General References G2, G3, G5, G6, G9, G16, G22, G30, G31, G32, G36, G37, G43, G50, G52, G54, G56 and G64.

1 Bakke ILF et al. Water-soluble acids from Urtica dioica L. Medd Nor Farm Selsk 1978; 40: 181–188.
12 Riehemann K et al. Plant extracts from stinging nettle (Urtica dioica), an antirheumatic remedy, inhibit the proinflammatory transcription factor NF-κB. FEBS Lett 1999; 442: 89–94.
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