The dissolving effect of α- and β-pinenes in pine resin to kidney stone

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ABSTRACT

In folk medicine pinenes are used internally for expelling kidney stones. Terebinth is prepared using the oil filtered from oleoresin (turpentine). The homeopathic remedy is primarily used to treat problems of the kidney as well as the urethra. This homeopathic remedy was proved way back in the 19th century. Pine resin mostly contains diterpene and acids of abietic and pimaric types. α- and β-pinenes are readily absorbed through the pulmonary system, skin, and intestines. A general kidney cleanser and known to be effective with cystitis, hepatitis, prostate problems. Pinenes in volatile oils derived from plants are used widely for the treatment of renal stone disease.

Key words: Pine, α- ve β-pinene, kidney stone, dissolved effect.

INTRODUCTION

This aromatic oil comes from pine trees that are tapped for resin. The crude resin is collected and distilled to obtain oil of turpentine. The oil is useful as a topical antiseptic for rheumatic and neuralgic ailments. Internally, it is used as an expectorant for excessive mucus. A piece of pine resin, about the size of a small pea, held in the mouth, was recommended to ease bladder stricture and speed up eliminations.

Monoterpenoids are the components of essential oils, which are produced and accumulated, in large amounts by plants from certain families, including Labiatae, Pinaceae, Cupressaceae, Umbelliferae and Rutaceae.

The family Pinaceae (pine family) includes many conifers such as Cedrus, Abies, Larix, Picea, and Pinus. This plant consists of quercetin, pinene, myrcene, caryophyllene, camphene, and abietic acid. The compounds of turpentine oil from title pine species are relatively stable, and the oil content of the resin has been reported to be 15 to 19%, and varies between 9.7 to 19.3%. The contents of camphene, myrcene, limonene, β-phellandrene, γ-terpinene, terpinolene, tricyclic, sabine, and p-cymene are much smaller (Chudnyi and Rudenko, 1982; Mason, 2013; Sarwar, 2012).

Modern phytotherapy describes the following properties of the terpenic oil: antiparasitic, analgesic, revulsive, disinfectant (external use); balsamic, active on bronchial secretion and pulmonary and genito-urinary tract infections, haemostatic, dissolving gallstones, diuretic, antispasmodic, antirheumatic, deworming, being an antidote for poisonings caused by phosphorus (Valnet, 1983) and improving the ciliary and secretory activity in patients who present chronic obstructive bronchitis (internal use) (Dorow et al., 1987; El-Sakka, 2011). Terpenes, volatile components of turpentine, are emitted into the atmosphere by trees. Low-level environmental exposure to these terpenes would occur in the proximity of pine forests.

The most common terpenes in resin are the bicyclic terpenes alpha-pinene, beta-pinene, delta-3 carene and sabine, the monocyclic terpenes limonene and terpinolene, and smaller amounts of the tricyclic sesquiterpenes, longifolene, caryophyllene and delta-cadinene. Some resins also contain a high proportion of resin acids.

Pinene (C_{10}H_{16}) is a bicyclic monoterpenic chemical compound. There are two structural isomers of pinene found in nature: α-pinene and β-pinene. As the name suggests, both forms are important constituents of pine resin; they are also found in the resins of many other conifers, as well as in non-coniferous plants (Anonymous,
Turpentine is a mixture of constituents. The type and amount of specific constituents is dependent on the type of pine tree, the geographical location of the trees, and the season of tree harvest. Turpentine produced in the United States is made up primarily of α-pinene (75 to 85%) with varying amounts of β-pinene (up to 3%), camphene (4 to 15%), limonene (dipentene, 5 to 15%), 3-carene, and terpinolene.

Turpentine has a minimum alpha-pinene content of 40% by weight. Turpentine is a volatile mixture of hydrocarbon isomers obtained either from pine gum or pine wood. Gum turpentine is a yellowish, sticky, opaque, combustible material; the wood distillate (oil of turpentine) is a flammable, colorless liquid with a characteristic odor. Manufacture of synthetic pine oil; use in insecticides, beta-pinene resins, disinfectants, flavors, human and veterinary medicines, stimulating ointments, deodorizers, and perfumes. These should concentrate on the function and integrity of the kidneys. The integrity of the renal concentrating mechanism is maintained by the anatomical and functional arrangements of the renal transport mechanisms for solute (sodium, potassium, urea, etc) and water and by the function of the regulatory hormone for renal concentration. The mammalian kidneys are capable to dissociate the excretions of water and solute by varying urinary solute concentration (osmolality). Kidney stone removal can improve renal function by eradicating obstruction and, in certain cases, an underlying infection. Pinenes in herbs dissolve kidney stones and to help with urinary frequency, generally (Agaba et al., 2012; Wood et al., 2012).

RESULTS AND DISCUSSION

Rodent studies for pinenes have indicated that hydrocarbons in this chemical category participate in similar pathways of absorption, metabolism to polar oxygenated metabolites, and excretion (Quick, 1928). Terpen absorption and excretion was also investigated by Kohlert et al. (2000). The authors were able to demonstrate rapid increase of terpen plasma levels in pinenes, camphor, and limonene after dermal application in human subjects, whereas the majority of metabolites were excreted with the urine. Due to the described pharmacologic effects, terpenes were considered to have potential use in urinary tract pathology, especially in urolithiasis.

This brew is also useful for kidney and bladder afflictions. Pine stimulates, refreshes and cleanses. With a strong, fresh, resinous aroma it has a powerful antiseptic quality and is widely used. It has a deodorant affect and is often used in commercial preparations.

To adjust the thresholds for selection of filter cleaning glomerule nephrotic kidney and use a teaspoon of tincture of pine resin. The pharmacodynamic properties of the terpene combination (antilithogenic, antibacterial, anti-inflammatory, spasmolytic and analgesic effects), which
have been also confirmed in preclinical studies, represent a valuable alternative to the different drugs used in the treatment of urolithiasis (Romics et al., 2011).

Conclusion

Treatment with the terpene combination is well tolerated and safe. The terpene combination was found to be an efficacious treatment in eliminating calculi fragments generated by ESWL (extracorporeal shockwave lithotripsy) as compared to placebo. The treatment with terpenes may lead to accelerated stone expulsion. As a combination of naturally available terpenes seems to have the potential to promote and accelerate stone expulsion in primary management of urolithiasis.

REFERENCES


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