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NUTRACEUTICALS: A THERAPUTIC OVERVIEW ON YOHIMBINE

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ABSTRACT

Phytochemicals have garnered much attention because they are useful in managing several human diseases. Yohimbe is an evergreen tree that is native to western and central Africa. Yohimbine is an indole alkaloid obtained from the bark of yohimbe tree (pausinystali yohimbe) natural source. The research on yohimbine started early, and its use as a aphrodisiac, to treat erectile dysfunction, and for improved athletic performance. Although it is widely available as a supplement, there is limited evidence to support many manufacturers claims about yohimbe. The pharmacological activity of yohimbine is mediated by the combined action of the central and peripheral nervous systems. It selectively blocks the pre and postsynaptic alpha 2-adrenergic receptors and has a moderate affinity for alpha1 and alpha 2 subtypes. Bioavailability is highly variable, ranging from 7 to 87% (mean 33%). Yohimbine appears to undergo extensive metabolism in an organ of high flow such as the liver or kidney, however, the precise metabolic fate of yohimbine has not been fully determined. Elimination half-life is approximately 36 minutes. The current analysis highlights some significant findings that contribute to developing yohimbine-based drugs. It also highlights the therapeutic potential of yohimbine against selected human diseases. However, further research is recommended on the pharmacokinetics, molecular mechanisms, and drug safety requirements using well-designed randomized clinical trials to produce yohimbine as a pharmaceutical agent for human use.

Keywords: Yohimbine, Phytochemical, Indole Alkaloid, Pharmacodynamic, Alpha-2 Receptor Antagonist.

I. INTRODUCTION

- Yohimbine (yoe him' been) is a popular and widely used herbal which was traditionally used in Africa for multiple conditions including cough, fever, leprosy, heart disease and as an anesthetic, hallucinogen and aphrodisiac.
- Yohimbe is derived from the bark of the African evergreen tree Pausinystali yohimbe (synonym, P. johimbe).
- The bark extract has multiple constituents, but the focus of most interest has been yohimbine, an indole alkaloid which has been shown to be an alpha 2 adrenergic receptor antagonist.
- Its effect on sexual desire is less well defined.
- The usual recommended dose of purified yohimbine is 5 to 10 mg three times a day.
- Drug tolerance or tachyphylaxis may occur.

Isolation:

Yohimbine hydrochloride was first extracted from the bark of the *Pausinystalia yohimbe* tree, native to West Africa. Traditionally, people used this plant as a stimulant and aphrodisiac, mainly as a natural remedy for erectile dysfunction. Yohimbine has also been found in *Alchornea floribunda* Müll. Arg., *Rauvolfia vomitoria*, *Rauwolfia nitida*, *Rauwolfia serpentina*, *Rauvolfia yunnanensis*, and other plant species.

II. PROPERTIES

It is a nitrogenous organic compound.

- Chemical formula: C21H26N2O3
- Molecular weight: 354.44 g/mol
- Melting point: 288-290 degree c.
- Boiling point: 542 degree c.
- Solubility: Easily soluble in chloroform, soluble in methanol & ethanol, slightly soluble in water
- Appearance: white fine powder Sensitive: light sensitive Storage condition: keep in dark and cool place

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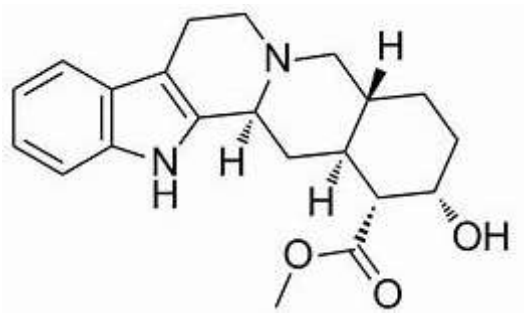

III. PHARMACODYNAMIC & MOA

- Yohimbine is an indolalkylamine alkaloid with chemical similarity to reserpine.
- Yohimbine blocks presynaptic alpha-2 adrenergic receptors.
- Yohimbine exerts a stimulating action on the mood and may increase anxiety.
- Yohimbine has a mild anti-diuretic action, probably via stimulation of hypothalmic centre and release of posterior pituitary hormone.
- Its effect on blood pressure, if any, would be to lower it; however, no adequate studies are at hand to quantitate this effect in terms of Yohimbine dosage.

Uses

weight loss: Yohimbine's ability to block the activity of alpha-2 adrenergic receptors in fat cells can help release stored fat, which may aid in weight loss

Dosages of 0.2mg/kg bodyweight have been successfully used to increase fat burning without significant implications on cardiovascular parameters like heart rate and blood pressure. This results in a dosage of: 14 mg for a 150lb person 18 mg for a 200lb person 22 mg for a 250lb person

Bodybuilding: Yohimbine's ability to increase the release of fatty acids from fat cells can also benefit bodybuilders and athletes looking to burn fat and improve muscle definition. Just like the same way yohimbine supplements reduce fat cells, they help to build muscle in the body.

Libido: Studies suggest that Yohimbine may improve sexual desire in people with sexual dysfunction. While, it is not a magic bullet and will not automatically improve sexual relationships. Other underlying issues, such as stress, low self-esteem, communication problems, and relationship conflicts, should be addressed. It's always important to consult with yohimbine may have some potential benefits a healthcare professional to determine the cause and appropriate treatment for sexual dysfunction. They can also help you evaluate the safety, efficacy, and potential drug interactions of yohimbine as a supplement

OTHER USES

- Antidepressant
- Anti-inflammatory
- Myocardial dysfunction
- Anticancer

ABSORPTION

Rapidly absorbed following oral administration. Bioavailability is highly variable, ranging from 7 to 87% (mean 33%).

METABOLISM

Yohimbine appears to undergo extensive metabolism in an organ of high flow such as the liver or kidney, however, the precise metabolic fate of yohimbine has not been fully determined.

BIOLOGICAL HALF LIFE

Elimination half-life is approximately 36 minutes.

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ADVERSE EFFECTS

- High blood pressure
- Stomachache
- Fast heart rate
- Anxiety
- Headaches
- Insomnia
- Sweating

IV. CONCLUSION

- Yohimbine's inhibitory activity on the a2-adrenergic receptor is beneficial in various disease conditions such as erectile dysfunction, myocardial dysfunction, inflammatory disorders, and cancer.
- However, few studies reported toxicological concerns after yohimbine treatment for erectile dysfunctions, albeit at comparatively higher doses.
- The potential clinical applicability of yohimbine can be assessed by investigating the relative variables and genetic factors using preclinical models followed by clinical studies.
- Well-designed randomized clinical trials are recommended to evaluate the efficacy and safety of yohimbine as a human pharmaceutical agent.
- Some studies also highlighted a synergetic therapeutic effect of yohimbine with other relevant compounds.

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