

## **ANTI-HYPERTENSIVES**

Hypertension or high blood pressure is a chronic medical condition in which the arterial blood pressure is elevated (normal blood pressure is 120/80 mm Hg). High Blood Pressure may lead to heart failure, stroke, coronary heart disease, kidney failure etc and may affect lungs, brain and heart. It is an important global problem and a very good percentage of people all over the world are affected by blood pressure. As there is no definite cure for this condition, hence controlling it is a big challenge. The main focus on BP management is to lower the elevated blood pressure and to prevent or reduce target organ damage. There are many classes of antihypertensives, which lower blood pressure by different means. Among the most important and most widely used medications are thiazide diuretics, calcium channel blockers, ACE inhibitors, **angiotensin II receptor antagonists (ARBs)**, and beta blockers.

### **Rauwolfia**

#### **Synonyms**

Sarpagandha, Chandrika; Chootachand; Indian snake root

#### **Biological Sources**

Rauwolfia consists of dried roots of *Rauwolfia serpentina* belonging to family **Apocynaceae**.

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#### **Geographical Sources**

It is an erect, evergreen, small shrub native to the Orient and occurs from India to Sumatra. It is also found in Burma, Thailand, Philippines, Vietnam, Indonesia, Malaysia, Paki-stan and Java. In India it occurs in the sub-Himalayan tracts from Sirhind eastwards to Assam, especially in Dehradun, Siwalik range, Rohelkhand, Gorakhpur ascending to 1,300 m, east and west ghats of Tamil Nadu, in Bihar (Patna and Bhagalpur), Konkan, Karnataka and Bengal

## **Cultivation and Collection**

Rauwolfia grows in tropical forests at an altitude of 1,200– 1,300 m at temperature 10–40°C. There should be enough rain or irrigation for its cultivation. The soil should be acidic (pH 4–6), clayey and manure is applied for better crop. Propagation is done by planting seeds, root cuttings or stem cuttings..The drug is collected mainly from wild plants. Roots and rhizomes are dug out in October–November when the plant roots are two to four years old. The aerial parts and roots are separated. The roots are washed and dried in air. The roots containing moisture up to 12% should be protected from light. Seasonal variation, genetic differences, geographic location, improper handling and drying, and other factors account for percentage differences in alkaloid amount. Rauwolfia should be packaged and stored in well-closed containers in a cool, dry place that is secure against insect attack.

## **Morphology.**

The roots and rhizomes are almost identical in external characters. The drug occurs in cylindrical or slightly tapering, tortuous pieces, 2–10 cm long, 5–22 mm in diameter. The roots are rarely branched. Rootlets, 0.5–1 mm in diameter, are rare. The outer surface is greyish-yellow, light-brown or brown. Young pieces contain slight wrinkles while old pieces have longitudinal ridges. Circular scars of root-lets are present. Bark exfoliation is present in old samples leaving behind patches of exposed wood. The fracture is short. A narrow, yellowish-brown bark and a dense pale yellow wood are present on the smooth transverse surface at both the ends. Pieces of rhizome closely resemble the root but may be identified by a small central pith.

## **Chemical Constituents**

Rauwolfia contains about 0.7–2.4% total alkaloidal bases from which more than 80 alkaloids have been isolated. The prominent alkaloids isolated from the drug are reserpine, rescinnamine,  $\psi$ -reserpine, rescidine, raubescine and deserpidine. The other alkaloidal components are ajmalinine, ajmaline, ajmalicine (8-yohimbine), serpentine, serpentinine, tetrahydroreserpine, raubasine, reserpinine, isoajmaline and yohambinine..

## Uses

Rauwolfia is used as hypnotic, sedative and antihypertensive. It is specific for insanity, reduces blood pressure and cures pain due to affections of the bowels. It is given in labours to increase uterine contractions and in certain neuropsychiatric disorders. Ajmaline, which has pharmacological properties similar to those of quinidine, is marketed in Japan for the treatment of cardiac arrhythmias.

Reserpine is a white or pale buff to slightly yellow, odourless, crystalline powder that darkens slowly when exposed to light and rapidly when in solution. Reserpine is an antihypertensive and tranquilizer. Rescinnamine is the methyl reserpate ester of 3,4,5-trimethoxy cinnamic acid. The usual antihypertensive dose of rescinnamine is 500 µg, two times a day. Higher doses may cause serious mental depression. Deserpidine is 11-des-methoxyreserpine. It is a wide-range tranquilizer and antihypertensive and is free from the side effects.