Saw palmetto or serenoa repens (SR) is a small palm tree native to eastern regions of the United States. Its extract is believed to be a highly effective antiandrogen as it contains phytoesterols and fatty acids as its major ingredient. SR is used in several forms of traditional herbal medicine. American Indians used the fruit for food and to treat a variety of urinary and reproductive system problems. The Mayans drank it as a tonic, and the Seminoles used the berries as an expectorant and antiseptic. Crude SR extract was used by the European and American medical practitioners for at least 200 years for various conditions, including asthma, recovery from major illness and urogenital problems. SR is currently being commercially marketed for the treatment of benign prostatic hyperplasia. Of late SR has gained popularity as a magical remedy for androgenetic alopecia (AGA). Being a naturally occurring 5 alpha reductase inhibitor, it has also been used for other dermatologic indications. This article will review the dermatologic perspective of SR.

**Mechanism of Action**

Like finasteride, SR is believed to block the enzyme 5 alpha reductase. Whether SR inhibits 5 alpha reductase 1 or both the isoenzymes of 5 alpha reductase is not clear. This action thereby blocks the conversion of testosterone to dihydrotestosterone (DHT). This is its primary mode of action for most dermatologic conditions. Other mechanisms of therapeutic benefit by SR will be elaborated under the specific conditions of its usage in dermatology.

**Dermatologic Indications of Serenoa Repens**

There is no Food and Drug Administration (FDA) approved indications of SR in dermatology. All are off-label indications.

**Androgenetic alopecia**

SR has proved to be effective in the management of AGA. Apart from the primary mechanism of action of 5 alpha-reductase blockade, SR is thought to decrease the uptake of DHT by the hair follicles and decrease its binding to androgenic receptors. Another possible effect of SR in AGA seen with its liposterolic extract is suppression of lipopolysaccharide-activated gene expression of chemokines, including CCL 17, CXCL 6, and LT B 4 associated inflammatory and apoptotic pathways. Hence, its anti-inflammatory properties are of value in AGA. With SR growth of hair is prevalently seen over the frontal and temporal regions of the scalp.

**Hirsuitism**

The safety and efficacy of SR in treating hirsuitism have not been sufficiently investigated. Studies show that it inhibits 5 alpha reductase and as a result prevents the conversion of testosterone to DHT. Further SR strongly inhibits 3 ketosteroid reductase-mediated conversion of DHT to 5-alpha androstane-3 alpha and 17 beta-diol which may...
help as therapy for hirsutism. A study done using a cream containing SR extract (Nela Depil) twice a day for 2 months in 31 women with idiopathic facial hirsutism showed a 29% decline in hair counts 2 months posttreatment which is statistically significant (P < 0.0001). However, further studies maybe required to determine the effectiveness of SR extract for this condition.

**Acne**

As SR lowers DHT levels, it influences the production of sebum by reducing the excessive oils contributing to the development of acne. SR is a dual inhibitor of cyclooxygenase and 5-lipoxygenase pathways according to in vitro research. More recently, decreased expression of COX-2 has been identified providing a further explanation for the observed anti-inflammatory activity. Further studies would only help in elucidating the efficacy of SR both as monotherapy or as a combination therapy in acne.

**Polycystic ovarian syndrome**

In polycystic ovarian syndrome, there are increased levels of adrenal androgens. Furthermore, the peripheral tissues such as skin, liver, and adipose tissue also take part in androgen synthesis by converting the weaker androgens into, the more potent ones. Androgen receptor activation takes place only with circulating testosterone and DHT. Twenty-five percent of the circulating testosterone is produced individually by the ovaries and adrenals. The remaining 50% is by the peripheral conversion from androstenedione. SR helps as an antiandrogen and may also have anti-inflammatory effects. An ethanol extract of SR inhibited the lipid droplet accumulation by attenuation of protein expressions of C-EBP alpha and PPAR gamma. Phosphorylation of Erk 1/2 and Akt 1 were also decreased by SR ethanol extract. Hence, SR extracts could selectively affect the adipocyte differentiation through the modulation of several key factors that play a critical role in adipogenesis.

**Pharmacokinetics**

As yet, there is no data available on absorption, distribution, metabolism, and elimination for SR.

**Dosage**

The dosage of SR for dermatologic indications has not been clearly established. For benign prostatic hyperplasia 160 mg twice daily of an extract standardized to contain 85%–95% fatty acids or sterols is administered. Similarly, a single daily dose of 320 mg may just be effective in this condition. As with many other herbs the quality of SR products may vary widely, owing to which a standardized dosing may pose to be a serious problem.

**Adverse Effects**

Mild stomach discomfort is the most common side effect. It can be alleviated by taking the drug after food. Hepatic inflammation is another serious problem with SR. There have been two case reports showing this adverse reaction in patients taking the medication for benign prostatic hyperplasia. Pancreatitis has been reported with SR extract. In general, some potential mechanisms for drug-induced acute pancreatitis include pancreatic duct constriction, cytotoxic and metabolic effects, accumulation of a toxic metabolite or intermediary and hypersensitivity reactions. Another theory suggests that pancreatitis may occur due to SR stimulating the estrogenic receptors and induces a hypercoaguable state that leads to pancreatic necrosis. There is one report of SR apparently causing excessive bleeding during surgery. The significance of this isolated event is not clear, but it is probably prudent to avoid SR before and just after surgery.

**Drug Interactions**

Drugs such as warfarin, heparin, aspirin, clopidogrel, and ticlopidine should be avoided in patients taking SR, owing to an increased tendency for bleeding. The exact mechanism for the increased risk of hemorrhage while taking SR with the above-mentioned drugs requires further elucidation.

**Safety in Pregnant and Nursing Women**

It has not been established till date.

**Conclusion**

SR is an herbal drug which has found to be useful in the dermatologic indications mentioned above. It has been used as a topical formulation and also systemically. Despite the easy availability of saw palmetto extract and it being designated as a food product by the US FDA there still remains paucity on its regulations with regard to efficacy and safety. Moreover, we also need to be aware of the low quality of evidence about saw palmetto extract with regard to most dermatologic indications where it has been utilized. With there being a number of side effects with the systemic route the development of more topical formulations in the near future in the form of creams, lotions, and gels could help in getting a good therapeutic outcome with the risks minimized. Finally, all patients need to be adequately counseled regarding the paucity of literature with regard to the exact mode of action, safety, and long-term effects of SR and therefore its use should be limited in those patients where there is a contraindication in the usage of other conventional modalities of management.

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**Conflicts of interest**

There are no conflicts of interest.

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