Shark Cartilage

Name of Supplement

Shark Cartilage

Scientific and Common Names

AE-941 (Neovastat®) [1-2,6 - 8], Benefin®[1], Chondroitin[3-4], Chondroitin Sulfate[3-4], Carticin[4], Cartilade[4], MSSI-1256F[1-2], Shark Cartilage Extract[1-2], Shark Cartilage Powder[1-2], and Squalus acanthias[2].

Description of Active Ingredients

Chondroitin sulfate is the major glycosaminoglycan in shark cartilage[1-3].

Mechanism of Action

Shark cartilage may exert antiangiogenic actions by suppressing new blood vessel growth required for tumor proliferation [1-3,5,6]. Clinical studies with AE-941 (Neovastat®) suggested that shark cartilage targets multiple steps in tumor neovascularization through mechanisms such as inhibiting metalloproteinase activities[1, 6,7], and competing with vascular endothelial growth factor[6, 7]. The antiangiogenic activities of shark cartilage may also treat plaque psoriasis by counteracting the actions of angiogenic cytoking interleukin 8 (IL-8)[8]. An unclear, but similar antiangiogenic actions may be involved in treating Kaposi Sarcoma[9].

Current Indications and Efficacy

Shark cartilage is currently a dietary supplement in the United States under the Dietary Supplement Health and Education Act of 1994[3].

Cancer

A relationship between dose and survival was observed in a phase II multi-center, open-label, open-ended treatment study on AE-941 (Neovastat®) in patients with refractory renal cell carcinoma; patients treated with Neovastat 240 ml/day orally twice daily had higher median survival time (16.3months) when compared with patients taking 60ml/day orally twice daily (7.1 months) [6].

Shark cartilage is not beneficial in people with advanced breast, colorectal, lung, prostate, non-Hodgkin lymphoma, and brain cancer[5].

The antiangiogenic effect of shark cartilage is currently under investigation with FDA approval by two randomized phase III trials of AE-941/Neovastat® in patients with unresectable stage IIIA or IIIB non-small cell lung cancer and renal cell carcinoma[3, 10].

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Psoriasis
Oral preparation of AE-941 (Neovastat®) containing water-soluble shark cartilage extract in a single-center, randomized, open-label, phase I/II trial found AE-941 (Neovastat®) to improve the Psoriasis Area and Severity Index (PASI) in 50%, 41.7%, and 30.8% of 49 patients with psoriasis receiving 240, 120, and 60 ml/day AE-941 (Neovastat®) respectively[8]. The severity of itching decreased as dose increased in more than 87.5% of patients[8]. Physician's global assessment of patients' response to AE-941 (Neovastat®) treatment also improved in 33% of patients receiving 30ml/day and greater than 60% in patients receiving 60, 120, and 240ml/day of AE-941 (Neovastat®)[8].

Kaposi Sarcoma (KS)
Oral preparations of shark cartilage given 3750 mg divided 2 times a day initially for 3 months and then 4500mg divided 3 times a day for 18 months was found effective in reducing KS lesion size, color, and small vessels in a 45-year-old human immunodeficiency virus-seronegative white man who was positive for human herpes virus 8 (HHV-8)[9]. No actual numbers or percentages reported.

Other
Insufficient data is available for arthritis, wound healing, enteritis, and diabetic retinopathy.

Contraindications/Allergies

Pediatrics:
Shark cartilage is contraindicated for pediatric use[10].

Hypercalcemia:
Avoid use in hypercalcemia[2].

Hypersensitivity:
Do not use in hypersensitivity to shark cartilage or chondroitin sulfate[3].

Pregnancy and lactation:
Avoid using in pregnancy and lactation (insufficient data available).

Dosage Forms, Recommended Doses, Duration

Extract
For refractory metastatic renal cell carcinoma: oral 60 to 240 milliliters per day of AE-941 (Neovastat®)[6]. For psoriasis: 60, 120, and 240ml/day of AE-941 (Neovastat®) for 12 weeks[8].

Capsule
As an antineoplastic: 80 to 100 grams per day[3]; for psoriasis: 0.4-0.5g per kilogram daily for four weeks, then 0.2-0.3 grams per kilogram for another four weeks[10]; for Kaposi's

sarcoma: 100 grams per day[3], or 3750 mg divided 2 times a day initially for 3 months and then 4500mg divided 3 times a day for 18 months[9].

Powder
As an antineoplastic: 1to 2.5 grams per kilogram divided into 2 to 3 doses and mixed with 4-6 ounces one hour before meals[10].

Note: Commercial products generally recommend 500 milligrams to 4.5 grams in 2 to 6 divided doses daily[2].

Drug Interactions and Drug-Disease Interactions

Hypercalcemia:
Concurrent use of shark cartilage and calcium may cause or exacerbate hypercalcemia[2]. Mechanism of interaction is unclear, but the high level of calcium in shark cartilage may contribute to the development of hypercalcemia.

Fruit Juice:
Acidic fruit juices can decrease shark cartilage potency over time[2]. No mechanism reported.

Other Safety Issues

Shark cartilage has been safe to use orally for more than 21 months[6]. Insufficient data is available for other uses.

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