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# Chondroprotective Potential of Fruit Extracts of Phyllanthus emblica in Osteoarthritis.

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## Abstract

There is a need for effective nutraceuticals for osteoarthritis care. The fruit of Phyllanthus emblica is used as a powerful rejuvenator in Ayurvedic medicine. This study measured the chondroprotective potential of P. emblica ('Amalaki') fruits in vitro. We used aqueous extracts of unprocessed P. emblica fruit powder (powder A), and the powder obtained after hot water extraction and drying of powder A (powder B). Chondroprotection was measured in three different assay systems. First, we tested the effects of both fruit powders on the activities of the enzymes hyaluronidase and collagenase type 2. Second, an in vitro model of cartilage degradation was set-up with explant cultures of articular knee cartilage from osteoarthritis patients. Cartilage damage was assayed by measuring glycosaminoglycan release from explants treated with/without P. emblica fruit powders. Aqueous extracts of both fruit powders significantly inhibited the activities of hyaluronidase and collagenase type 2 in vitro. Third, in the explant model of cartilage matrix damage, extracts of glucosamine sulphate and powder B (0.05 mg/ml) exhibited statistically significant, long-term chondroprotective activity in cartilage explants from 50% of the patients tested. This result is important since glucosamine sulphate is the leading nutraceutical for osteoarthritis. Powder A induced a statistically significant, short-term chondroprotective activity in cartilage explants from all of the patients tested. This is the first study to identify and quantitate new chondroprotective activities of P. emblica fruits. These data provide pilot pre-clinical evidence for the use of P. emblica fruits as a chondroprotective agent in osteoarthritis therapy.

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