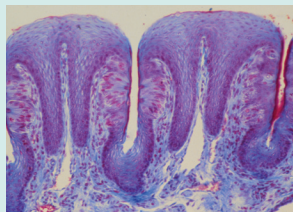


■ Online Exclusive Article

Pilot Study of “Miracle Fruit” to Improve Food Palatability for Patients Receiving Chemotherapy

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Taste changes in patients undergoing chemotherapy are common and can be of long duration, are associated with poor nutrition, and can reduce quality of life. A pilot study of the fruit *Synsepalum dulcificum*—known as “miracle fruit”—as a novel supportive intervention was conducted with eight patients with cancer who were being treated with chemotherapy and reporting taste changes. Miraculin, a naturally occurring protein in miracle fruit, has the unusual ability to transduce a sweet signal in an acidic environment, profoundly changing food taste profiles for a short duration, masking unpleasant tastes, and increasing the palatability of certain foods. This pilot study was designed to determine whether consumption of the Miracle Fruit™ supplement would improve chemotherapy-associated taste changes, thereby improving the taste of food and ultimately leading to better nutrition. Four of the participants were given a two-week supply of the supplement and the other four were given a two-week supply of a placebo. After two weeks, the supplement group received a two-week supply of the placebo and the placebo group received a two-week supply of the supplement. Participants recorded food and drink intake in daily food dairies and rated taste changes with each food as better, worse, or no change. All study participants reported positive taste changes with the supplement.

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Taste changes are common in patients with cancer; however, they are understudied, likely underestimated, and frequently impact quality of life (Comeau, Epstein, & Migas, 2001). Treatment with chemotherapy has been documented to affect alterations in taste (dysgeusia) for which no conventional therapy exists (Soares et al., 2010). Taste changes, including bitter and metallic tastes, can lead to loss of appetite, compromised nutrition, and malnutrition (Comeau et al., 2001). Taste changes from chemotherapy treatment may last a few hours or several days (Comeau et al., 2001).

Food provides comfort and flavors are one of the few constants in our lives. Research indicates that the psychological effect of altered taste in patients with cancer may be significant (Berteretche et al., 2004). These abnormal tastes can result in food aversions that, in turn, may lead to negative outcomes such as poor nutrition, a decreased response to treatment, decreased

morale, depression, and an altered quality of life (Berteretche et al., 2004).

Synsepalum dulcificum, also known as “miracle fruit,” is native to West Africa and is currently being developed in the United States as a sweetness enhancer (Wong & Kern, 2011). Miraculin, a naturally occurring protein in the fruit, has the ability to mask certain unpleasant tastes for a short duration, making some foods more palatable (i.e., acidic citrus fruit such as raw lemon) (Wong & Kern, 2011). Miraculin adheres to the taste receptors, not the food; therefore, the sweetness-enhancing effect is uniform throughout the food (Wong & Kern, 2011).

A pilot study was designed to assess whether miraculin use improves taste changes (dysgeusia). The study consisted of a convenience sample of eight participants (see Table 1), recruited from an oncology clinic in the midwestern United States, who had received three or more cycles of chemotherapy and reported taste changes to the clinic nurse. None of