

Phytochemicals in pediatric dentistry

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Phytochemicals are the basically plant chemicals in which the word 'phyto' means plant. They are bioactive non-nutrient plant compounds found in fruit, grains, vegetables and other plant foods [1]. Phytochemicals can be classified as carotenoids, alkaloids, phenolics, nitrogen containing compounds, and organosulfur compounds in which phenolics and carotenoids are most studied [2].

Among fruits phenolics content is found in apple, pineapple, cranberry, strawberry, banana, peach, orange, pear and lemon and among vegetables it is found in broccoli, red pepper, carrot, spinach, potato, lettuce, cabbage, and cucumber [3]. Carotenoid content can be found in orange, vegetables, and fruits, including carrots, sweet potato, pumpkin, papaya, and mango. Most common sources of lycopene are tomatoes, watermelons, apricots, and pink guavas [2, 4]. Presently, more believable evidences are present which suggest that the benefits of phytochemicals present in fruit and vegetables may be even greater than is currently understood because oxidative stress induced by free radicals is involved in the etiology of a extensive range of various chronic diseases [2, 5].

Phytochemicals have property of altering both apoptosis evasion and angiogenesis cell cycle control [6]. Phytochemicals have chemo preventive potential in oral carcinogenesis because of dietary compounds and bioactive constituent such as spirulina, beta-carotene, dietary flavonoids, curcumin, chalcone, black raspberries, garlic, piperine, green tea and dietary turmeric [7].

Phytochemicals can be combined with chemo preventive agents because of superior clinical applications in preventing oral cancer as they are significant in

synergizing cytotoxic drugs by both increasing their efficacy and reducing toxic effects on normal cells [6, 8]. Phytochemicals present in the fruits and vegetables are colorful which indicate their unique physiological roles [9, 10]. Antioxidant properties are present in all the colored phytochemicals that absorb light in the visible spectrum [1]. Most common dietary phytochemical is garlic. The major components of fresh garlic are carbohydrates, protein, fiber and water [11].

Dental caries is considered as global oral health problem. Proper and regular hygiene is required to prevent dental problems [12]. The natural products which are derived from plants continue to be used in treatment of dental caries [13]. Considerable evidence is present that plants extracts, and purified phytochemicals have potential to develop agents which can be used as a preventive or treatment therapies for oral diseases such as dental caries [14].

Nagini et al. has studied the chemo preventive potential of *Azadirachta indica* (neem) and turmeric because of anti lipid peroxidative and antioxidant properties which is helpful in preventing oral carcinogenesis [15].

Hsu et al. along with Chen et al. and Kato et al. concluded that green tea phenols can reduce the invasion and migration of human oral cancer cells [7]. Casto et al. studied the berry extracts and their capability to inhibit replication of human tumor cells [16]. Meng et al. conducted studies by using different fractions of garlic extracts (A to E) in treatment of buccal pouch carcinogenesis and concluded that Garlic C showed immense reduction of tumor and has antiproliferative activity [17]. Dorant et al. conducted various studies on garlic extracts in humans and concluded that garlic extract has excellent anticarcinogenic property [18]. Desai et al. and Kandil et al. concluded that garlic has natural killer cell activity which can be attained by eating (0.5 g/kg–1 daily).

Several epidemiological studies have proved that taking garlic capsules of dose 1800 mg daily for three weeks has natural killer cell activity [19, 20].

To conclude, dietary habits are most important as we consume hundreds of bioactive phytochemicals in constituents of fruits and vegetables. The additive and synergistic effects of phytochemicals present in fruits and vegetables have been projected to be responsible for their wide variety of functions.

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Deepak Viswanath – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

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The corresponding author is the guarantor of submission.

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