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Awareness about antioxidant activities of chlorogenic acid among dental students

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ABSTRACT

Chlorogenic Acid (CA) is the formation of an ester established among caffeic and quinic acid. CA contains hydroxyl based groups over an aromatic moiety and exhibits very effective anticancer, antimutational and antioxidant activities. This survey was performed for assessing the awareness about antioxidant activities of CA amongst dental students. A cross-sectional survey was performed with a pretested questionnaire with ten questions disseminated among 100 dental students. The questionnaire assessed the awareness about CA therapy, their dietary sources, medicinal uses, antioxidant activity, anti ischaemic activity and free radical scavenging effect of chlorogenic acid. The responses were recorded and analyzed. 7% were aware of dietary sources, 5% were aware of medical uses, 5% were aware of mechanisms of antioxidant activity, 4% were aware of the anti ischaemic activity, and 5% were aware of the free radical scavenging effect of chlorogenic acid. Awareness about the usage of CA therapy is very less among dental students. Increased awareness programs and sensitization programs should be conducted to improve the awareness levels.



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INTRODUCTION

Dietetic polyphenols are believed to be gainful for human wellbeing by applying different natural impacts like free-radical neutralization, chelation of metal ions, enzymatic regulation, and adjustment of signal mediated transduction pathways (Stocker, 1999). Epidemiologic examinations have indicated connections between utilization of polyphenols

enriched nourishments and counteraction of illnesses, for example, malignancy, coronary illness and osteoporosis, and aftereffects of those investigations have advanced enthusiasm for polyphenols (Kay and Holub, 2003). Polyphenols are fundamentally characterized as phenolic acids as well as flavonoids. A significant class of previous is the hydroxycinnamic acids with CA.

CA is an ester formation established among caffeic and quinic acid. CA contains hydroxyl based groups over an aromatic moiety and exhibits very effective anticancer, anti-mutational and antioxidant activities. CA undergoes hydrolyzation by intestinal microflora into different sweet-smelling metabolites, including caffeic and quinic acid (Gonthier *et al.*, 2003). It is boundless in plants, products of the soil (Clifford, 1999). Espresso beans are a significant source of CA in the diet regimen, day by day admission of CA in espresso consumers being around 1 g. (Clifford, 1999; Proteggente *et al.*, 2002; Rice-Evans *et al.*, 1996). The dietary antioxidants can improve cell resistance and help to forestall oxi-

dation harm to cell segments. This survey was performed for assessing the awareness about antioxidant activities of CA amongst dental students.

MATERIALS AND METHODS

A cross-sectional survey was performed with a pretested questionnaire with ten questions disseminated among 100 dental students. The questionnaire assessed the awareness about Chlorogenic acid therapy, their dietary sources, medicinal uses, antioxidant activity, anti ischaemic activity and free radical scavenging effect of chlorogenic acid. The responses were recorded and analyzed.

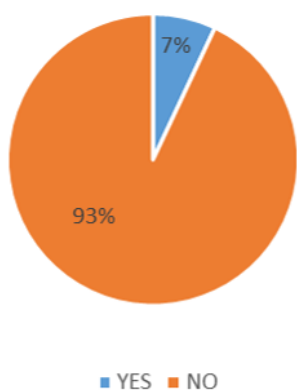


Figure 1: Awareness about dietary sources chlorogenic acid

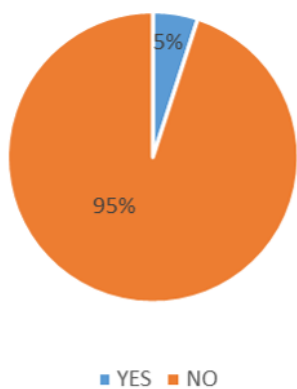


Figure 2: Awareness about medical uses of chlorogenic acid

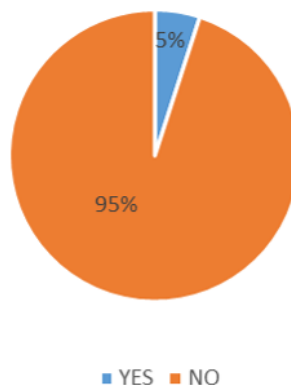


Figure 3: Awareness about mechanism of antioxidant activity of chlorogenic acid

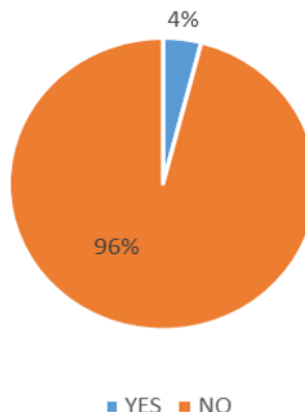


Figure 4: Awareness of anti ischaemic activity of chlorogenic acid

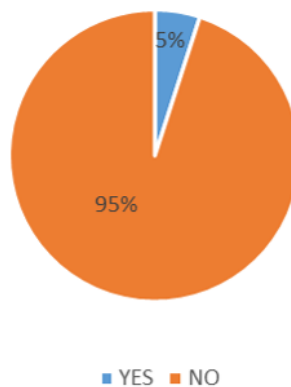


Figure 5: Awareness about free radical scavenging effect of chlorogenic acid

RESULTS

7% were aware of dietary sources of CA (Figure 1). 5% were aware of medical uses of CA (Figure 2). 5% were aware of the mechanism of antioxidant activity of CA (Figure 3). 4 % were aware of the anti

ischaemic activity of CA (Figure 4). 5% were aware of the free radical scavenging effect of CA (Figure 5).

DISCUSSION

I/R (ischemia/reperfusion) is a state that reestablishes the circulatory system after brief hypoxia. It is documented, for hypoxanthine-xanthine oxidase framework is most likely the underlying wellspring of free radical creation subsequent to hypoxia and reperfusion. Reperfusion causes oxygen inflow with the nutritive blood initiating xanthine oxidase and generates superoxide anion (Schoenberg *et al.*, 1985). In addition, the intestinal mucosa is probably the most extravagant wellspring of xanthine oxidase, and repressive action of xanthine oxidase likewise adds to the defensive impact against oxidation harm (Granger *et al.*, 1981). It is hard to quantify superoxide anions *in vivo* as a result of its receptive nature and truncated life. The MPEC test is a straightforward, reproducible and appropriately examine for estimating superoxide anion-scavenging exercises of different mixes. IC₅₀ estimations of CA and the caffeic acid were 41.0 ± 12.1 M, 10.1 ± 9.32 M respectively. The IC₅₀ estimations of different antioxidants and that of allopurinol was about 15.0 M (Takano *et al.*, 2009). Allopurinol is much of the time recommended specialist for gout and most regularly utilized xanthine oxidase inhibitor (11). These realities show that caffeic acid possesses superoxide anion-scavenging action nearly equivalent to that of allopurinol (Dupas *et al.*, 2006; Pacher *et al.*, 2006). CA undergoes hydrolyzation to caffeic acid in the alimentary system, and it is ineffectively assimilated (12). Assimilation of caffeic acid by Caco-2 cells was much reliant on the extracellular pH, but extracellular pH didn't influence CA take-up. These discoveries propose that caffeic acid assumes an increasingly significant job in defensive impacts on I/R injury. The extracellular pH in the digestive tract in the normal physiological condition is 6.0 and, hydrolyzation of the CA is a significant factor related to its defensive impact on I/R injury (Dupas *et al.*, 2006).

CONCLUSION

The awareness about the usage of chlorogenic acid therapy is very less among dental students. Increased awareness programs and sensitization programs should be conducted to improve the awareness levels.

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Conflict of Interest

The authors declare that they have no conflict of interest for this study.

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