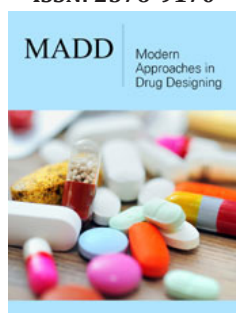


Antioxidant Enzymes Status Among Betel Quid Chewers: A Mini Review

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Introduction

One of the main driving forces are the biochemical reactions, which take place which help to sustain human life within the organelles and cells of the body. Consumption of Smokeless tobacco such as betel quid, areca nut and alcohol, which result in increased free radicals' production. Free radicals damage the cellular materials which would result in triggering or transforming normal cells into malignant ones. But, the magnitude of such damage is dependent on the body's defense mechanism, which is mediated by various cellular antioxidants. Reactive oxygen species (ROS) and free radicals are conjectured to be involved in neoplastic transformation Fiaschi AI [1]. ROS at high levels create toxicity to the cell. An imbalance between the production of ROS and the cell's oxidant capacity creates oxidative stress, which in turn may instigate or promote carcinogenesis in the cell by mutagenesis, cytotoxicity and changes in gene expression Lien et al. [2]. Slaked lime is one of the major ingredients used in betel quid beside of areca nut, catechu, and betel leaf. Aqueous extracts of areca nut and catechu were capable of generating superoxide anion and hydrogen peroxide at pH > 9.5. The areca nut-induced production of ROS was enhanced by Fe²⁺, Fe³⁺ and Cu²⁺, but inhibited by Mn²⁺. Calcium hydroxide content of slaked lime in the presence of areca nut is a major factor responsible for the formation of ROS which cause oxidative damage in the DNA of buccal mucosa cells of (Betel Quid) BQ chewers Nair et al.[3,4].

BQ chewing is constitutes an important and popular cultural activity in many Asian and Oceanic countries, including India. India has largest betel quid consuming population in the world. It is estimated that among 400 million individuals aged 15 years and above in India, 47% use smokeless tobacco in one or the other form. Superoxide dismutase (SOD) and Glutathione peroxidase (GPx) are most major enzymatic antioxidant defence system, responsible for scavenging free radicals and nascent oxygen Manoharan et al. [5]. The burst of ROS has been implicated in development of oral cancer in smokeless tobacco chewers. Antioxidant enzymes such as SOD and GPx can directly counterbalance the oxidant attack and protect the cells against DNA damage. Superoxide dismutase, a decisive antioxidant enzyme in aerobic cells; which is responsible for the elimination of superoxide radicals. An overall balance between production and removal of ROS may be more important in various cancers including OSCC (Oral squamous cell carcinoma) Yokoe et al. [6]. In our study we have screened 311 subjects from different areas of Eastern and North Eastern India and also from RKMS hospital, Kolkata, India. Out of which 61.09% had betel quid chewing habit. We found that Glutathione peroxidases values are higher in healthy control, but Super oxide dismutase values are lower in healthy control. Both data are statistically significant.

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