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TELOMERASE EXPRESSION AND ACTIVITY IN ORAL PRE-CANCER AND CANCER PATIENTS OF NORTH INDIAN POPULATION

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As a cancer population is increasing sharply, the incidence of Oral Squamous Cell Carcinoma (OSCC) has also been expected to increase. Oral carcinogenesis is a highly complex, multistep process which involves accumulation of genetic alterations that lead to the induction of proteins promoting cell growth (encoded by oncogenes) increased enzymatic (telomerase) activity promoting cancer cell proliferation. Telomerase activity has been readily found in most cancer biopsies, in premalignant lesions or in germ cells. Activity of telomerase is generally absent in normal tissues. It is known to be induced upon immortalization or malignant transformation of human cells such as in oral cancer cells. Maintenance of telomeres plays an essential role during transformation of pre-cancer to malignant stage. Mammalian telomeres, a specialized nucleoprotein structures are composed of large concatemers of the guanine-rich sequence 5-TTAGGG-3. The roles of telomeres in regulating both stability of genome and replicative immortality seems to contribute in essential ways in cancer initiation and progression. Its expression will also prove to be an important diagnostic tool as well as a novel target for cancer therapy. Telomerase is a ribonucleoprotein enzyme that synthesizes telomeres, the specialized structures containing unique simple repetitive sequences (TTAGGG in vertebrate) at the end of chromosomes. The enzyme compensates for the end replication problem and allows cells to proliferate indefinitely. The study was done to investigate the presence of telomerase activity in Oral leukoplakia (OL) and Oral Squamous Cell Carcinoma (OSCC) by TRAP assay. Telomerase activity was detectable in 18 of 20 human OSCC and 7 of 20 OL tissues. The expression of telomerase in the premalignant lesions was associated with phenotypic progression, the degree of dysplasia. Recent studies, using the TRAP assay have shown that telomerase is activated in most human cancer tissues but not in most normal tissues and tissues adjacent to malignant or benign tumors. These results indicate that telomerase is activated frequently during the late stage of oral pre-malignancy and may play a crucial role in OSCC. There are no drugs which can effect extremely to treat oral cancers. There is a general call for new emerging drugs or methods that are highly effective towards cancer treatment possess low toxicity and have a minor environment impact. Some novel natural products also offer opportunities for innovation in drug discovery. Natural compounds isolated from medicinal plants, as rich sources of novel anticancer drugs have been of increasing interest with some enzyme (telomerase) blockage property. The alarming reports of cancer cases increase the awareness amongst the clinicians and researchers pertaining to investigate newer drug with low toxicity.



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