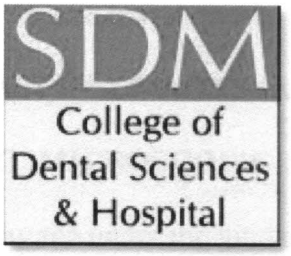

"APOPTOSIS IN ORAL EPITHELIAL DYSPLASTIC LESIONS AND ORAL SQUAMOUS CELL CARCINOMA: A LIGHT MICROSCOPIC STUDY"

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ABSTRACT

BACKGROUND & PURPOSE:

Apoptosis is a form of programmed cell death. Understanding apoptotic mechanisms and detection of its abnormalities early in the disease process can enhance the potential for early diagnosis of diseases like cancer. Apoptosis can be quantified based on morphological criteria through histological assessment, in an attempt to understand the balance between cell proliferation and death in a tumour. This study aims at evaluating apoptotic index (AI) using light microscopy as an indirect measure to assess the significance of apoptotic index as a proliferative marker in oral epithelial dysplastic lesions and malignant epithelial lesions of the oral cavity.

METHODOLOGY:

This study constituted 50 cases each of Hematoxylin and Eosin stained slides of previously diagnosed cases of oral epithelial dysplastic lesions & oral squamous cell carcinoma. In the study sample, in each section, 1000 dysplastic cells/ tumour cells were evaluated for the presence of apoptotic bodies/cells in high power fields (40x). AI was calculated as the number of apoptotic bodies/cells expressed as a percentage of the total number of non-apoptotic tumour/dysplastic cells counted in each case.

RESULTS:

There was a statistically significant increase in the apoptotic index (AI) from oral epithelial dysplasia (OED) to oral squamous cell carcinoma (OSCC) ($p=0.000$). However, no statistically significant difference was observed in values of AI between different grades of OED and between grades of OSCC. Statistically significant difference was not seen in AI between mild OED, moderate OED and severe OED

study groups (p=0.685) nor between well differentiated OSCC and moderately differentiated OSCC study groups (p=0.273).

INTERPRETATION AND CONCLUSION:

We conclude that progression of oral epithelial dysplastic lesions to OSCC is associated with an increase in AI and thus it can serve as a prognostic marker. An increase in AI was seen from mild to moderate OED which suggests a mechanism, whereby apoptosis helps to eliminate mutated cells. But as the dysplasia progressed from moderate to severe grades, the AI decreased, which suggests that as the tumour progresses to higher grades, there is impairment in the apoptotic mechanism leading to decrease in apoptosis. There was a statistically significant increase in the AI from OED to OSCC. This increase in apoptosis may be due to its role in preventing the development of aneuploidy and genetic abnormalities that are commonly associated with cancer cells and progression of neoplasia. There was an increase in AI from well differentiated OSCC to moderately differentiated OSCC. It is seen that as the tumour grows, there is increase in cell proliferation and probably due to the large tumor size and high growth rate potential, the tumour outgrows its blood supply leading to hypoxic injury causing increased apoptosis. However, there is a need to undertake studies involving larger samples, using more sensitive techniques of apoptosis detection to have a better prognostic impact.

KEYWORDS: Apoptosis, apoptotic index, oral epithelial dysplasia, oral squamous cell carcinoma, hematoxylin & eosin stain.