EFFECT OF CISPLATIN AND CURCUMIN THERAPY ON GROWTH RATE OF HEAD AND NECK SQUAMOUS CELL CARCINOMA CELL LINE: AN INVITRO STUDY

Thesis Submitted to the Faculty of Dentistry Ain Shams University in Partial Fulfillment of the Requirements for the Master Degree in Oral Pathology

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صدق الله العظيم

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ATCC: American type culture collection
BDNF: Brain-derived neurotrophic factor
CDDP: Cis-diammine dichloride platinum
COX-2: Cyclooxygenase-2
CBP: CREB- binding protein
CMN: Curcumin
DRG: dorsal root ganglia
DMSO: Di-methyl sulfoxide
EBV: epstein barr virus
E.Coli: escherichia coli
EC: endothelial cell
ELISA: Enzyme linked immunosorbant assay
FBS: foetal bovine serum
FA: fanconi anemia
G2 phase: gap 2 phase of cell cycle
HSV-1: herpes simplex virus-1
HSV-2: herpes simplex virus-2
HIV: human immunodifficiency virus
HPV: human papilloma virus
HNSCC: head and neck squamous cell carcinoma
Hep-2: human epidermoid carcinoma
iNOS: inducible nitric oxide synthase
JNK: jun N-terminal kinase
LDPI: laser Doppler perfusion imaging
LOX: Lipooxygenase
M phase: mitosis phase of cell cycle

MDR Lines: multidrug- resistant lines

MEM-H: minimum essential medium modified with hank salt

NSAIDS: non steroidal anti-inflammatory drugs

NF-κB: nuclear factor kappa B

OS: Osteosarcoma

OPN: osteopontin

PG: prostaglandin

PBS: phosphate buffer saline

PDGF: Platelet-derived growth factor

RTOG: Radiation therapy oncology group

Rb: retinoblastoma gene

ROS: reactive oxygen species

VSMF: Vascular smooth muscle cell

VEGF: vascular endothelial growth factor

VC: Vitamin c

Introduction

Squamous cell carcinoma represents more than 90% of all head and neck cancers, squamous cell carcinoma has a regional distribution involved in the biological activity of the neoplasm. Behavior of squamous cell cancer depends on its site of origin. Each anatomic site has its own particular spread pattern and prognosis. In the United States, squamous cell carcinoma of the head and neck comprises about 4% of all malignancies. This corresponds to an estimated 17 per 100,000 persons with newly diagnosed squamous cell carcinoma of the head and neck per year. Male-to-female incidence rates are greater than 3:1. The discrepancy in the male-to-female ratio is even more pronounced in laryngeal tumors, in which carcinoma is 4-5 times more common in men. This ratio has declined in the last 20 years, possibly reflecting the increased number of women using tobacco products during this period [(1)]. The number of new cases of head and neck cancers in the United States was 40,490 in 2006, accounting for about 3% of adult malignancies. 11,170 patients died of their disease in 2006 [(2)].

In certain parts of India and Southeast Asia, the practice of mixing cured tobacco with betel nuts has been associated with head and neck cancers. More than 200 million persons are thought to engage in this practice worldwide. A resultant 2.8 times higher relative risk of cancer exists for these individuals, and this increases to more than 10 times when smoking is also practiced. In these areas, the incidence of oral cancer alone is greater than 25 cases per 100,000 Persons [(1)].

Several methods for treatment of cancer of the head and neck are acceptable, including surgery, radiotherapy, chemotherapy, new molecularly targeted agents, and combinations of these. New investigative treatments include immunotherapy and gene therapy. Factors that influence the choice of treatment are the site, grade, and stage of the primary tumor, patient age, and general medical condition. Goals of treatment generally consist of removal of cancer load, maintenance of quality of life, and prevention of subsequent primary tumors [(1)].