

Effect of Apoptosis on Human Prostate Cancer Cells (PC3, DU145 AND LNCaP) Using *Curcumin longa*

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Abstract

Cancer cells usually have increased cell proliferation; have ability to survive in unique environment and decreased apoptosis. Decreased apoptosis gives the cancer cells a survival advantage. All cells showed a small base line apoptotic level. Treatment of cancer cells with curcumin significantly increased apoptosis by Caspase 3/7 assay, Annexin IV assay and tunel assay suggesting that both early and late apoptotic events are triggered by curcumin. Increased apoptosis by curcumin may be used to kill the cancer cells and thereby help in treatment of cancer. The overall results obtained in the study point out that the active molecule present in *Curcuma longa* have considerable consequence on the survival of human prostate cancer cell lines. Finally, it is concluded that curcuminoids are a group of phenolic compounds isolated from the rhizome of *Curcuma longa* has various pharmacological properties. They exhibit growth inhibitory effects on a broad range of tumors and act as potent anticancer, anti-inflammatory and analgesic agent and more research should be carried out and this data should be made accessible for both health care providers and patients for safe anticancer treatments.

Keywords - Curcumin, cancer, apoptosis, therapy.

INTRODUCTION

Curcumin is the medicinal extract of a rhizomatous herbaceous perennial plant of the ginger family, Zingiberaceae bearing many rhizomes on its root system which are the source of its culinary spice known as turmeric. The plant belongs to the genus: *Curcuma* and species: *longa*. Its scientific name is *Curcuma longa* Linnaeus and it is native in southeast India. It has gained access to many other parts of the world as an exotic variety. Curcumin (diferuloylmethane) is a polyphenol derived from the rhizome of the turmeric plant, *Curcuma longa*. It is a non-nutritive food chemical used as a flavouring, coloring agent and as a food preservative. It has been consumed for centuries as a dietary spice regularly at a reasonable amount by people in Asian countries. Modern therapist attention started to revolve round the turmeric species for its wide use in traditional medicine as a effective antioxidant, anti-inflammatory, analgesic and anticancer agent. Several pilot studies showing suppression in cellular transformation, proliferation, invasion, angiogenesis, and metastasis have further kindled their interest. Being a blood-brain barrier permeable substance exhibiting a diverse range of actions including free radical scavenging activity *in vitro* and *in vivo* with cardio and neuro-protective effects added strength to the world-wide attention.

Cancer is an abnormal growth and proliferation of cells. It is a fearsome disease because the patient suffers pain, disfigurement and loss of many physiological processes ending in fatality in most cases. The alarming facet of cancer is that it may occur at any time at any age in any part of the body. It is caused by a complex, poorly understood interplay of genetic and environmental factors. It continues to represent the largest cause of mortality in the world and kills annually about 3500 per million populations around the world. Although more anticancer drugs are in active development with many of them under clinical trials, there is a pressing necessity to develop much more efficient and less toxic drugs especially from the plant kingdom to offer a cure for cancer patients. The overall aims and objectives of the current study is to observe the following end results: Apoptosis effect of curcumin using PC3, DU145 AND LNCaP prostate cancer cell line and Caspase 3/7 assay, Annexin IV assay and Tunel assay.