

Oncology and Cancer Stem Cell 2018: Herbal drugs enhance radio toxicity of breast cancer lines with relevance to improving cancer radiotherapy - K P Mishra - Foundation for Education and Research, Mumbai, India

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Increasing incidences and mortalities of cancer have been common in the industrialized world. Breast cancer in women is one of the major diseases in both developed and developing countries. Apart from surgery and chemotherapy, radiotherapy is a most predominant treatment modality but frequently observed problems of general toxicity, exorbitant cost and non-specific action pose profound limitations in the treatment of cancer patients. While considerable technical improvement has been made in delivering the radiation to the target tissue but treatment limitations yet pose many daunting challenges. The search for new drugs for cancer treatment has been a challenging task for biomedical and pharmaceutical companies. A major predicament is faced in the cancer clinic because anticancer drugs as well as radiation kill equally both cancer and normal cells of the patients producing undesirable side effects compelling discontinuation of the treatment. Research is, therefore, warranted to develop non-toxic and affordable drugs for effective treatment of cancer patients. To meet these objectives, our laboratory has been actively attempting to develop novel drugs from plant kingdom and targeted approaches to selectively kill the cancer cells while

sparing the normal cells. The results of our studies on MCF-7 and T40D breast cancer lines have shown great promise of enhancing radiosensitivity of these cell lines to gamma radiation in vitro. A developing strategy that holds promise in treatment of cancer patients consists in searching for natural compounds which can selectively enhance tumor cell toxicity to radiation but spare normal cells as desired in clinical settings. Recent research results from our screening studies have found some potent phytochemicals from plant kingdom which display unique ability to cause no or minimal toxicity to normal cells but remarkably sensitize tumor cells to ionizing radiation. The mechanism involves the radiation generated reactive oxygen species (ROS) which trigger induction of apoptosis (cellular suicide) in tumor cells because of the high oxidative stress status in these cells. This talk is designed to present a brief highlight of our recent results based on herbal drugs for improving chemo and radiotherapy of cancer patients. A few examples of notable herbals such as triphala, ellagic acid and silibinin will be given for the observed increased tumor cytotoxicity in tumor cells by compounds from plant sources which hold promise of improving cancer radiotherapy.