Aim & Scope

Aim and Scope of the Present Investigation

Lung cancer is a serious health problem in most developed countries and its incidence rate is profusely increasing. Lung cancer is a major cause of morbidity and mortality worldwide in both men and women, accounting for 29% of all cancers. In 2016, Siegel et al. reviewed recent cancer data and they estimated a total of 239,320 new cases of lung cancer and 161,250 deaths from lung cancer in the United States in 2010.

Benzo(a)pyrene, [B(a)P] a well-known pollutant play a key role in the problem of carcinogenesis. It exhibits carcinogenic effects on laboratory animals and in humans. Benzo(a)pyrene is a chemical carcinogen, with strong carcinogenic effect on lung. It is a key component of tumour initiation process.
Primary prevention of cancer is an important counter measure against cancer there are several approaches to primary prevention of cancer, one effective way is to modify daily habit including dietary nutrients, around one third of all human cancer are related to diet and the complete avoidance of cancer causing food is difficult and the consumption of cigarette continues to grow each year, hence researcher have focused diet and therapy as the best way in cancer chemotherapy. Thus chemotherapeutic drugs plays a vital role by offering a novel approach to control the incidences of lung cancer.

The use of plant based natural product as chemotherapy agent is drawing a lot of attention and considered to be practically beneficial in certain cell/tissue based system and animal model system. Since numerous epidemiological as well as experimental studies gave positive correlation between reduced risk of cancer and intake of phytochemical. The diet rich in fruit and vegetables reduces the developing lung cancer the main responsible for the reduced risk is the strong antioxidant effect of these substances. Flavonoids like Nobiletin present in the main constituents of orange and citrus peel known to suppress carcinogenesis in various organs and has numerous beneficial effects that includes antioxidants, antiproliferative, antiperoxidative, anti inflammatory and immunomodulatory properties, it also proved to have anti tumor activity against different type of cancer. Hence in the present study, we intend to demonstrate the chemotherapeutic efficacy of Nobiletin against B(a)P induced lung cancer in swiss albino mice.

The following were the specific objectives

✓ Body weight and Tumour weight estimated in experimental groups.

✓ The activities of Tumour marker enzymes to confirm Benzo(a)Pyrene induced lung cancer.
Enzymatic and Non Enzymatic antioxidants were examined to evaluate the efficiency of Nobiletin in antioxidant defense system.

Histopathological examinations on lung tissues were carried out to confirm Benzo(a)pyrene induced changes in same groups.

Estimation of lipid peroxidation was performed to assess the free radical mediated macromolecular damage.

Activities of Mitochondrial enzymes were measured to assess the energy production and efficiency of electron transport.

Assessment of microsomal monooxygenase components like cytochrome P450, cytochrome b5 and NADPH-cytochrome c reductase were carried out and the activity of UDP-glucronyl transferase and glutathione S-transferase were also estimated to study the potentiality of detoxification system.

Histochemical analysis by toluidine blue staining in the lungs of control and experimental group of animals.

Effect of Nobiletin on immunohistochemical localization of PCNA and COX in control and experimental groups of animals

Agarose gel electrophoresis was carried out to investigate the DNA fragmentation or Apoptosis.

The mRNA expression of MMP-2, MMP-9, Cox-2 and PCNA were analysed using RT-PCR.

Expression of inflammatory proteins like MMP-2, MMP-9, Cox-2, TNF-a, p53, Bax, Bcl2, Capases-3, IL-6 and PCNA were analyzed by Western Blot techniques.