**The Protective Impact of Lycopene and Folic Acid Supplementation Against Nicotine Toxicity on Pancreatic Islets in Adult Male Albino Rats: Biochemical & Immunohistochemical Study.**

**Abstract:**

**Introduction:** It is reported that dysfunctioning of pancreatic islets and elevated levels of fasting blood glucose are found in rats when they were exposed to nicotine. Lycopene is thought to have a potential role as an effective antioxidant in the prevention of chronic diseases associated with oxidative stress. Folic acid (FA) is a water‐soluble vitamin B that is essential for amino acid metabolism.

**Aim of the study**: This study aims to explore the effects of nicotine toxicity on the pancreatic islets and the protective impact of lycopene & folic acid supplementation .

**Material and methods:** fifty healthy adult male albino rats were separated into five equal groups. Control group, Nicotine treated group at which, rats were injected intraperitoneal by nicotine 3mg/kg daily for a period of 3 weeks . Nicotine + Lycopene treated group at which rats received lycopene at a dosage of 10 mg/kg b.wt. daily in combination with nicotine treatment for 3 weeks. Nicotine + Folic acid treated group at which , rats were injected nicotine like that of group II and given Folic acid orally at a dosage of 36 µg/kg. b.wt and a recovery group at which the ratskept for one month after 3 weeks of nicotine injection. then The pancreatic tissues were examined for histopathological and immunohistochemical changes.

**Results:** The group treated with nicotine showed pancreatic islets with degeneration and ill-defined outline . Also numerous collagen fibers were present within and around the pancreatic islets in masson stained pancreatic sections . Strong INOs immunoreactivity but anti-insulin immuno expression has decreased. Lycopene and Folic acid reduces the toxic effect of nicotine on pancreatic islets, but Folic acid revealed a significant decrease in collagen fibers, INOs immunoreactivity and significant increase in anti-insulin immuno expression compared with that in Lycopene group.

**Conclusion:** The use of lycopene during the period of nicotine injection considered to have a protecting influence on pancreatic islets. Meanwhile The use of Folic acid has a more protection than Lycopene.