Histological and Immunohistochemical Analysis of Green Coffee Aqueous Extract Effect on Parotid Salivary Gland in Streptozotocin Induced Diabetic Albino Rats

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Abstract

Background: Diabetes mellitus (DM) is a very common disorder of carbohydrate metabolism whose complications affect widely the quality of life, longevity and healthcare costs. Green coffee is one of the most consumed beverages worldwide and is one of the main sources of chlorogenic acid (CGA) especially in its green form with various biological benefits.
Aim: To evaluate the possible effect of green coffee beans aqueous extract on parotid gland (PG) of streptozotocin (STZ) induced diabetic albino rats.
Material and Methods: Forty two adult male albino rats were divided equally into 3 main groups. Group I (control) rats received 0.2-0.25ml citrate buffer. This group was subdivided equally into 2 subgroups IA and IB in which rats were sacrificed corresponding to their experimental subgroups. Group II (diabetic) rats were injected by single dose of STZ (40mg/kg). Group III (diabetic treated) rats were received green coffee at a dose of 93mg/kg in form of aqueous extract 1.24-1.55ml orally once a day from the development of diabetes till the day of sacrifice. In groups II and III rats were subdivided into subgroups A and B (rats sacrificed after 1 and 2 weeks of diabetes development respectively). PGs were dissected and examined histologically and immunohistochemically.
Results: Histologically, serous acini of group II showed histological deterioration in form of pleomorphic nuclei and cytoplasmic vacuolations. In group III, serous acini showed less nuclear changes and minimal vacuolations. Immunohistochemically, PGs of group II showed diffuse cytoplasmic reactions of caspase-3 in their parenchymal elements, while the nuclear reactions were localized in group III. Statistically, area% of both anti-active caspase-3 antibody and inter-acinar spaces showed significant increase in subgroup IIB and significant decrease in subgroup IIIB.
Conclusions: Green coffee aqueous extract can enhance the deteriorative effects of diabetes on PGs in time dependent manner.

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