Biochemical studies on some sources of antioxidants

Nader Gabal Mohamed

This thesis aimed to study the effect of different natural antioxidants on hyperlipaemia in experimental animals. To achieve this goal, two main experiments were carried out using 208 male albino rats. In the first experiment, 112 rats were used in order to study the prophylactic effect of W.G.O, RM and E.P.R against hyperlipaemia. Rats were randomly divided into equal 7 groups (16 rats each). The first group of animals fed on standard normal diet and served as negative control, whereas the other rats were fed on hyperlipaemic diet rich in fat and cholesterol. One group was left to fed on this diet and served as positive control, the other groups were received the following antioxidants. W.G.O, RM, E.P.R, W.G.O + E.P.R, RM + E.P.R, respectively. The experiment lasted for 8 weeks and blood samples were withdrawn at 0 time and then after 4 and 8 weeks. Every two samples were pooled together and served as one sample.W.G.O was administered to rats in a dose equivalent to 90 mg/kg b.w and added to the diet. RM added in a dose equivalent to 550 mg/kg b.w. E.P.R at a dose of 360 mg/kg b.w.from the data obtained in this experiment, it is clearly deduced that all of the three antioxidants and their mixture had a remarkable ameliorative effect against hyperlipaemia. The effect of E.P.R was more pronounced than WGO and RM.The second experiment aimed to study the curative effect of the different natural antioxidants on the hyperlipaemic rats. In this experiment, animals were fed on the hyperlipaemic diet for 10 weeks in order to induce hyperlipidaemia. Rats were treated for 4 weeks with thedifferent antioxidants and lovastatin (2.4 mg/kg b.w/day) was used as reference standard hypolipaemic agent.A total of 96 rats were used. Animals in the first group (16 rats) were fed on the standard control diet and served as negative control. The remained animals (80 rats) were subjected to the hyperlipaemic diet for 10 weeks. One group (16 rats) was served as positive control and the other animals (64 rats) were randomly divided into equal 4 groups and received W.G.O, RM, E.P.R and lovastatin, respectively.The induction of hyperlipaemia caused a significant increase in lipid fractions e.g. total lipids, triglycerides and total cholesterol. The activity of liver enzymes (ALT, AST, ALP) were highly increased which indicate the incidence of liver dysfunction. The level of serum creatinine and urea did not altered. The antioxidant markers (SOD, MDA) were highly increased while GSH was significantly decreased.The treatment of hyperlipaemic rats with the different antioxidants caused an appreciable effect compared with the standard hypolipaemic agent ”lovastatin”. Their potency is in order E.P.R > RM > W.G.O.The antioxidant potency of W.G.O is due to the presence of a-tocopherol, phytic acid, selenium and carotins. In rosemary leaf extract, approximately 90% of the antioxidant activity has been attributed to carnosol, a phenolic diterpene, rosemarid diphenol, rosemarinic acid, carnosic acid, rosemanol, isorosemanol and epirosemanol. The antioxi-dant activity of E.P.R is due to the presence of polyunsaturated fatty acids, especially y-linoleic acid or Omega-6.The primary biological role of antioxidants is to prevent the damage that reactive free radicals can cause to cellular components.We highly recommend the use of natural antioxidant e.g. W.G.O, RM, E.P.R separately or in combinations in order to avoid the different hazards which can happened due to the presence of free radicals. Also, we highly recommend to carry out further investigations to study the effect of different types of antioxidants in normal and pathological animals in short and long period time using another species of animals e.g. rabbits, guinea pigs in order to assessment the possibility of using these antioxidants as a safe natural products at a limit does.