中山醫學大學九十八學年度博士班入學招生考試試題

營養學系博士班

考試科目：營養科學總論　　　　　　　　　時間：120 分鐘

※請注意本試題共（　1　）張，如發現頁數不足，應當場請求補齊，否則缺頁部份概以零分計算。　第（　1　）頁

本試題共三大題，總分共計 100 分。

1. For the following abstract, please answer the following questions:

Abstract: Evidence shows that there is a rapid increase in the production of markers of oxidative damage immediately following acute stroke and that endogenous antioxidant defences are rapidly depleted, thus permitting further tissue damage. Several studies point to an antioxidant effect of B-group vitamins and a pro-oxidant effect of elevated plasma tHcy (total homocysteine). We assessed whether supplementary B-group vitamins during this critical period will enhance antioxidant capacity and mitigate oxidative damage. Forty-eight patients with acute ischaemic stroke within 12 h of symptom onset were assigned to receive daily oral supplements of B-group vitamins comprising 5 mg of folate, 5 mg of vitamin B_2, 50 mg of vitamin B_6 and 0.4 mg of vitamin B_{12} ($n = 24$) or no supplements ($n = 24$) for 14 days. The treatment group and controls were matched for stroke subtype and age. Blood samples were obtained before intervention and also at 7 and 14 days post-recruitment for measurement of the following biomarkers: red cell folate (whole blood folate corrected with haematocrit), erythrocyte glutathione reductase activity coefficient (measure of vitamin B_2 status), plasma pyridoxal phosphate (vitamin B_6 status), plasma vitamin B_{12}, plasma α-tocopherol, plasma ascorbic acid, plasma TAOC (total antioxidant capacity), plasma MDA (malondialdehyde), plasma tHcy and CRP (C-reactive protein). Supplementation for 14 days with B-group vitamins significantly increased the plasma concentrations of pyridoxal phosphate and red blood cell folate and improved a measure of B_2 status compared with the control group ($P < 0.05$). Plasma tHcy decreased in both groups less in the control group, but differences in cumulative changes were not significant. There was, however, a decrease in plasma MDA concentration in the treatment group, in contrast with the increase seen in the control group and these differences were significant ($P = 0.05$). CRP concentration, a marker of tissue inflammation, was significantly lower in the treatment group compared with controls ($P < 0.05$)........... (*Ref: Clinical Science 2004;107:477-484*)

   a. States the research hypotheses (10%)
   b. How do you determine the sample size in this study? (10%)
   c. What is the study design (5%)?
   d. Specifies the predictor and outcome variables (10%)
   e. Think about the main conclusion that can be drawn from the study (5%)

2. Folate is a water-soluble vitamin. Several studies have found a relationship between folate deficiency and colorectal rectal adenoma and/or cancer risk. What are the possible mechanisms for the increased risk of developing cancer in people who have diets deficient in folate? (20%)

3. Please discuss how the micronutrients that may affect cardiac function. (40%)