Thesis Title Hematological and Plasma Biochemical Changes in Mini-marathon Runners.

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Date of Graduation 9 April B.E. 2534 (1991)

ABSTRACT

The effects of mini-marathon race on hematological and some plasma biological changes were studied in fifteen healthy female students who participated in 15-km mini-marathon race which was held by Bangkok College of Physical Education, Pathumthani in August 1988, with a mean age of 19.13±0.26 years (range 18-21) and a mean body weight of 49.65±1.54 kg (range 40.5-65.5). Venous blood samples were collected from antecubital vein at pre- and post- racing immediately (0 day), 1 day and 7 days. The evaluations included blood concentration of hemoglobin (Hb), percent hematocrit (% Hct), erythrocyte count (RBC), leukocyte count (WBC), glucose, BUN, uric acid, total protein, total and direct bilirubin, and some electrolytes (sodium, potassium, chloride and calcium ion). The physical fitness parameters (pulmonary functions, $\dot{V}O_2$ max, handgrip and vertical jump) were compared before and after

the race 7 days and were unchanged. Immediately after the race a mean weight loss was 1.40±0.09 kg with plasma volume reduction of 13.72±1.92%. The running velocities were in the range of 7.4 to 11.1 km.hr^{-1} during a mean ambient temperature of 28.2±0.17°C (range 27.5-29) and a mean relative humidity of 62.2±1.73% (range 58-68). No significant change wasobserved in RBC count, blood indices and some plasma electrolyte concentration (Na^+, K^+, Cl^- and Ca^{++}). The Hb, Hct and WBC were significantly increased from 12.78±0.3 g/dl, 38.59±0.42% and 7818±380 cells/mm^3, respectively to 13.85±0.26 g/dl (8.4%, $P<0.01$), 41.05±0.71% (6.4%, $P<0.01$), 12613±844 cells/mm^3 (61%, $P<0.001$), respectively. Leukocytosis occured with approximately 92%, 79% and 28% increase in absolute number of neutrophils, monocytes and lymphocytes, respectively. Plasma glucose, BUN, uric acid, total protein and direct bilirubin were significantly higher than the pre- level (from 85.25±1.91 mg/dl, 8.92±0.60 mg/dl, 4.90±0.26 mg/dl, 6.33±0.11 g/dl and 0.07±0.01 mg/dl, respectively to 106.67±4.76 mg/dl, $P<0.001$; 12.75±0.48 mg/dl, $P<0.001$; 8.35±0.68 mg/dl, $P<0.001$; 6.69±0.14 g/dl, $P<0.05$; 0.36±0.15 mg/dl, $P<0.01$; respectively). These elevations may be mainly attributed to the effects of hemoconcentration. However, these changes were in the normal ranges and declined with time towards the normal range in the recovery period.

In the present study, we may conclude that 15- km mini-marathon race does not have serious effects after

racing and does not significantly alter the hematological and plasma biochemical parameters in the recovery periods. The study in athletic or well-trained female subjects including the compositions in urine should be further investigated.