THESIS TITLE : DIURNAL VARIATIONS OF RISK FACTORS OF SUDDEN CARDIAC ARREST IN LAITAI - FAMILIES

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ABSTRACT

Sudden unexplained nocturnal death syndrome (SUNDS) or Laitai is a common disorder among people in North - Eastern of Thailand both living permanently and working in foriegn countries. However, its cause(s) is still unknown. The present study tested the hypothesis that the positive family history subjects displayed abnormal sympathetic function due to abnormal diurnal variations of serum sodium, serum potassium, and blood glucose level. The subjects were Thai men with 20 - 47 years of age. They were divided into three groups, a risk group, the persons with Laitai positive family history (n = 15) living in Umphur Wangsapung, Loe, and the controls, the persons with Laitai negative family history living in either Umphur Wangsapung, Loe (n = 12) or Umphur Nonsaard, Umphur Nonghan, Udonthani (n = 11). Measurment of diurnal variations of blood sugar, serum sodium, serum potassium, blood urea nitrogen, serum creatinine, blood pressure and pulse rate were done at 4.00 - 6.00 and 16.00 - 18.00 hours. The sympathetic function, estimated by measuring the blood pressure and pulse rate responses to cold exposure and exercise (step test) were done at the same time. The insulin resistance were estimated by oral glucose tolerance test after overnight fasting. All

three groups displayed nighttime decreases in systolic pressure, mean arterial pressure, pulse rate, and blood sugar significantly compared to those of the daytime ($P < 0.05$). The nighttime blood sugar levels were all below normal range (< 65 mg/dl). Blood urea nitrogen and serum creatinine of all subjects were within normal ranges and no diurnal variations of serum electrolytes were observed. These alterations and oral glucose tolerance were not significantly different among the three groups. Two minute immersion of the right hand up to the wrist in ice water (2-4°C) increased arterial pressure in all three groups, but the systolic pressure (the indicator of sympathetic activity by this test) of the positive family history group increased significantly less than that of the control group living in different area, both at the daytime (102.6 ± 2.7 vs 111.6 ± 3.9 mm Hg, $P < 0.05$) and the nighttime (102.9 ± 3.5 vs 112.5 ± 4.1 mm Hg, $P < 0.05$). Six minutes of exercise increased arterial pressure and pulse rate in all three groups, but the pulse rate (the indicator of sympathetic activity by this test) of the positive family history group increased significantly ($P < 0.05$) less than those of the two controls, both at the daytime and at the nighttime. This experiment indicates that the subjects with positive family history display low sympathetic activity without any correlation to diurnal variations of resting blood pressure, blood sugar, serum sodium, serum potassium and renal function. However, the fact that all three groups showed high risk of hypoglycemia, the decreased sympathetic per se might cause severe hypoglycemic shock without warning signs.