

## Cadmium Levels in Patients with Type 2 Diabetes Mellitus in Thasala Southern Thailand

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**Abstract :** Cadmium is a heavy metal that is important in the environment because it is highly toxic. The incidence and severity of type 2 diabetes mellitus are known to be associated with cadmium. The purpose of this study was to investigate the cadmium levels in patients with type 2 diabetes mellitus at diabetes mellitus clinic, Thasala hospital, Nakhon Si Thammarat, Thailand. The study population was composed of forty five subjects. Among them, twenty two were diabetic patients and twenty three were apparently healthy non-diabetic individual subjects. After an overnight fasting, blood and morning urine samples were collected from each subject to determine fasting blood sugar and cadmium levels in urine, respectively. Systolic and diastolic blood pressure values were measured by aneroid sphygmomanometer. Study approval was taken from the human subject ethics committee of Walailak University. Verbal and written informed consent was taken from all participants. In the study samples, there were 31.8% males and 68.2% females with mean age of 47+10.53 years. The geometric mean of urine cadmium was significantly higher in diabetic patients ( $1.015 \pm 0.79 \mu\text{g/g creatinine}$ ) when compared with the healthy subjects ( $0.395 \pm 0.53 \mu\text{g/g creatinine}$ ) ( $P < 0.05$ ). This result also showed that urine cadmium excretion in diabetic patients was higher than in healthy subjects by 2.6 times. Moreover, fasting blood sugar ( $153 \pm 47.86 \mu\text{g/dl}$ ) and systolic blood pressure ( $183.26 \pm 17.15 \text{ mmHg}$ ) of diabetic patients was significantly different when compared with healthy subjects ( $79 \pm 5.38 \mu\text{g/dl}$  and  $112.78 \pm 11.32 \text{ mmHg}$ , respectively) ( $P < 0.05$ ). Meanwhile, the concentration of cadmium in urine showed positive correlation with fasting plasma glucose ( $r = 0.616$ ) and systolic blood pressure ( $r = 0.487$ ). This preliminary study showed that cadmium might play an important role in the development and pathogenesis of diabetes mellitus in general population. However, these findings require confirmation through additional epidemiological and biological research.

**Keywords :** blood pressure, cadmium, fasting blood sugar, type 2 diabetes mellitus

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