CHAPTER IV

RESULTS

Results

Of the 248 persons who lived in Maesot, Tak province from table 5 has been divided into three levels of cadmium Cd $\geq$ 1.5-5 µg / g Cr, Cd <1.5µg / g Cr and Cd $\geq$ 1.5-5 µg / g creatinine which by the standards of WHO. The results from the studied were to show that at the age of the population increasing levels of cadmium accumulation in the body it increases significantly the statistical p-value <0.001 levels of cadmium accumulated in the body will affect renal function. And bone, which in this study the levels of ALP, NAG and U-Cd has increased significantly statistical p-value <0.001, p-value 0.002 and p-value < CrCl 0.001 respectively decreased significantly the presence of the p-value <0.001. (Table 5)

Table 5 Comparison of general characteristics of the cadmium-exposure

population by urine cadmium levels

Parameter	Cd <1.5µg/g Cr n=33 Mean ± SD	Cd 1.5-5 µg/g Cr n=140 Mean ± SD	Cd > 5 µg/g Cr n=75 Mean ± SD	p- value
Age (year)	45.69 ± 7.52	48.94 ± 8.42	53.01 ± 8.50	<0.001
WC (cm)	78.27 ± 6.93	77.61 ± 8.87	75.04 ± 8.91	0.075
Systolic (mmHg)	122.67 ± 13.3	125.19 ± 15.54	125.20 ± 15.89	0.682
Diastolic (mmHg)	77.24 ± 12.10	76.74 ± 9.89	75.67 ± 9.54	0.681
Glucose (mg/dl)	83.42 ± 4.56	86.41 ± 9.70	84.95 ± 8.25	0.164
BUN	15.27 ± 3.56	14.66 ± 3.71	15.93 ± 7.19	0.207
Creatinine	0.78 ± 0.14	0.77 ± 0.17	0.88 ± 0.82	0.216
Uric acid	5.60 ± 1.83	5.62 ± 1.71	5.43 ± 1.46	0.715
Cholesterol (mg/dl)	200.97 ± 74.57	198.28 ± 41.81	199.48 ± 51.19	0.957
Triglyceride (mg/dl)	213.24 ± 119.99	176.35 ± 111.91	175.44 ± 85.74	0.461
HDL-C(mg/dl)	43.76 ± 10.76	44.71 ± 11.45	44.44 ± 12.56	0.913
LDL-C(mg/dl)	114.56 ± 35.73	118.29 ± 42.77	119.95 ± 47.32	0.838
AST	31.81 ± 18.20	27.46 ± 10.48	29.53 ± 13.25	0.385
ALT	26.76 ± 12.93	23.31 ± 10.19	25.09 ± 17.67	0.335
ALP	68.30 ± 20.74	81.87 ± 22.75	89.44 ± 27.11	<0.001
NAG	17.72 ± 9.20	17.25 ± 10.71	23.52 ± 16.81	0.002
eCrCl	93.29 ± 19.41	87.88 ± 22.19	75.43 ± 21.47	<0.001
MDA (µmol/l)	4.24 ± 1.27	4.39 ± 1.31	4.13 ± 1.64	0.441
LOOH(µmol/l)	7.65 ± 10.87	6.48 ± 5.32	6.87 ± 5.42	0.624
Total antioxidant (mmol/l)	418.67 ± 18.26	411.92 ± 28.21	406.60 ± 35.17	0.135
UCd	1.14 ± 0.30	2.96 ± 0.99	8.70 ± 5.71	<0.001

Note: WC = waist circumstance, HDL-C = High densiy lipoprotein cholesterol,

LDL-C = Low-density lipoprotein cholesterol, AST = Aspartate

aminotransferase, ALT = Alanine aminotransferase, ALP = Alkaline

phosphatase, NAG = N-acetyl-β-D-glucosaminidase, eCrCl = Estrimate

creatinine clearance, MDA = Malondialdehyde, LOOH = Lipid hydroperoxide,

UCd = Urine Cadmium

From Table 6 Assessment of the health status of the population of Mae Sot district, Tak province, which is the level of eCrCl that the efficiency of the kidneys to filter waste. The levels of eCrCl follow to Kidney Disease Outcome Quality Initiative (KDOQI) are eCrCl> 90, eCrCl 60-89 and eCrCl 30-59 eCrCl high levels indicate the ability to filter waste, which in this study shows that age population living in Mae-Taw and Mae-Gu more than living in the area indicate the long-term ability of the kidneys to filter waste reduction is statistically significant at p-value <0.001. Levels of BUN, Creatinine, ALP, UCd and NAG have higher statistical significance p-value <0.001, p-value <0.030, p-value <0.045 and p-value <0.014 respectively.

Table 6 Comparison of general characteristics of the cadmium-exposure population by using the different eCrCl levels

Parameter	eCrCl > 90 n=94 Mean ± SD	eCrCl 60-89 n=123 Mean ± SD	eCrCl 30-59 n=31 Mean ± SD	*p*- value
Age (year)	44.96 ± 5.62	50.70 ± 7.48	60.42 ± 9.79	<0.001
WC (cm)	79.50 ± 8.60	76.04 ± 8.50	72.61 ± 7.62	<0.001
Systolic (mmHg)	123.77 ± 14.68	125.43 ± 16.02	125.87 ± 15.20	0.679
Diastolic (mmHg)	77.12 ± 11.27	77.07 ± 8.98	72.23 ± 9.62	0.042
Glucose (mg/dl)	86.00 ± 10.03	85.74 ± 8.30	83.58 ± 6.21	0.396
BUN	13.78 ± 3.68	15.24 ± 3.54	18.81 ± 9.74	<0.001
Creatinine	0.69 ± 0.13	0.81 ± 0.15	1.14 ± 1.24	<0.001
Uric acid	5.39 ± 1.82	5.62 ± 1.56	5.83 ± 1.43	0.379
Cholesterol (mg/dl)	200.36 ± 57.64	198.16 ± 86.53	198.19 ± 31.40	0.946
Triglyceride (mg/dl)	207.99 ± 76.73	168.00 ± 86.53	150.61 ± 54.72	0.098
HDL-C(mg/dl)	42.93 ± 12.16	44.36 ± 10.27	49.87 ± 14.00	0.015
LDL-C(mg/dl)	115.83 ± 45.40	120.20 ± 48.83	118.20 ± 33.82	0.763
AST	28.72 ± 14.20	28.67 ± 12.72	28.52 ± 6.55	0.998
ALT	24.32 ± 14.26	25.00 ± 13.29	21.52 ± 9.13	0.426
ALP	77.64 ± 22.81	84.02 ± 25.92	90.03 ± 22.94	0.030
NAG	16.39 ± 10.23	20.32 ± 14.54	23.34 ± 12.42	0.014
eCrCl	107.17 ± 14.03	75.64 ± 8.33	53.57 ± 18.76	<0.001
MDA (µmol/l)	4.10 ± 1.33	4.45 ± 1.50	4.25 ±1.27	0.201
LOOH(µmol/l)	7.16 ± 6.83	6.66 ± 5.32	5.88 ± 4.97	0.605
Total antioxidant (mmol/l)	408.77 ± 35.88	412.31 ± 24.23	414.29 ± 28.22	0.565
UCd	3.59 ± 3.21	4.92 ± 5.01	5.21 ± 3.84	0.045

Note: WC = waist circumstance, HDL-C = High densiy lipoprotein cholesterol, LDL-C = Low-density lipoprotein cholesterol, AST = Aspartate aminotransferase, ALT = Alanine aminotransferase, ALP = Alkaline phosphatase, NAG = N-acetyl-β-D-glucosaminidase, eCrCl = Estimate creatinine clearance, MDA = Malondialdehyde, LOOH = Lipid hydroperoxide, UCd = Urine Cadmium

From the Simple correlation test (Table 7) the result shown that there are positive correlation between ALP with year and U-Cd (r = 0.324, P = 0.005 and r = 0.290, P = 0.012), ALT positive correlation with eCrCl (r = 0.286, P = 0.013), AST positive correlation with U-Cd and eCrCl (r = 0.298, P = 0.009 and r = 0.229, P = 0.048), BUN positive correlation with ALP and MDA (r = 0.332, P = 0.004 and r = 0.282, P = 0.014), negative correlation with eCrCl and TAC (r = -0.357, P = 0.002 and r = -0.308, P = 0.007), Creatinine positive correlation with ALP and MDA (r = 0.257, P = 0.026 and r = 0.272, P = 0.0018), negative correlation with TAC (r = -0.439, P = <0.001), eCrCl negative correlation with age (r = -0.560, P = <0.001), LOOH negative correlation with HDL-C (r = -0.300, P = 0.009), MDA positive correlation with LOOH (r = 0.521, P = <0.001), NAG positive correlation with AST, ALT and uric acid (r = 0.500, P = <0.001, r = 0.394, P = <0.001 and r = 0.298, P = 0.009), TAC negative correlation with LOOH (r = -0.335, P = 0.003), Triglyceride negative correlation with LOOH (r = -0.375, P = 0.001), Uric acid positive correlation with ALP (r = 0.331, P = 0.004) and U-Cd positive correlation with NAG (r = 0.281, P = 0.015).

Table 7 Correlation of variable among high urine cadmium level

Correlation between parameters		Correlation coefficient	
		r	*P*- value
ALP	Year	0.324	0.005
	U-Cd	0.290	0.012
ALT	eCrCl	0.286	0.013
AST	U-Cd	0.298	0.009
	eCrCl	0.229	0.048
BUN	ALP	0.332	0.004
	eCrCl	-0.357	0.002
	MDA	0.282	0.014
	TAC	-0.308	0.007
Creatinine	ALP	0.257	0.026
	MDA	0.272	0.018
	TAC	-0.439	<0.001
eCrCl	Age	-0.560	<0.001
LOOH	HDL-C	-0.300	0.009
MDA	LOOH	0.521	<0.001
NAG	ALP	0.394	<0.001
	AST	0.500	<0.001
	Uric acid	0.298	0.009
TAC	LOOH	-0.335	0.003
Triglyceride	TAC	-0.375	0.001
Uric acid	ALP	0.331	0.004
U-Cd	NAG	0.281	0.015

Note: AST = Aspartate aminotransferase, ALT = Alanine aminotransferase,
ALP = Alkaline phosphatase, NAG = N-acetyl-β-D-glucosaminidase,
eCrCl = Estimate creatinine clearance, MDA = Malondialdehyde,
LOOH = Lipid hydroperoxide, UCd = Urine Cadmium