

Eight-year Follow-up Study (from 1998 to 2006) about Effects of Cadmium (Cd) on Renal Functions among Japanese Population Living in a Non-polluted Area.

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Objective: To examine the effects of Cd on renal functions over 8 years among Japanese residents living in a non-polluted area. **Methods:** *Study population:* 258 Japanese (128 men and 130 women) working or worked at one company in Toyama prefecture, Japan. 24-hour urine samples were collected in 1998 and spot urine samples were collected in 2006. *Analytical Method:* urinary Cd and two urinary tubular renal markers as β -microglobulin (β 2-MG) and N-acetyl- β -D-glucosaminase (NAG) were measured. In 2006, serum Cystatine C (CYS-C) playing as a glomerular renal marker was also determined. **Results:** In 1998, urinary Cd showed correlations with urinary B2MG ($r=0.233$, $p=0.008$ and $r=0.239$, $p=0.007$ in men and women, respectively) and urinary NAG ($r=0.31$, $p<0.001$ and $r=0.214$, $p=0.015$ in men and women, respectively). In 2006, urinary Cd showed correlations with urinary B2MG ($r=-0.004$, $p=0.969$ and $r=0.211$, $p=0.017$ in men and women, respectively) and urinary NAG ($r=0.374$, $p<0.001$ and $r=0.355$, $p<0.001$ in men and women, respectively). The Correlation Coefficient of urinary Cd, B2MG, NAG between 1998 and 2006 were 0.832, 0.361, 0.43, respectively. After 8 years, the mean value of urinary Cd increased from 1.96 $\mu\text{g/g Cr}$ to 2.14 $\mu\text{g/g Cr}$ in men ($p=0.01$) and from 4.07 $\mu\text{g/g Cr}$ to 4.42 $\mu\text{g/g Cr}$ in women ($p=0.006$); the mean value of urinary NAG increased from 1.64 to 3.47 unites/g Cr in men ($p<0.001$) and from 1.89 to 3.9 unites/g Cr in women ($p<0.001$) and the rate of urinary NAG positive subjects (urinary NAG >9 unites/g Cr) also increased from 0.4% to 5.45% ($p<0.001$); even that the mean value of urinary B2MG decreased from 156.4 to 117.9 $\mu\text{g/g Cr}$ in men ($p<0.001$) and from 198.9 to 120.3 $\mu\text{g/g Cr}$ in women ($p<0.001$) but the rate of urinary B2MG positive subjects (urinary B2MG $>500\mu\text{g/g Cr}$) increased from 2.72% to 7% ($p=0.013$). CYS-C (in 2006) showed correlations with Cd ($r=0.22$, $p=0.012$), B2MG ($r=0.26$, $p=0.003$) and NAG ($r=0.16$, $p=0.074$) (in 1998) in women.