

Nickel exposure during sintering process and biomarkers of dose and renal effects

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Nickel absorption before and after measures to modernize a factory producing tools by means of metal dust sintering processes was studied. Nickel concentrations in the working environment and its potential absorption through the skin were monitored before and after a factory underwent modernization and compared with nickel excretion in urine. Kidney function was also assessed. Nickel concentrations in the air during sintering processes were low before and after the factory was modernized, whereas nickel excretion in urine was near the allowable biological limit (ten times higher than the reference values) beforehand, while it quickly dropped to just twice the level in controls afterwards. No biochemical evidence of kidney involvement was found. The high urinary nickel excretion during sintering processes despite the low environmental levels well demonstrates the role of the metal's absorption through the skin. Changes in the manufacturing procedures induces a marked decrease in the workers' nickel absorption. On the other hand, urinary nickel levels nearing the biological limit did not appear to have any effect on the workers' renal function.