

[P-43]

The Mechanism of Iron Transport After Intratracheal Instillation of Iron in Rats

Min Kwon^{1,3}, Byung-Sun Choi¹, Eon-Sub Park¹, Young Lim² and Jung-Duck Park¹
¹*College of Medicine, Chung-Ang University, ²St. Mary's Hospital, The Catholic University of Korea, ³Korea Testing and Research Institute for Chemical Industry*

Iron(Fe) is an essential element in biological process, however an excessive Fe is harmful to human health. Some of air pollutants are containing a high level of Fe, human lung could be over-exposed to Fe through inhaled air pollutants. In this study, the expression level of divalent metal transporter 1(DMT1) and metal transporter protein 1(MTP1) mRNA in lung and the concentration of Fe in lung and liver were analyzed to investigate the role of metal transporters in lung, after the intratracheal instillation of Fe into the Fe-deficient(FeD) diet fed rats and Fe-sufficient(FeS) diet fed rats. The feeding of FeD diet for 4 weeks in rats induced an Fe deficiency anemia. The concentration of Fe in lung and liver was lower in FeD-diet fed rats than FeS-diet fed rats. The levels of metal transporters mRNA expression were higher in FeD-diet fed rats than in FeS-diet. The concentration of Fe was increased with a dose-dependent pattern after intratracheal instillation of Fe into rats, while the level of Fe in serum and liver was not increased in low dose Fe administered rats. Therefore, DMT1 and MTP1 mRNA was highly expressed in FeD-diet or FeS diet fed rats, both, after intratracheal instillation of Fe. In summary, DMT1 and MTP1 mRNA was highly expressed in FeD-diet fed rats than FeS-diet fed rats. The over-exposure of Fe intratracheally induced high expression of metal transporters and increased deposition of Fe in lung in FeD-diet or FeS-diet fed rat, both, but did not increase the Fe level of serum and liver in low dose Fe administered rats. These results suggest that the role of metal transporters in lung might be different partly from duodenum under the environment of over-exposure Fe.

Keyword : Iron, Divalent metal transporter 1 (DMT1), Metal transporter protein 1 (MTP1), Lung, Intratracheal Instillation