

L. Endocrinology and Metabolism

Effect of Cadmium Chloride on the Plasma Insulin Level in Mice

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Experiments with ^{115m}Cd and ^{105}Cd have shown that cadmium is early deposited in the pancreas. On the other hand, it was said that massive cadmium change produced morphological change in the pancreas and in blood sugar level in experimental animals. Recently we have examined the effect of cadmium chloride on plasma insulin level in mice.

Experimental animals were ddN strain mice whose plasma was assayed for the immunoreactive insulin (IRI) under various conditions. The IRI was assayed by Phadebas® Insulin Test (Solid Phase Radioimmunoassay).

Results:

- (1) After subcutaneous injection of 0.03 mM/kg of CdCl_2 , 1 and 24 hours IRI were 64 and 69% of the control, respectively, in male mice, and 48 and 74% of the control, respectively, in females.
- (2) After subcutaneous injection of 0.03 mM/kg of ZnSO_4 , either 1 or 24 hours IRI did not

show any difference from the control.

- (3) After 1 month administration of aqueous solution of 146 ppM CdCl_2 , IRI was not different from the control.
- (4) When BAL 1 mg or GSH 10 mg was given subcutaneously in addition to subcutaneous CdCl_2 0.03 mM/kg, 1 hour IRI was restored to the normal range.
- (5) When subcutaneous ZnSO_4 3 mM/kg was added to subcutaneous CdCl_2 0.03 mM/kg, 1 hour IRI was normal, while 24 hour was increased significantly.
- (6) After 24 hour fasting, IRI was 79% of the control, but the difference was not significant.
- (7) At 15, 30 and 60 minutes after oral 100 mg glucose, IRI were 202, 228 and 156%, respectively, of the control.

These results indicate that cadmium may inhibit the production or secretion of insulin and that SH radical and Zn may have some bearing on the site of this action.