

## **Abstract of Doctoral Dissertation**

### **Title: Study on efficacy and safety of zinc acetate dihydrate administration in preterm infants with hypozincemia**

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This thesis presents a study of factors affecting the efficacy and safety of zinc acetate dihydrate when administered to preterm infants with hypozincemia.

First, serum zinc and copper concentrations in preterm infants after administration of zinc acetate dihydrate were examined in 63 cases. After administration of zinc acetate dihydrate, serum zinc concentration reached 70  $\mu\text{g/dL}$  or higher in 16 cases (25.4%). The dose of zinc acetate dihydrate and the serum copper concentration at the start of administration were significantly higher in the group in which the serum zinc concentration reached 70  $\mu\text{g/dL}$  or higher. The serum copper concentration decreased in 19 cases (30.2%). The group with decreased serum copper concentrations had significantly lower corrected gestational age and body weight at the start of treatment and significantly higher serum zinc concentrations. These results suggest that higher doses of zinc acetate dihydrate may be necessary to increase serum zinc concentrations early when administered to preterm infants with hypozincemia.

Next, factors that reduce serum copper concentrations were examined in 70 patients. Serum copper concentrations decreased in 21 cases (30.0%) after administration of zinc acetate dihydrate. Logistic regression analysis detected corrected gestational age as a significant factor in the decrease in serum copper concentrations; the cutoff value of corrected gestational age for the decrease in serum copper concentrations in the ROC curve was 34.143 weeks. Therefore, when zinc acetate dihydrate is administered to preterm infants with low corrected gestational age, especially those less than 34 weeks, it was thought that attention should be paid to the decrease in serum copper concentrations.

In conclusion, we found an increased risk of decreased serum copper concentration with zinc acetate dihydrate administration in preterm infants with lower corrected gestational age. We believe that our findings provide useful information for the implementation of pharmacotherapy for preterm infants with

hypozincemia.