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A STUDY ON EQUINE PLASMA CERULOPLASMIN

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Ceruloplasmin (Cp) was isolated from equine fresh plasma by ammonium sulphate precipitation (35–55%), DE–52 anion exchange chromatography and EAH-Sepharose 4B chromatography. Isolated protein was identified as an undegraded homogeneous Cp by the A_{610}/A_{280} ratio of 0.047 ± 0.002, the oxidase activity of P-phenylenediamine, and its immunological cross-reactivity with anti-human Cp.

Purified equine Cp is a glycoprotein having a molecular weight of 115,000. In cellulose acetate membrane electrophoresis and immunoelectrophoresis, equine Cp had alpha-1 mobility while human Cp had alpha-2 mobility. By isoelectric focusing, the isoelectric point of equine Cp was estimated to be about 4.15. Equine Cp consisted of about 890 amino acid residues, a number which was somewhat smaller that those of other animals.

The serum Cp concentration in normal houses, pregnant mares and artificially-induced inflamed horses was measured by the single radical immunodiffusion (SRID) method.

In normal horses, the Cp concentration ($M \pm SD$) of newborn foals was 2.87 ± 0.40mg/ml, which was half the concentration of the adult. The concentration in normal horses at three months rose to 5.02 ± 0.92mg/ml, which was similar to the adult. The Cp concentration in 2-year-old houses reached to the peak level of 6.06 ± 0.74mg/ml. At 5-year-old, it was 4.37 ± 0.90mg/ml and there was no marked changes of Cp concentration in normal horses older than 5-year-old.

The Cp concentration in mares was not statistically different for the perinatal period, although a transient decrease was observed immediately before and after delivery. The concentration of Cp in the pregnant mare was 5.05mg/ml, which slightly higher than that in the normal mare (4.37mg/ml).

In the artificially-induced inflamed horses, the concentration of Cp increase at the 6th day after the induction of inflammation, reached the peak level on the 7th to 14th days, about twice as high as the control level, and returned to the control level on the 28th day.