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Changes in rat serum high molecular weight alkaline phosphatase following phenobarbital treatment

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Background and Aims: High molecular weight alkaline phosphatase (HMW- ALKP) isoenzyme has now been reported to be elevated in patients with extra and intra hepatic cholestasis and malignancy liver disease. The major aim of this study was to investigate various doses of phenobarbital on the activity of this isoenzyme and also other liver enzymes including SGOT and SGPT in rats.
Methods: Male Wistar rats were injected (IP) with varying amounts of phenobarbital (10-100 mg/kg BW) daily from 5 to 60 days. Animals were killed at indicated time and sera were collected for liver enzyme determinations and also for isoenzymes fractionation using gel filtration chromatography technique and Sephcryl-S300. ALKP, SGOT and SGPT activities were determined using laboratory methods.
Results: Short and long term effects of phenobarbital on ALKP, SGOT and SGPT activities were investigated. Data obtained show that with increasing doses of phenobarbital administration the activities of all three enzymes were elevated significantly $P<0.05$. In comparison with control group the elevations were between 19-79 percent for SGOT and SGPT and up to 79 percent for ALKP. Using gel filtration chromatography and Sephacry-S300, it was found that the elevation of serum ALKP was mostly due to HMW-ALKP. Mitochodria and Cytosolic SGOT were also fractionated in both control and phenobarbital treated rats. Elevation in mitochondria isoenyme was seen following treatment.
Conclusions: The elevation of HMW-ALKP activity in phenobarbital treatment animal may suggest the occurrence of biliary disease. This may be used as a biomarker for the diagnosis of toxicity in phenobarbital user patients.

Keywords: HMW-ALKP; Phenobarbital; SGOT; SGPT