

HEPATIC GLUTATHIONE S-TRANSFERASE RELEASE
AFTER MULTIPLE HALOTHANE ANAESTHESIA

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Halothane is a commonly used anaesthetic in paediatric practice. However, it is thought to be hepatotoxic. This study was designed to examine the effects of both single and multiple halothane anaesthesia on liver function. Hepatic glutathione S-transferase (GST) was also examined as a possible index of acute liver damage.

The study group consisted of ten children who had consumed corrosive substances. This group was subdivided into two groups, depending on the number of halothane exposures, the single and the multiple halothane group. These children were compared with a surgical (n=5) and a ketamine control group (n=5). All children were studied prospectively over a 24hr. period, and the trend of liver enzyme release following anaesthesia measured. In addition, the children in the multiple halothane group were studied longitudinally.

Four children from the study group, exhibited dramatic increases in the B₁ subunit of liver specific GST; 24 hours after anaesthesia. Twelve studies showed an early transient rise in total plasma GST, between the end

of anaesthesia and 6 hrs. after. Six studies exhibited a marked secondary rise at 24 hrs. after anaesthesia. These data indicate two possible phases of liver dysfunction following halothane anaesthesia.

Significant changes in the level of aminotransferases were observed in the multiple halothane group, suggesting that measurement of these liver enzymes are still useful as indices of liver dysfunction following multiple halothane exposure.

Cellular antioxidant systems were also measured to examine the relationship between halothane exposure and oxidative stress. A significant increase ($p < 0.05$) in red cell GST was noted in the multiple halothane group, indicating that these children are in fact subjected to chronic oxidant stress.

Collectively, these data indicate a transient impairment of hepatocellular integrity following multiple halothane exposures, despite lack of clinical evidence of hepatotoxicity. It is recommended that children undergoing repeated halothane anaesthesia be examined carefully for possible hepatic dysfunction.