

## **LASER SMOKE AND HEMOGLOBIN OXIDATION AT LAPAROSCOPY**

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**Objectives:** Laparoscopic procedures which generate smoke confine this toxic material to the abdominal cavity. Absorption of liquid material occurs via peritoneal absorption. Absorption of smoke components through the peritoneum have not been evaluated. To appraise and quantify whether any components generated by tissue combustion processes is absorbed, a study assessing the changes in blood concentration of methemoglobin was designed.

**Design:** Laparoscopic procedures using laser were compared to control groups.

**Materials and Methods:** Thirty-five patients having smoke generated by a laparoscopic procedures had methemoglobin evaluation prior to induction of anesthesia, at 5, 15, 30, 60, 120 and 180 minutes after smoke production. Thirty five control patients having laparoscopic procedures without smoke generation were similarly evaluated for methemoglobin concentration.

**Results:** All patients in the smoke generating group beyond the 15 minute period showed statistically significant acute elevation of methemoglobin. At 5 minutes 80% (28/35) showed these changes. Post-operatively 74% (26/35) demonstrated a return to normal pre-operative levels within 3 hours. No control patient developed an abnormal methemoglobin level.

**Conclusion:** These data demonstrate that elevation in blood methemoglobin level occurs acutely due to a smoke component of tissue combustion produced by laser use during laparoscopic procedures. The effects of this prolongs intra-abdominal smoke exposure is seen in some patients as post operative nausea, dizziness and visual disturbances. Increased levels of methemoglobin reduce oxygen carrying capacity to tissues, locally and at distant sites. This effect of hemoglobin oxidation is not detected by standard pulse oximetry monitoring. The specific components of the smoke causing the changes in methemoglobin is under investigation.”