Title: RECALL OF SURGERY IN VICTIMS OF MAJOR TRAUMA: EFFECT OF ANESTHETIC DOSE

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Introduction. After major trauma, hemodynamic instability frequently dictates that the dose of anesthetic agents used during surgery be reduced. In other situations requiring anesthesia, most notably obstetrics, the use of reduced doses of anesthetics can lead to awareness of surgery and to later distressful recall of this awareness. To determine the effect of reduced anesthetic dose on the incidence of recall of surgery and on the importance of recall to victims of major trauma, we interviewed trauma patients according to a prospectively designed protocol. In addition, we retrospectively tried to determine which factors present in trauma patients predictably prevent recall of surgery despite a reduced dose of anesthetic agents.

Methods. We studied 51 adult victims of major abdominal, thoracic, or orthopedic trauma without an associated head injury. All patients underwent general anesthesia without premedication or the use of an amnestic agent. Anesthetic management was not altered by the study. The study was approved by the Committee on Human Research.

To determine the incidence and importance of recall, each patient was interviewed 1 to 4 days after surgery. The interviewer was unaware of the anesthetic and intraoperative course. The importance of any awareness during surgery was assessed by first asking the patient to describe his two worst hospital experiences. If awareness during surgery was mentioned in response to this question, recall was considered to be important to the patient. The patient was then asked to describe what specific details he recalled about his surgery.

After the interview, each patient was categorized into one of two groups according to preestablished criteria. The criteria were based on indicators of the dose of anesthetic agents received. Group I patients were considered to have received lower doses of anesthetics because they were either intubated without an anesthetic or had not received anesthetics for 20 or more consecutive minutes during surgery, or both. Group II patients were considered to have received higher doses of anesthetics because they received an anesthetic for intubation and, although anesthetics may have been discontinued during surgery, they were never discontinued for more than 20 consecutive minutes.

To determine which factors predictably prevented recall despite a reduced dose of anesthetics, the medical and the anesthetic records of Group I patients with recall were compared with the records of Group I patients without recall. The incidence and importance of recall in the two groups were compared by means of chi square analysis. Factors that might predictably prevent recall were determined by means of the Mann-Whitney test. A p value less than 0.05 was considered significant.

Results. Patients who received lower doses of anesthetics (Group I) had a significantly greater incidence of recall of surgery (6 of 14, 43%) than patients who received higher doses of anesthetics (Group II, 4 of 37, 11%). The overall incidence of recall for the two groups was 20% (10 of 51).

The importance of recall was similar in the two groups. Two of the 6 patients in Group I and 2 of the 4 patients in Group II who recalled their surgery considered awareness of surgery to be their worst hospital experience. Pain during surgery was the most distressing feature of their awareness.

No factor predictably prevented recall of surgery when anesthetics were discontinued for 20 or more consecutive minutes. When Group I patients who had recall were compared with Group I patients who did not have recall, there was no significant difference in emergency room or preinduction systolic blood pressure, lowest temperature or lowest pH during surgery, or blood alcohol concentration. Furthermore, there was no significant difference in consecutive minutes without anesthetics, blood pressure while not receiving anesthetics, or type or dose of anesthetic agent given. Mean age (30 years) and type of injury were also similar.

Discussion. When the dose of anesthetic agent given to trauma patients during surgery is reduced, the incidence of recall of surgery is striking (43%). The proportions of important recall are lower when the entire study sample is considered. Only two of the 14 patients who received lower doses of anesthetics (14%) and two of the 37 patients who received higher doses (5%) considered their recall distressing enough to be a "worst hospital experience". This difference between the two groups was not significant.

Before this study, we believed that the physiologic consequences of severe injury, e.g., hypotension, hypothermia, and acidemia would help to prevent recall if the dose of anesthetic agents had to be reduced.[1] On the contrary, we found a greater incidence of recall in more severely injured patients (Group I) despite hypotension and hypothermia. However, other factors present in trauma patients, such as younger age, lack of premedication, and increased endogenous catecholamines resulting from stress, are known to increase the dose of anesthetic agents necessary to provide anesthesia.[1] The complex interaction of these factors may be the reason why we could not determine which factors predictably prevented recall when anesthetic agents were discontinued for 20 or more consecutive minutes during surgery for major trauma.

Reference.

1. Quasha AL, Eger EI II, Tinker JH: Determination and applications of MAC. Anesthesiology 53:315-334, 1980