

**Effects Of Sevoflurane And Isoflurane
On Coagulation System:
A Comparative Study**

Thesis

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IN

Anesthesiology

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English Summary

Several studies of the effects of inhalational anesthetic agents on platelet function have been reported since Ueda demonstrated in 1971 that clinical concentrations of halothane inhibited ADP-induced platelet aggregation. Sevoflurane in particular has recently been the subject of several investigations, however, the results remain contradictory. Platelets play an important role in hemostasis during and after surgery.

Among multiple factors, interactions of drugs used in anesthesia with platelet function have been implicated to aggravate the risk of perioperative bleeding.

Aim of the work

In this study, the aim was to assess the effects of sevoflurane and isoflurane on the coagulation system.

Results

The results of this study showed that red blood cells count, hemoglobin level, blood pH values and vital signs measurements were insignificantly changed during the predetermined times of measurements. Sevoflurane had a significant inhibitory effect on intraoperative platelet aggregation. Also, it had a residual suppressive effect 1 hour postoperatively, whereas it had no significant effect on other coagulation parameters including platelet count, bleeding time, prothrombin time and activity and activated partial thromboplastin time. As regards isoflurane, it had no significant effect neither on platelet aggregation nor other coagulation parameters during the intraoperative and postoperative periods.

Summary And Conclusion

Several studies of the effects of inhalational anesthetic agents on platelet function have been reported since Ueda demonstrated in 1971 that clinical concentrations of halothane inhibited ADP-induced platelet aggregation. Sevoflurane in particular has recently been the subject of several investigations, however, the results remain contradictory. Platelets play an important role in hemostasis during and after surgery. Among multiple factors, interactions of drugs used in anesthesia with platelet function have been implicated to aggravate the risk of perioperative bleeding.

In this study, the aim was to assess the effects of sevoflurane and isoflurane on the coagulation system.

After patients' written and informed consents had been taken, 60 male and female patients aged 20-45 years old, ASA physical status I or II, were studied during elective ophthalmic surgery. Exclusion criteria were pregnant females, patients suffering from coagulation disorders, cardiac, hepatic or renal disease. Patients known to be on anticoagulant therapy, oral contraceptives, non steroidal anti-inflammatory drugs within 24 hours before surgery or acetylsalicylic acid within 5 days before operation were also excluded from the study.

Patients were randomly divided into two groups (30 patients each): isoflurane group (group I) and sevoflurane group (group S) according to the inhalational anesthetic used for maintenance of anesthesia. Vital signs as regards mean arterial pressure, heart rate, body temperature and arterial oxygen saturation were assessed preoperatively, 1 hour after induction of anesthesia and 1 hour postoperatively. Blood samples were withdrawn at the same times of measurements mentioned previously to measure red

blood cells count, hemoglobin level, platelets count, bleeding time, prothrombin time and activity, activated partial thromboplastin time, pH and platelet aggregation tests.

The results of this study showed that red blood cells count, hemoglobin level, blood pH values and vital signs measurements were insignificantly changed during the predetermined times of measurements. Sevoflurane had a significant inhibitory effect on intraoperative platelet aggregation. Also, it had a residual suppressive effect 1 hour postoperatively, whereas it had no significant effect on other coagulation parameters including platelet count, bleeding time, prothrombin time and activity and activated partial thromboplastin time. As regards isoflurane, it had no significant effect neither on platelet aggregation nor other coagulation parameters during the intraoperative and postoperative periods.

So, the conclusion of this study is that sevoflurane has a significant inhibitory effect on intraoperative platelet aggregation, whereas isoflurane has no effect. There is also a residual suppressive effect 1 hour postoperatively with sevoflurane. Therefore, in patients at increased risk of intraoperative and postoperative bleeding, isoflurane may be preferred as an inhalational agent for maintenance of general anesthesia.