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Research Article

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Comparison between the Effect of Halothane and Isoflurane on Post-Operative Shivering in Emergency Cesarian Section

Dr Saad Abood Sulaiman [1], Dr Luay Badr Hasan [2] and Dr. Ahmed Al-Mantafji [3]

[1] *MBChB, CABA&IC, Specialist of Anesthesia and Intensive Care, Tikrit Teaching Hospital, Salah Aldin, Iraq.*
[2] *MBChB, CABA&IC, Specialist of Anesthesia and intensive care, AlTuz General Hospital, Salah aldin, Iraq.*
[3] *MBChB, FICMS(ans), Specialist of Anesthesia and intensive care, Baghdad Teaching Hospital, Medical City, Baghdad, Iraq.*

Abstract: Background: Postoperative shivering is an observed feature of the perioperative period . the type of surgery, medication, duration of anesthesia, and various patient factors all contribute to the condition. **Aim of study:** To compare the effect of halothane and isoflurane on postoperative shivering in emergency cesarian section. **Patient and method**: This was a Prospective comparative study conducted during the 1st of November, 2012 till the 28th of January,2013 at Department of Anesthesia, Baghdad teaching hospital ,Baghdad medical city complex, Baghdad, Iraq Eighty patient with emergency Cesarian section, and all of them were with ASA I and II classification. Patients were divided into two groups randomly (40 patients each), group(A) were received halothane and group (B) received isoflurane. Each individual patient was monitored and observed carefully postoperatively the presence of shivering episodes were recorded in the recovery room. **Result**: shivering were more prevalent among cases who received Halothane rather as among those of isoflurane group. A highly significant association between the type of medication and the occurrence of nausea and vomiting, at recovery time and at 6 hours' time p.value < 0.001. **Conclusion**: halothane was the leading cause of postoperative shivering. So it would be better to avoid halothane as it will increase the oxygen consumption.

Keywords:. Shivering, postoperative, halothane, isoflurane.

INTRODUCTION

Shivering is an involuntary , oscillatory , muscular activity that augments metabolic heat production[1]. The fundamental tremor frequency on the electromyogram in humans is typically near 200 Hz . A slow 4-8 cycles/min waxing and waning pattern modulate this basal frequency[2]. Although shivering is but one consequence of perioperative hypothermia and rarely the most serious, it occurs frequently (in 40-60% of the patients who received volatile anesthetics) and affects a number of physiological parameters . When the core temperature falls by approximately 1ºC , shivering occurs and total body oxygen consumption and carbon dioxide production increases[3], the occurrence of shivering after anesthesia has been recognized for many years, and has been variously described as 'Pentothal shakes' . 'Shivering' , 'Postoperative spasticity', and 'Spontaneous postanesthetic tremor' . The use of these imprecise terms displays our lack of complete understanding of the physiological mechanism behind the phenomenon[4]. The changes in body temperature may be detrimental and it is important therefore that anesthesiologists understand normal thermoregulation and the ways in which this process may be affected by anesthesia[5].

The loss of consciousness during general anesthesia abolishes thermal sensation , but it is generally held that the sensitivity of thermoreceptors is not impaired [6]. With the exception of ketamine, all general anesthetic agents impair thermoregulation , presumably by attenuation of hypothalamic function .

Nearly all patients administered general anesthesia become hypothermic, typically by 1-3 °C , depending on the type and dose of anesthesia , amount of surgical exposure and ambient temperature[7].

Induction of general anesthesia promotes vasodilatation via two mechanism:

- General anesthesia reduces the vasoconstriction threshold to well below core temperature[8], thus inhibiting centrally mediated thermoregulatory constriction .
- Most of the anesthetics cause direct (peripheral) vasodilatation[8]. Vasodilatation allows core heat , which is no longer constrained to the central thermal compartment , to flow down the temperature gradient into peripheral tissues[9]. This internal redistribution of body heat decreases core temperature . Any systemic cooling that occurs simultaneously will augment core hypothermia.

Shivering caused hypothermia perioperatively leads to various detrimental consequences. Greater the shivering, greater is the oxygen consumption. Cardiac output increases proportionally to oxygen consumption, severe mixed venous desaturation with consequent arterial hypoxemia results. Even

*Corresponding Author: Dr Saad Abood Sulaiman

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mild hypothermia 0.5°C to 1.2°C below the normal core temperature triggers sympathetically mediated hypertension resulting from a 100-700% increases in the circulating levels of nor-epinephrine and generalized systemic vasoconstriction[10]. These adrenergic and metabolic responses to shivering can upset the balance between myocardial oxygen supply and demand leading to myocardial ischemia or infarction especially in patients with pre-existing coronary artery disease, intrapulmonary shunts, fixed cardiac output and limited respiratory reserves[11].

Patients and methods:

This was a Prospective comparative study conducted during the 1st of November 2012 to the 28th of January 2013 at Department of Anesthesia, Baghdad teaching hospital ,Baghdad medical city complex, Baghdad, Iraq One hundred patient with emergency cesarian section , and all of them were with ASA I and II classification, , their ages range (20 – 40) year and the weight of patients ranged (60-100 kg).

Inclusion criteria:

- ASA class I and II.
- Age between (20-40) years.
- Emergency cesarian section.

Patient were excluded if there is history of fever or blood transfusion within 24 hours of the operation .All patients were prepared properly to the operation and appropriate medications were given before the induction of anesthesia. duration of whole operation (Anesthesia and Surgery) was about 45_75 minutes Patients were divided into two groups randomly (50 patients each), group(A) were received halothane as maintenance of anesthesia and group (B) received isoflurane .both group received thiopentone 5 mg/kg, Suxamethonium 1 mg/kg, ketamine 0.5mg/Kg, dexamethasone 8 mg metoclopramide 10 mg , atracurium 0.5 mg/kg, endotracheal intubation, Monitored by SPO_2 , NIBP , pulse rate , ECG ,reversed by neostigmine 2.5mg and atropine 1.2 mg. All patients received an intravenous infusion of Ringer lactate solution at ambient temperature. The operating theatre temperature was maintained at 27 ± 0.5°C.

No warming blanket was used during the operative procedure and no blood or blood products given. All patients were covered with the standard gown and sterile drapes. Each individual patient was monitored and observed carefully postoperatively, the shivering episodes were recorded in the recovery room in both groups. room. The occurrence and duration of shivering were assessed by one of the investigators who was unaware of the induction agent given to the patient. Shivering was defined as any involuntary movements resembling those seen normally in thermoregulatory shivering.

RESULTS

A randomized study of 50 patient undergone GA to compare the effect of both halothane and Isoflurane on postoperative shivering.

It was found that there is highly significant difference between halothane and isoflurane with p-value 0.00004 where 13 patient of halothane group developed shivering and only 4 patient developed shivering in isoflurane group and as the following table and graph.

Table 1: shivering in both groups.

	Group	No.	Mean	St. Deviation	p-Value
Shivering	Halothane	50	0.26	0.20452	0.00004
	Isoflurane	50	0.08	0..13701	

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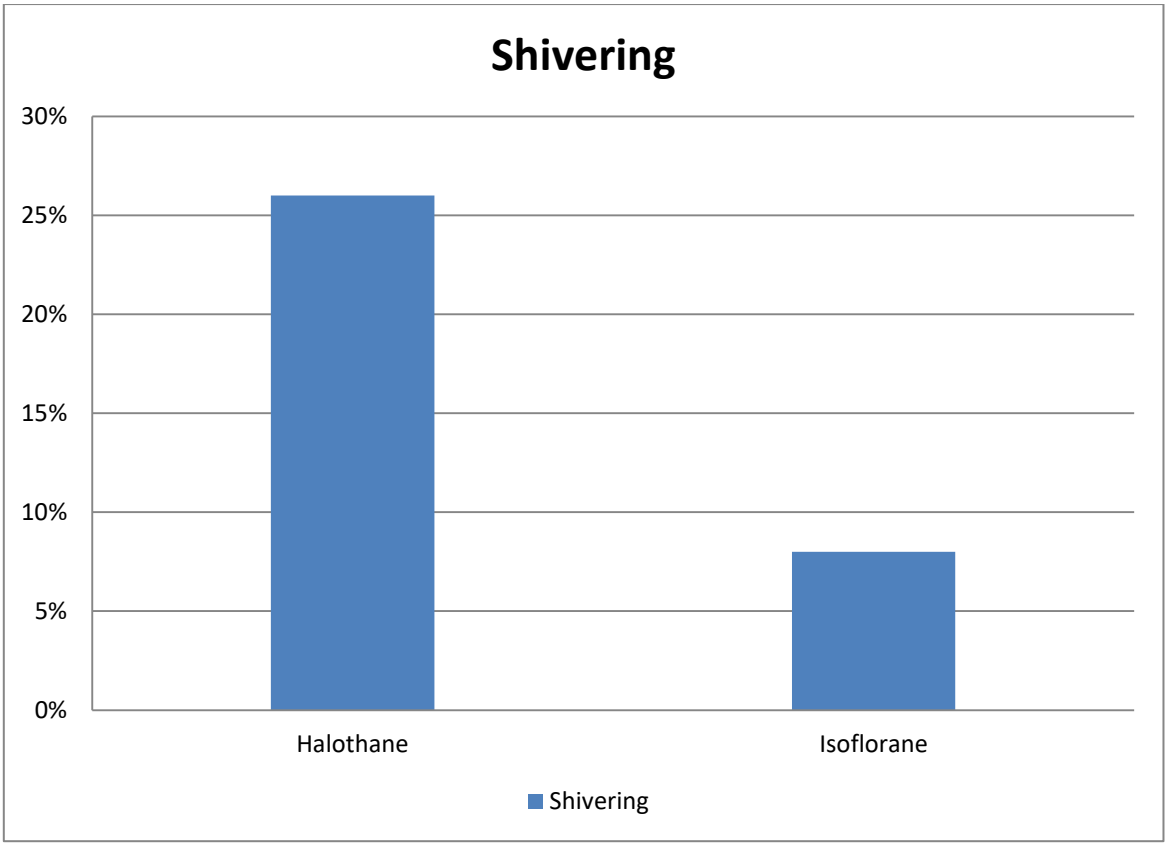

Figure 1: shivering in both groups

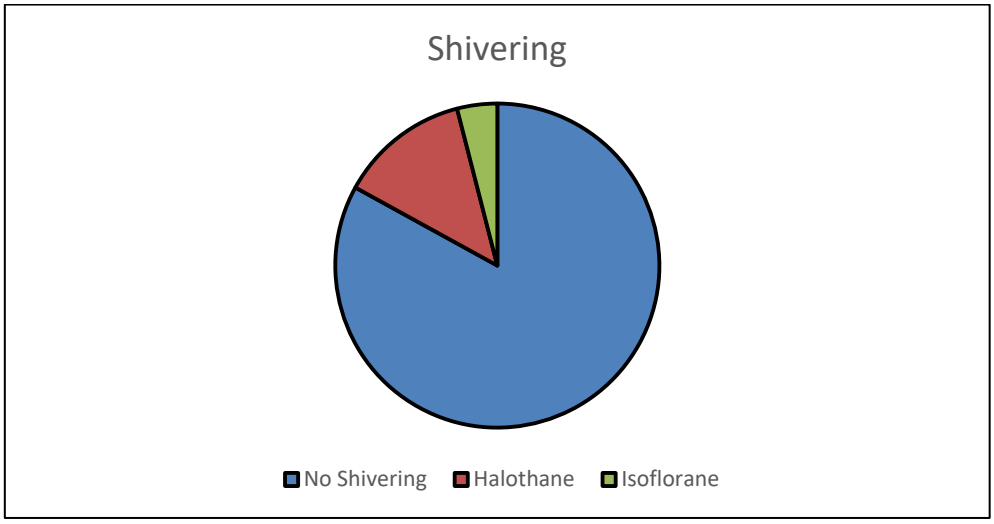

Figure 2: chart to show the total percent.

DISCUSSION

Post-operative shivering is one of the most common morbidity that follow the surgery , causing increase in oxygen consumption and need for many drugs like meperidine , clonidine , oxygen therapy which lead to increase the cost. Therefore we should be away from the drugs that increase shivering.

According to our data, the use of halothane was the strongest risk factor for development of post-operative shivering.

CONCLUSION

Isoflurane is a safe drug to be administered for maintenance of anesthesia as compare with halothane in relation to postoperative shivering .

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