Original Research Article

# Intraoperative awareness during general anaesthesia, in patients with blood loss equal to or more than 20% of blood volume: An observational study

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## Abstract

**Background and Aims:** intraoperative awareness during general anaesthesia leads to anxiety, depression and post traumatic stress disorder. We studied incidence of awareness in surgeries with blood loss of 20% and more. We used Brice questionnaire to access awareness. **Material and method:** it was a prospective observational questionnaire based type of study. After institutional ethics committee approval, patients undergoing general Anaesthesia and having blood loss of 20% and more were selected for study. Questionnaire asked on second post operative day to access awareness. **Results and conclusion:** incidence of awareness was 1.9% in patients with blood loss equal to or more than 20% of blood volume. Awareness was seen mainly in female patients, which is in the form of stretching type of pain which was recalled by patients on second post operative day. Dreaming incidence was about 3.8%of total.

**Key Word:** intraoperative awareness, blood loss, prospective.

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## INTRODUCTION

Awareness under general Anaesthesia is unexpected and explicit recall by patients of events that occurred during general Anaesthesia. As many as 1 to 2 per 1000 patients who receive general Anaesthesia experience awareness, and the incidence may be even higher among children[1,2]. Though awareness is rare, it leads to unfavorable postoperative consequences such as anxiety, post traumatic stress disorder, depression and sleep disturbances. Patients who suffers awareness fear's future surgery and Anaesthesia[3]. Awareness mainly correlated with depth of Anaesthesia, risk of awareness is high when patient under muscle relaxant having light plane of Anaesthesia. Awareness is found mostly in cardiac, thoracic, obstetrics and trauma cases. light plane of Anaesthesia found in conditions like major blood loss, inadequate dosages of drugs, resistance to anaesthetic drug's, equipment malfunction[4]. Thus we studied incidence of intraoperative awareness under general anesthesia mainly in patients with blood loss equal to or more than 20% of blood volume. As blood loss leads to hypotension and to mantain intraoperative vitals and to prevent further hypotension, there is tendency to decrease in depth of Anaesthesia by withholding drug's and inhalational agents by anaesthologist.[5] as this decrease in depth sometimes leads to awareness. we used Brice questionnaire to access awareness. assessment was done on second post operative day. Accordingly answers given by patients were classified as aware, not aware and had dream[6].

## MATERIAL AND METHOD

It was a prospective, observational and questionnaire based type of study, patients involving in study were

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undergoing general Anaesthesia and had blood loss of 20% or more. After obtaining institutional ethics committee approval and written informed consent from the patients involved in study, total 50 patients were enrolled in study. Sample size calculation was done by using SSCP with level of confidence 95% and expected p(prevalence)as 0.5% and d(precision) as 0.05% as per correlated articles.

**Statistical analysis:** All collected data entered in Microsoft excel sheet, it was then transferred to SPSS statistics for windows, version 17 for statistical analysis. Quantititive data was presented as mean and standard deviation. Qualitative data was presented as frequency and percentage. Graphical presentation was done where deemed necessary. Data were described in terms of mean(+/- standard deviation), frequencies and percentage where appropriate.

**Exclusion criteria were as follows:**

- mentally retarded patients
- chronic drug abuse patients
- Chronic pain patients.
- Neurosurgery patients.
- Patients refusal
- ASA 3 and 4
- age <18 and >65

preanesthetic evaluation, baseline investigations, and written informed consent was obtained from patients who fulfilled the inclusion criteria. patients were shifted to operation theatre. After securing intravenous access, standard monitors were applied. All patients received injection Midazolam(0.03-0.05mg/kg) as premeditation. Induction of Anaesthesia was done with Injection fentanyl(1-2micrograms/kg), Injection propofol (1-2mg/kg) and Injection vecuronium (0.1mg/kg). Anaesthesia was maintained with isoflurane in added with oxygen and nitrous(50-50%). Inhalation agents were titrated to maintain blood pressure, MAP above60% and dial settings were adjusted to maintain hemodynamic. Target MAC of 1% was kept with inhalation agents. The patients were ventilated with tidal volume of 6-8ml/kg, respiratory rate of 8-12breaths per minute to maintain end tidal CO2 between 30-35mmHg. Vital parameters such as HR,SBP,DBP,MAP, electrocardiogram( ECG), oxygen saturation( SpO2),MAC value , dial settings were maintained and recorded intraoperatively. If any episode of hypotension followed by blood loss was observed, then inhalation agents were titrated. Blood loss estimation was based on blood sucked in suction bottles and soaked gauze. total blood volume was calculated as 70ml/kg, thus percentage volume of blood lost was calculated. Injection Fentanyl 0.5micrograms/kg was repeated as per vitals and requirements for analgesia. Injection Paracetamol 10mg/kg was given for postoperative analgesia. Inhalational agents were stopped just before the last stitch of skin closure. Patients were reversed with Injection neostigmine 0.05mg/kg + Injection Glycopyrrolate 0.08mg/kg. patients fulfilling extubation criteria, endotracheal tube extubated. Patients were followed on next day of surgery to assess awareness, patients were asked Brice questionnaire as follow[7],

1. what was last thing you remember before going to sleep( being in preoperative are, Mask on face, seeing operating room)
2. What was first thing you remember after waking up?(feeling breathing tube, mask on face, in recovery room)
3. Did you had any pain during surgery.( Yes/ No)
4. Did you hear or see something during surgery.( Talking, noises, seeing light on head)
5. Did you had any dream during surgery; if yes then what was dream like.
6. During surgery weather you had feeling of anxiety or helplessness.( Yes/No)

Based on answers patients gave, were classified into aware, not aware and had dream

1. Aware-able to recall event's during Anaesthesia and surgery
2. Not aware- not able to recall anything
3. Dreaming- special entity, not considered as awareness.

## RESULTS

Total 50 patients were included in our study, data from them were collected and analysed. the demographic data including age less than 20 years of 15.1%,21-40 years 39.6%, 41-60 years were 35.8% and>60 years 9.4%. Male patients around 73.6% and females were 26.4%. ASA 1 patients were 67.9% and ASA2 were 32.1%. Blood loss of 20-30% blood volume were 31 patients, 30-40 % were 16 patients and more than 40%were 3 patients. There were 26.4% patients with hemodynamic instability. being in preoperative area was the first thing remembered by34% of patients. Only 1.9% of patient complained of stretching type of pain which was remembered by patients on second post operative day and considered as awareness. Our study concludes incidence of awareness was 1.9% in patients with blood loss equal to or more than 20% of blood volume. awareness was in the form of stretching type of pain, which was recalled by patient on second post operative day. This suggests that awareness should be kept in mind whenever blood loss is there. dreaming incidence was 3.8% of total. Dreaming incidence equal in both male and female. Dreaming was considered as special entity in our study.

## DISCUSSION

Awareness during Anaesthesia leads to fear. Patients becomes more conserved about further surgeries and can sometimes leads to refusal of surgery. It leads to stress, anxiety and depression among patients. many awareness studies available in literature but no studies on blood loss and awareness. So we tried to find out incidence of awareness in patients with blood loss equal to or more than 20%of blood volume. This specific group is because as blood loss occurs there is tendency to decrease depth of Anaesthesia to mantain hemodynamic, which leads to awareness. Awareness is purely based on patients subjective experiences. After surgery patients may remember some or all events during surgery and it is possible that patients didn't feel anything or might have felt moderate or intense pain or pressure if analgesics hadn't been adequate. many questionnaire are there but we used modified version of Brice and colleagues questionnaire. To access patients were followed on next day, questionnaire asked and answers given by patients used to classify them into aware not aware and had dream, accordingly conclusion of our study was made. Incidence of awareness was found to be 1.9% in our study. Awareness was in the form of stretching type of pain and was remembered by patients on second post operative day. It was seen in patients who bled intraoperatively more than 20% of blood volume and had hemodynamic instability, in this patient depth of Anaesthesia was decreased to maintain hemodynamic. Lopez and colleagues administered two interviews adapted to children's cognitive abilities in 410 patients aged6-16 years, respectively, within 24h and 1 month of surgery. Awareness was defined as the coding of awareness and third adjunctor as possible awareness. This resulted in an incidence of awareness 1.2%.[8] Davidson and colleagues administered a structured postoperative interview to 864 children aged 5-12 yr within 24h, and at 3 and 30 days after surgery. Cases were classified as awareness when all 4 adjudicator agreed on this. Thus, seven cases classified as awareness, giving incidence of 0.8%.[9] As previous research in adults has demonstrated an increased risk of awareness in severely ill patients ASA physical status 3 and 4 undergoing major surgery. Older studies reports incidence of awareness between 0% and 5%.[10,11] Comparison with this studies differ as Anaesthesia techniques and drug's have changed vividly over time. to facilitate comparison studies need to be complete replica of previous studies. There are several risk factors for awareness including use of muscle relaxant, inadequate plane of Anaesthesia, hypotension. All these conditions and incidence of awareness should be kept in mind while anaesthetising a patient. According to Domino B, Caren *et al* claims for recall occurs during maintenance phase of Anaesthesia. Auditory perception without pain being most common occurrence during emergence from Anaesthesia. female gender being more prone for awareness. Anaesthetic techniques using muscle relaxant without inhalation agents and light plan of Anaesthesia increase awareness 2-3 times[12].

**Strength and limitations of study:** Strength of our study was that, it was a prospective study design. As there are very few such studies available to access. awareness studies are there but studies showing specific criteria of patients including 20% or more blood loss are less. It is helpful to come out with incidence of awareness in patients with blood loss. The limitation of study is that, less number patients were enrolled, and it is a single institutional study. The generalizability of such findings is limited by inclusion of patients containing only ASA 1 and 2. Clinical trials with larger sample size and employing multiple parameters of assessment of Anaesthesia and in settings of different surgical procedures need to be done. Thus our conclusion with this study is that awareness should always be kept in mind whenever there is blood loss. As awareness incidence is of 1.9% of total whenever blood loss is there. dreaming without pain is also considered sometimes as pleasant. But pain followed by auditory type of awareness is always unpleasant for patients.

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