ORIGINAL ARTICLE

Music and its Effect on Sedative Requirements in Patients Undergoing Procedures under Regional Anaesthesia

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ABSTRACT

Objective: The study was carried out to detect the effect of music and elimination of operating room noises on the dose requirement of propofol as sedative in awake patients undergoing urological procedures under regional anaesthesia.

Design: Case-Control study

Place of Study: This study was carried out at Departments of Anesthesiology & Surgery, G.G.S. Medical College and Hospital, Faridkot, India.

Patient and Methods: 75 patients who were to undergo different procedures under spinal anaesthesia were randomly divided into three groups: Group I (control group) patients exposed to normal operating room noises; Group II patients with occlusive head phones but no music and Group III patients with occlusive head phones and music of their choice. Ramsay sedation score was used to assess the level of sedation, which was maintained at the level of 3 and monitored every 5 minutes. The head phones were removed temporarily to assess the sedation level. The Sedation was achieved with inj. propofol, and total close used was noted.

Results: As compared to group I (control group), patients of group II and group III showed statistically significant ($p< 0.05$) reduction in propofol requirement as compared to Group-I (24.52 +4.12 vs 19.80 + 4.04 and 18.56 + 3.56) to attain the sedation score of 3 on Ramsay Sedation Score. Patients of these groups showed no statistically significant difference in propofol requirement when compared with each other. Group II patients did not hear any music but required statistically significant ($p< 0.05$) less propofol as sedative as compared to group I.

Conclusion: The elimination of ambient and disturbing operating room noises is sufficient enough to reduce the sedative requirement of propofol in anxious awake patients under spinal anaesthesia. Music, as a non pharmacologic adjunct to relieve anxiety may further reduce this requirement.

Key words: Anaesthesia; Propofol; Ramsay Sedation Score; Music

INTRODUCTION

Anxiety of the patient undergoing surgery under regional block leads to physiological changes, which may be detrimental to the well being of the patient. Surgical procedures performed using regional anaesthesia techniques or monitored anaesthesia can present a special challenge to the anesthesiologists because patients are awake and exposed to multiple anxiety provoking visual and auditory stimuli[1]. A calm, quiet and tranquil environment is desired where surgery is being performed under regional block[2]. This is achieved by both non pharmacological as well as pharmacological methods. Non pharmacological methods are used to decrease the requirement of sedating drugs and their associated side effects.

Music from time immemorial has been used for celebration, enjoyment and relaxation and has catered humanity to sooth him in both his enjoyment and his sorrow. Music has been one of the most widely used methods for distraction in day to day life. It has also been used to divert attention from unpleasant and stressful situation[3]. Surgery is a stressful phenomenon, both mentally and physically. The physical pain can be relieved by medication, but the psychological end of the stress needs to be addressed. Music has and will remain the medium of choice by humans to relieve him of stress in any form. The use of music by surgeons in the operation theatre to improve their concentration and reduce fatigue is well known. Kane et al., in 1914 were the first ones to provide intraoperative music to distract patients from the fears of surgery[4]. By late 1930, Farr et al. advocated the use of intraoperative music during surgical procedure under local anaesthesia. A group of dentists in 1960 reported the use of routine music during dental surgery and 65% - 90% of their patients needed little or no anaesthesia for dental extraction5. Keeping in view all these facts we investigated effect of music on sedative requirements in patients undergoing procedures under regional anaesthesia.

MATERIAL AND METHODS

The study was conducted in patients of ASA grade I & II scheduled for elective surgical procedures. The study was approved by the hospital ethics committee and a written informed consent was taken from all the patients. A thorough pre-anaesthetic check-up and routine investigations were done in all the patients. Complete ENT examination was done. Patients with sensorineural deafness, impacted wax, temporomandibular perforation, diabetes mellitus, hypertension, CNS disease or refusing any kind of music intraoperatively were excluded. Among initially selected patients 75 volunteered to participate in this study. They were randomly allocated into 3 groups of 25 each: Group I patients without occlusive head phones (Control), Group II patients with occlusive head phones but no music and Group III patients with occlusive head phones and music of choice. All the patients were explained that headphones may be applied to their ears during the surgery and may or may not contain some music. The choice of music was enquired from each patient. Microphone and music were displayed the night before the surgery to the patient. Patients were allowed to self medicate to a comfortable level of sedation or analgesia, and the anesthesiologist played no role in helping patients attain this state. Patients were told explicitly that music would help them relax or lessen their perception of pain.

Box 1: The Ramsay sedation scale for assessing the sedation

Score	Description	Assessment
0	Awake, oriented	awake
1	Agitation, restless, anxious	inadequate
2	Awake, cooperative, ventilation tolerance	adequate
3	Asleep, but cooperatively (opens eyes to loud speech or touch)	adequate
4	Deep sedation (opens eyes on shaking not speech, prompt response to pain stimulus)	adequate
5	Narcosis (sluggish response to pain)	deep
6	Deep coma (no response to pain stimulus)	too deep

Premedication was given in the form of injection atropine (0.6 mg) and injection promethazine (0.75 mg/kg) 45 minutes before induction of anaesthesia. After shifting the patient to operating room an intravenous line was set up and 0.9% NaCl infusion was started. Baseline blood pressure, pulse rate, SpO_2 and level of sedation, as per Ramsay sedation score (Box 1) were recorded. Under aseptic conditions, 2.5 ml of 0.5% bupivacaine was injected in the subdural space at L3-L4 interspace level.

Patients were given propofol at a concentration of 2mg/ml in 100 ml bottles and the drip rate was adjusted to achieve a sedation equivalent to Ramsay score of level 3 by assessing the patients response to command. Propofol was stopped immediately before study was completed.

At the end of study total amount of propofol required was noted. Throughout the procedure, the vitals and the level of sedation were recorded every 5 minutes till the end of the surgery. The data was recorded as mean and standard deviation or otherwise stated. Group means and proportions were compared by Student-t test and Chi square test respectively. A p-value < 0.05 was considered significant.

RESULTS

Out of 75 patients, 54(72%) were males and 21 (28%) were female. Male to female ratio was 2.57: 1. Maximum number of cases (40%) was in the age group of 31-40 years, followed by 32% in the age group of 21-30 years, 16% in the age group of 41- 50 years and 4% in the age group of 51-60 years. The mean duration of surgery in all the three groups was similar. The mean SpO_2 levels during surgery in the three groups were comparable and difference was not significant (data not shown). Table-I shows the mean pulse rate and systolic blood pressure of patients of three groups at baseline (before the start of regional analgesia) and during surgery. The mean pulse rate and systolic blood pressure during the surgery was lower as compared to the baseline. But the differences in both parameters in all three groups were not statistically significant.

Table I: Effect of surgery on mean pulse rate and systolic blood pressure in three groups of patients.

Parameter	Group I (Mean ± SD)	GroupII (Mean ± SD)	Group III (Mean ± SD)
Pulse rate (Per min)			
Baseline	89.20 ± 4.54	90.10 ± 3.42	89.24 ± 3.44
During surgery	78.30 ± 3.22	79.32 ± 2.98	78.42 ± 3.22
Systolic BP (mm Hg)			
Baseline	150.26 ± 2.99	148.24 ± 3.20	150.40 ± 2.35
During surgery	134.84 ± 2.76	136.24 ± 2.78	137.840 ± 2.48

The mean Ramsay sedation score and propofol requirement in all the three groups is shown in Table II. The mean Ramsay sedation scores of three groups were almost similar and p value was not statistically significant ($p < 0.05$). However, the propofol requirement in Group I to achieve this score was higher (24.52 +4.12 vs 19.80 + 4.04 and 18.56 + 3.56) as compared to the other two groups. There was insignificant difference in this parameter inbetween Group II and III.

Table II: Ramsay sedation score and propofol Requirement as sedative

		Group I No. of patients (%)	Group II No. of patients (%)	Group III No. of patients (%)	p-value
Ramsay Sedation Score	1	0	0	0	
	2	3 (12)	4 (16)	5 (20)	p< 0.05
	3	22 (88)	21 (84)	20 (80)	p< 0.05
	Mean ± SD	1.12 ± 0.33	1.16 ± 0.37	1.20 ± 0.40	p< 0.05
Propofol requirement (mg)		24.52 ±4.12	19.80 ± 4.04	18.56 ± 3.56	p< 0.05

DISCUSSION

In the present study, group III patients who were exposed to music of their choice with occlusive head phones required statistically significant less propofol (18.56 + 3.56 mg) as compared to group I and the difference was significant ($p<0.05$). Similarly in group II patients, where only occlusive head phones were applied, there was statistically significant less requirement of propofol (19.8 + 4.04 mg) as compared to group I patients ($p< 0.05$). However, the difference between propofol requirement in group II & III was not significant. This clearly showed that just eliminating the disturbing operating room noises is sufficient to reduce the requirement of propofol as a sedative and listening to music of choice may be an additive factor of significance in patients undergoing surgical procedures under regional anaesthesia.

Therapeutic use of music for relieving day to day stress need not be emphasized. Our results are in accordance to the generalization that the patients who received music in combination with therapeutic suggestions require significantly less rescue analgesia on the day of surgery. It has been shown that music has same positive effects on postoperative recovery and patients had less pain, felt significantly less fatigued at discharge and could sit up earlier after the operation[6]. We played a relaxing and calming music accompanied by soothing sounds of sea waves, specially developed for relaxation.[2] According to our results, a better alternative would be to provide taped soothing music or music in combination with therapeutic suggestions to patients undergoing surgery. Such a non invasive intervention may improve postoperative recovery[4]. Our results are in support of the proposal that surgeons, anesthetists and nursing staff should exercise restraint in their conversations to eliminate intraoperative noise, since some of these conversations may be retained even by the patient under general anaesthesia[7]. For this purpose routine use of ear plugs has been suggested in the past[8].

Several physiologic and biochemical explanations for the calming effects of music are proposed. The gate control theory is based on the promise that pain is the result of integrated sensory, affective, motivational system that modulates noxious input and attenuates the perception of nociceptive input[9]. Auditory input is known modulator of the human response to stress[3]. The influence of music and acoustic stress on gut hormone levels already has been shown. Studies of other biochemical changes associated with listening to music, such as alterations in endorphin levels, in the future may provide the chemical frame works for this inhibition.

The number of patients in our study was very small, that being the main limitation of the study. Hence any positive effect of music as compared to elimination of the operating room noses by ear plugs or ear phones could not be ascertained. That probably requires a larger sample and preferably a multi-centre study. However, the negative effect of operating room noises can clearly be documented. Further controlled studies are necessary to validate our results under different conditions and during surgical procedures.

CONCLUSION

Elimination of the disturbing operating room noises by occlusive head phones is sufficient enough to reduce anxiety in awake patients under surgery and listening to music of choice might also be of some significance for this purpose. A larger multi-centre study is required to determine a possible sedative advantage of music over merely elimination of the operating room noises.

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FAREWELL

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