Research Article

Comparative study between different drugs used for sedation before establishment of subarachnoid block

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Abstract
Background: Procedural discomfort is experienced by patients during the establishment of subarachnoid block even after good preoperative counseling and adequate premedication. The fear of needle prick, back pain during and after subarachnoid injection are becoming the leading causes for patient refusal to spinal anesthesia. To enhance comfort and to overcome the denial, procedural sedation that would provide good analgesia, faster recovery and amnesia is inevitable. **Materials and methods**: Patients with ASA status I and II posted for elective surgeries under subarachnoid block. They were randomized into 2 groups of 50 each. Group K/P received ketamine 0.5 mg / kg and propofol 0.5 mg / kg intravenously 5 minutes before subarachnoid block and Group P/F patients received 1 mg / kg propofol and 0.5µg / kg fentanyl intravenously 5 minutes before subarachnoid block. University of Michigan sedation score, response to spinal needle, hemodynamics of the patients, apnea, hallucinations, airway obstruction, recall of procedure, and patient satisfaction were evaluated. **Results**: Both drug combinations produced adequate sedation for performing subarachnoid block, UMSS score was comparable between them. Significant difference was observed in response to spinal needle during establishment of subarachnoid block. Patients received ketamine / propofol combination were mildly sedated with better response to spinal needle and more hemodynamic stability as compared with propofol/fentanyl combination. **Conclusion:** We conclude that ketamine /propofol combination in dose of ketamine 0.5 mg / kg and 0.5 mg / kg propofol provided adequate sedation to decrease patient's discomfort during establishment of subarachnoid block and provided more hemodynamic stability when compared with propofol/fentanyl combination in dose of 1 mg / kg propofol and 0.5µg / kg fentanyl
Keywords: subarachnoid block; sedation; propofol; ketamine; fentanyl

Introduction
Procedural discomfort is experienced by patients during the establishment of subarachnoid block even after good preoperative counseling and adequate premedication. This could be due to multiple reasons such as cold operating environment, new people, positioning, and obviously the procedure itself[(1)]. The fear of needle prick and the fear for back pain during and after subarachnoid injection is becoming the leading cause for the patient denial to undergo the procedure[(2)]. To enhance comfort and to overcome the denial, procedural sedation that would provide good analgesia, faster recovery and amnesia is necessary[(3)]. We compared the efficacy of ketamine/propofol versus propofol/fentanyl combination to decrease discomfort during establishment of subarachnoid blockade.

Methodology
After the approval from hospital ethics committee, a randomized prospective study was conducted in one hundred patients aged between 18 to 60 years of ASA status I and II posted for elective surgeries under subarachnoid block. Patients with compromised cardiovascular or respiratory function, psychologically disturbed patients, bleeding diathesis and pregnancy were excluded from the study. Procedures involving epidural placement were also excluded. After obtaining informed consent and accepted fasting, all patients were preloaded with 10 ml/kg normal saline solution in the preoperative holding area. The patients were shifted to operation room table and the baseline hemodynamic parameters were recorded. The patients were randomized to one of 2 groups by closed envelope technique. Group K/P received

ketamine 0.5 mg/kg and propofol 0.5 mg/kg intravenously 5 minutes before spinal anesthesia and Group P/F received 1mg/kg propofol and 0.5 µg/kg fentanyl intravenously 5 minutes before spinal anesthesia.

This drug preparation was done by a separate anesthesiologist who was not involved in the study. The patient identification was written on a slip and put back into envelope and sealed. By this way, the observer was blinded to the drugs given to the patient. The person doing the procedure and monitoring along with the patient was blinded to the drug. The study parameters were carefully evaluated. University of Michigan sedation score (Table 1) was noted 5 minutes after giving the drug.

The parameters monitored (heart rate, mean arterial blood pressure and oxygen saturation) were recorded every 3 minutes for 15 minutes. With aseptic precautions, subarachnoid block was performed using 22g Quincke spinal needle without local infiltration while the patient in the lateral position. The desired volume of bupivacaine 0.5% heavy was injected intrathecally. Response to spinal needle insertion was noted and graded by 4-point score (Table 2). Then the patient was placed in supine position for surgery. Apnea, airway obstruction and hallucinations if present were noted. The patient satisfaction was assessed by asking whether he or she would undergo spinal procedure again, if the need arise.

Results

The demographic profile was comparable with no statistically significant difference among three groups. Demographic profile is summarized in (Table 3).

Table (1): show University of Michigan sedation scale (4)

score	Assessment of sedation
0	Awake and alert.
1	Minimally sedated/sleepy, appropriate response to conversation &/or sounds.
2	Moderately sedated, somnolent/sleepy, easily aroused with light tactile stimulation &/ or Simple verbal command.
3	Deeply sedated, deep sleep, arousable only with significant stimulation.
4	Unarousable.

Table (2): show four point score for response to spinal needle (5)

score	clinical description
1	Gross patient movement
2	Back muscle contraction
3	Minimal patient movement
4	No patient movement

Table (3): Demographic data

	Ketamine/Propofol N=50	Propofol/Fentanyl N=50	P-value
Age (in years) **Range** **Mean ±SD**	 21-60 40.9±9.9	 21-58 36.7±9.1	0.320
Sex (males/ females) **Freq. (%)**	14/16 (46.7/53.3%)	18/12 (/60%40)	0.255
ASA **Freq. (%)**	28/2 (93.3/6.7%)	28/2 (93.3/6.7%)	0.494
Type of operation **Freq. (%)**	13/10 /7 (43.3/33.3 /23.3%)	15/7 /8 (50/23.3/ 26.7%)	0.872

As regard response to spinal needle twenty two patients had no movement in response to spinal needle in (K/P) group but twelve patients in (P/F) group with significant difference inbetween as shown in table (4).

Table (4): Show response to spinal needle insertion

	Ketamine/Propofol N=50	Propofol/Fentanyl N=50	P-value
Gross patient movement Freq. (%)	0 (0%)	5 (16.3%)	<0.001*
Back muscle contraction Freq. (%)	2 (6.7%)	4 (15.7%)	0.150
Minimal patient movement Freq. (%)	6 (20%)	9 (28%)	0.997
No patient movement Freq. (%)	22 (73.3%)	12 (40%)	0.019*

As regard sedation score, patients were moderately sedated in (K/P) group, patients were deeply sedated in (P/F) group

As regard mean arterial pressure, there was significant difference as MAP was lowered in (P/F) group in comparison with baseline with more hemodynamic stability in (K/P) group.

As regard heart rate and oxygen saturation, there was no significant difference between the two groups.

As regard complications, mild hallucinations were seen only in three patients in K/P group and was not observed in the other group and treated by midazolam 0.5mg/kg intravenously.

Discussion

Sedation is part of the general management of a patient receiving a regional block and being awake during the whole surgical procedure. The aims include general patient comfort, freedom from specific discomfort, and some amnesia for both the block procedure and the surgical operation, in order to meet the patient's preference and safety. Sedation has been shown to increase patient satisfaction during regional anesthesia[6].

The ideal sedative agent should also have minimal side effects, particularly a lack of hemodynamic impairment, respiratory depression, and thermoregulatory interference which may already be caused by a spinal block[7].

Our study reported that 22 patients (73.3%) in ketamine/propofol group and 12 patients (40%) in propofol/fentanyl group had no movement during establishment of subarachnoid block, this observation in agreement with Kumar et al., 2015[8].

Our study showed that ketamine/propofol keep blood pressure near to baseline in comparison with propofol/fentanyl which is useful finding to avoid hypotension due to sympathetic blockade which were in agreement with a study done by Kumar et al., 2015

Our study showed no changes in heart rate in ketamine / propofol, this was due to ketamine increase heart rate and propofol decrease it. This observation was in agreement Komatsu et al., 1995[9].

In our study three patients had experienced hallucinations in ketamine/propofol group. Although these experiences, the overall patient satisfaction with the technique chosen illustrates that the hallucinations were not perceived to be problematic, this is in agreement with Kumar et al., 2015

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