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Original article

Patient Satisfaction and Lack of Recall after Sedation in Patient Undergoing Cataract Surgery

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Abstract

Background: Cataracts are a common age-related condition where the lens of the eye starts to become cloudy. Advances in cataract surgical care have allowed virtually all cataract surgery to be conducted in an outpatient setting using local anesthesia. **This study aimed to** test the hypothesis that most cataract surgery patients have recall of only negligible portions of the Iowa Satisfaction with Anesthesia Scale items that they answered before discharge from the facility. **Methods:** This prospective cohort included 62 patients scheduled for cataract surgery, 31 patients assigned to group I delivered 50 microgram fentanyl & 1 mg midazolam for sedation, the other 31 patients delivered 50 microgram fentanyl. All cases underwent general examinations, laboratory investigations and their satisfaction with sedation was assessed with Iowa satisfaction with anesthesia scale**. Results**: 15 (48.4%) patients recalled 0 theme, 7 (22.6%) patients recall 1 theme, 5 (16.1%) patients recalled 2 themes, and 4 (12.9%) patients recalled 3 themes among group I cases, while in group II, there was no one recalled 0, 1 or 2 themes with significant difference among both groups, only one patient (3.2%) who recalled 3 themes, 2 (6.5%) patients recalled 4 themes, 5 (16.1%) patients recall 5 themes, 5 (16.1%) patients recalled 6 themes, and 7 (22.6%) patients recalled 7 & 8 themes for each and two patients (6.5%) recalled for both 9 & 10 themes. Conclusion: Our study revealed that the addition of midazolam dose to the sedation plan would improve the Iowa Satisfaction with Anesthesia Scale and was associated with recall of fewer themes from this scale

Keywords: Satisfaction; Lack of Recall; Sedation; Cataract Surgery.

Introduction

Cataracts are a common age-related condition where the lens of the eye starts to become cloudy. This leads to progressive vision impairment. Cataracts are easily treated with a simple surgical procedure to remove the cloudy lens and replace it with a new, clear lens, known as an intraocular lens or IOL (1). Advances in cataract surgical care have allowed virtually all cataract surgery to be conducted in an outpatient setting using local anesthesia. Major medical complications to patients are rare; adverse events occur in about 3% of patients and are limited to transient bradycardia or hypertension (2). In the light of this safety, many centers are reevaluating the rationale for costly intraoperative care processes (such as the provision of monitored sedation by anesthesiologists) to increase cost efficiency (3).

Sedation is strictly defined by reduced activity, alertness, and arousal. Procedural sedation encompasses the use of anxiolytic, sedative, hypnotic, analgesic, or dissociative medications that decrease patient awareness and facilitate patient cooperation with and tolerance of diagnostic or therapeutic procedures. Sedatives are given to provide analgesia and anxiolysis, to attenuate detrimental patient movement, and to reduce unpleasant recall (4). The ideal level of sedation is dictated by the category of procedure, patient physiology, and clinician preference.

The difficulty is that the actual degree of sedation induced by a given dose of a given sedative varies greatly among individuals, with the range sometimes extending from minimal sedation through moderate and deep sedation to general anesthesia (5).

Patient satisfaction ratings provide a means to evaluate and monitor quality of health care, especially in settings where adverse events are rare. Investigators have used simple ratings of patient satisfaction to assess the quality of their cataract care or to evaluate specific components of that care (6). Patient satisfaction with the care they receive can be measured using the reliable and valid Iowa Satisfaction with Anesthesia Scale (7).

We hypothesized that it may be invalid to assess patient satisfaction with sedation among patients so soon after receiving midazolam, because if most patients do not have recall, then the sedation cannot be considered complete at the time of the evaluation. We performed this trial to test the hypothesis that most cataract surgery patients (significantly greater than half of patients) have recall of only negligible portions of the Iowa Satisfaction with Anesthesia Scale items that they answered before discharge from the facility.

Patients and methods

This prospective intervention cohort was conducted on 62 patients at Benha University Hospital for 10 months. throughout the period from February 2023 till February 2024.

The patients divided into two groups: **Group I:** included 31 cases received 50 microgram fentanyl & 1 mg midazolam for sedation, **Group II:** included 31 patients received 50 microgram fentanyl.

The study was presented to the research Ethics Committee of faculty of medicine- Benha University and approved with approval code MS 38-2-2023. Informed consent was obtained from the patients before participating in this study.

Inclusion criteria were patients scheduled for cataract surgery and with their satisfaction with sedation assessed soon before (e.g., within 10 min of) leaving the outpatient surgery department consistent with the development and use of the Iowa satisfaction with anesthesia scale (8).

Exclusion criteria were patient refusal, patients who were selected by the surgeon to receive deep sedation or general anesthesia, with known local anesthetics and opioid allergies or with major respiratory, cardiac, renal or hepatic disorders.

All studied cases were subjected to the following: Full history taking, including [Personal history (age, sex, weight, duration of surgery, duration in recovery room, duration of phone call, BMI and comorbidities), present history (complaint, history of present illness), past history (chronic medical disorders, dosages and times of intravenous sedation medications (midazolam and fentanyl)), surgery starts and end time, recovery starts and ends time]. **General examination including [**vital signs (blood pressure, temperature, heart rate), chest, cardiac, lower limbs and upper limbs]. **Laboratory investigations [**complete blood count, random blood glucose, and urine analysis, liver and renal function tests].

Operational design:

All cataract surgery cases were performed in a single operating room of the Outpatient Surgery Department. The phase I and phase II post-anesthesia care units function interchangeably; henceforth, they are referred to as the ‘recovery room.

Technique:

During a preoperative visit, standard discharge instructions were reviewed with each patient. We took advantage of this uniform approach to have each patient serve as his/her own control. The patients were told that they would be asked to complete the survey shortly after entering the recovery room. Patients also were advised that they would receive a phone call the next day from one of the members of the anesthesia department with follow-up

questions. In the recovery room, the patients were informed that they would be provided with 11 statements, and they would need to choose to either agree or disagree with the options provided. For each statement with which they agreed, they would be asked whether they agreed 'slightly,' 'moderately,' or 'very much.' As patients had undergone ophthalmologic surgery, they were also given the option to have the questions read to them rather than reading the questions themselves. The patients were advised that within 24 h after discharge, they would receive a telephone call asking them: 'Please recite as many of the 11 questions you were asked yesterday.' The Iowa Satisfaction with Anesthesia Scale was used for several reasons. The scale assesses satisfaction with the anesthetic/sedation itself, including satisfaction with sedation; based on qualitative methods and quantitative correlations, surgical patients consider this separate from satisfaction with the preoperative and postoperative periods (8). The scale has good test-retest reliability and internal consistency.

Method measurements:

All the following data was collected: Fentanyl consumption (μg) and midazolam (mg) after surgery. Iowa Satisfaction with Anesthesia Scale, with the overall score and its components each ranging from –3 (agree strongly) to +3 (disagree strongly). Time to the first request (hrs.) for the rescue analgesia was recorded. Sedation to ISAS started (min), Sedation to phone call (h). Hemodynamic Parameters: [MAP (in mmHg) and HR (beats /minute)] were recorded.

Follow up:

During the follow-up phone call, the patients were asked to recall as many of the 11 questions they were asked the previous day. They were also asked to recall the discharge instructions about the eye patch that they were given both during the preoperative visit and before discharge from the recovery room. The following period was 10 months. All responses and times were recorded for both the survey on the day of surgery, and the follow-up questions on the day after surgery. Respondents' answers to questions were transcribed exactly as spoken by the patients.

Approval Code: MS 38-2-2023

Sample size:

The sample size calculated using epi info soft calculator version 3. Based on Chadha et al**.** (9) study results, the expected prevalence of lack of recall was 75%. C. I 80% power of the study 80% the total calculated sample size was 62 patients.

Statistical analysis:

Statistical analysis was done by SPSS v27 (IBM©, Chicago, IL, USA). Shapiro-Wilks test and histograms were used to evaluate the normality of the distribution of data. Quantitative data

were presented as mean and standard deviation (SD), parametric ones were analyzed by unpaired student t-test, while quantitative non-parametric data were analyzed by Mann Whitney-test. Qualitative variables were presented as frequency and percentage (%) and analyzed using the Chi-square test or Fisher's exact test when appropriate. Kendall's tau-b (τb) correlation coefficient (Kendall's tau-b, for short) is a nonparametric measure of the strength and direction of association that exists between two variables measured on at least an ordinal scale. A two-tailed P value < 0.05 was considered statistically significant.

Results

Table 1 shows the baseline characteristics and vital signs of both studied groups.

The duration of surgery ranged from 13 to 27 min with a mean of 18.8 ± 4.86 min, the duration in recovery room ranged from 10 to18 min with a mean of 13.6 ± 2.45 min and the duration of phone call ranged from 2 to 7 min with a mean of 3.8 ± 1.3 min among studied cases of group I, while the control group II was comparable to these results without any statistical significance. The median dose of Fentanyl consumption was 25 (25-50) mg among both groups, while the median dose of midazolam consumption was 1.5 (1-2) mg. **Table 1**

Table 2 shows the Iowa satisfaction with anesthesia scale and shows that the median IOWA total score was 3 (2-3) among group I cases, while in control group II was 4 (3-4).

Sedation to ISAS started ranged from 27 to 48 (min) with a mean of 32.6±4.18 among group I cases versus 48.2±9.24 among their controls (group II) with significant difference, Sedation to phone call ranged from 22 to 49 (mins) with a mean of 35.6±5.22 among group I cases versus 24.5±2.45 min in group II. **Table 3**

Fifteen (48.4%) patients recalled 0 theme, 7 (22.6%) patients recall 1 theme, 5 (16.1%) patients recalled 2 themes, and 4 (12.9%) patients recalled 3 themes among group I cases, while in group II, there was no one recalled 0, 1 or 2 themes with significant difference among both groups, only one patient (3.2%) who recalled 3 themes, 2 (6.5%) patients recalled 4 themes, 5 (16.1%) patients recall 5 themes, 5 (16.1%) patients recalled 6 themes, and 7 (22.6%) patients recalled 7 & 8 themes for each and two patients (6.5%) recalled for both 9 & 10 themes. **Table 4**

There was a positive significant correlation among studied patients of group I between IOWA score and age, while there was a negative significant correlation between IOWA score and Midazolam consumption and Fentanyl consumption, there was an insignificant correlation between IOWA score and other variables. **Table 5**

Table 1: Baseline characteristics, vital signs, clinical data and analgesic consumption of the studied patients

		Group I (n=31)	Group II (n=31)	P
Baseline characteristics				
Age (years)	**Mean± SD**	66.04±10.14	64.3±9.34	0.324*
	Range	50-79	52-75	
Sex	**Male**	13 (41.9%)	14 (45.2%)	0.213*
	Female	18 (58.1%)	17 (54.8%)	
Weight (Kg)	**Mean± SD**	75.28±6.86	72.4±5.67	0.089*
	Range	65-90	69-91	
Height (m)	**Mean± SD**	1.68±0.05	1.71±0.03	0.231*
	Range	1.59-1.75	1.61-1.72	
BMI (Kg/m^2)	**Mean± SD**	26.82±2.83	25.5±3.44	0.435*
	Range	22-32	23-30	
ASA physical status	**ASA II**	14 (45.2%)	15 (48.4%)	0.112#
	ASA III	17 (54.8%)	16 (51.6%)	
Vital signs				
HR (beat/minute) baseline	**Mean± SD**	80±5.61	82.3±4.32	0.654*
	Range	71-90	74-90	
HR (beat/minute) after 10 minutes	**Mean± SD**	78.6±11.97	79.4±9.22	0.455*
	Range	54-105	55-100	
MAP (mmHg) baseline	**Mean± SD**	74.6±9.32	76.3±8.43	0.509*
	Range	60-90	65-90	
MAP (mmHg) after 10 minutes	**Mean± SD**	77±6.67	77.9±7.65	0.788*
	Range	65-90	69-90	
Clinical data				
Duration of surgery (min)	**Mean± SD**	18.8 ± 4.86	20.1±3.54	0.322*
	Range	13-27	15-29	
Duration in recovery room (min)	**Mean± SD**	13.6±2.45	11.6±4.23	0.421*
	Range	10-18	10-18	
Duration of phone call (min)	**Mean± SD**	3.8±1.3	3.42±1.53	0.466$
	Range	2-7	2-7	
Analgesic consumption				
Fentanyl consumption (mg)	**Mean± SD**	40.6 ± 25.18	45.4±23.2	0.762$
	Median (IQR)	25(25-50)	25 (25-50)	
Midazolam consumption(mg)	**Mean± SD**	1.3 ± 0.59		
	Median (IQR)	1.5(1-2)		

BMI: body mass index, ASA: American Society of Anesthesiologists, HR: heart rate, MAP: mean arterial pressure
*Independent sample t-test #Chi-square test $Man-Whitney test

Table 2: Iowa Satisfaction with Anaesthesia Scale of the studied patients

		Group I (n=31)	Group II (n=31	P*
I felt pain	**Mean± SD**	1.21 ± 1.33	2.54±1.65	0.007
	Range	-1 – 3	2-3	
I felt pain during surgery	**Mean± SD**	1.41 ± 1.11	2.55±1.21	0.002
	Range	-1 – 3	1-3	
I was too cold or too hot	**Mean± SD**	2.12 ± 0.6	2.89±1.11	0.003
	Range	0 – 3	1-3	
I would want to have same aesthesia	**Mean± SD**	-2.2 ± 1.38	2.11±0.82	<0.001
	Range	-3 – 1	-1 –2	
I throw up or felt like throw-in	**Mean± SD**	1.8 ± 1.32	2.12±0.92	0.02
	Range	-1 – 3	1-3	
I itched	**Mean± SD**	2.1 ± 1.33	2.65±0.89	0.01
	Range	-2 – 3	1-3	
I felt relaxed	**Mean± SD**	-1.7 ± 1.46	1.98±1.12	<0.001
	Range	-3 – 2	-1 – 2	
I felt safe	**Mean± SD**	-2.6 ± 0.64	-1.71±0.76	0.002
	Range	-3 - -1	-2 – 0	
I felt good	**Mean± SD**	-2.3 ± 0.85	2.21±1.22	<0.001
	Range	-3 – 0	-1 – 2	
I hurt	**Mean± SD**	2.1 ± 1.42	2.34±0.87	0.03
	Range	-2 – 3	0 – 3	
I was satisfied with my anaesthesia	**Mean± SD**	-2.2 ± 1.13	2.45±1.03	<0.001
	Range	-3 – 1	-1 – 3	
IOWA total score	**Mean± SD**	2.2±2.58	3.22±1.56	0.01
	Median (IQR)	3(2-3)	3-4	

*Mann-Whitney test of significance

Table 3: Anaesthetic requirements of the studied patients

		Group I (n=31)	Group II (n=31)	P
Sedation to ISAS started (min)	**Mean± SD**	32.6±4.18	48.2±9.24	<0.001*
	Range	27-48	29-63	
Sedation to phone call (hours)	**Mean± SD**	35.6±5.22	24.5±2.45	<0.001*
	Range	22-49	22-27	

ISAS: Iowa Satisfaction with Anesthesia Scale *Independent sample t-test #Chi-square test

Table 4: No. of patients recall themes of the studied patients

		Group I (n=31)	Group II (n=31)	P
No of recall themes	**Recall 0**	15 (48.4%)	0	<0.001
	Recall 1	7 (22.6%)	0	0.01
	Recall 2	5 (16.1%)	0	0.05
	Recall 3	4 (12.9%)	1 (3.2%)	0.166
	Recall 4	0	2 (6.5%)	0.213
	Recall 5	0	5 (16.1%)	0.052
	Recall 6	0	5 (16.1%)	0.052
	Recall 7	0	7 (22.6%)	0.01
	Recall 8	0	7 (22.6%)	0.01
	Recall 9	0	2 (6.2%)	0.211
	Recall 10	0	2 (6.5%)	0.213

*: statistically significant as p value <0.05.

Table 5: Correlation between IOWA score and other variables

	Kandall's tau_b	P value
Age	0.376	**0.02***
Weight	-0.203	0.186
Height	0.118	0.442
BMI	-0.176	0.241
MAP_ Pre	0.007	0.962
MAP_ After	-0.177	0.248
Midazolam consumption	-0.446	**0.007***
Fentanyl consumption	-0.492	**0.003***
Duration of surgery	0.193	0.211
Midazolam consumption(mg)	-0.219	0.175
Fentanyl to ISAS started(min.)	-0.247	0.127
Midazolam to phone call (hrs.)	0.147	0.346
Duration in recovery room(min.)	0.149	0.344
Duration of phone call(min.)	0.225	0.166

*: statistically significant as p value <0.05.

Discussion

Cataract surgery is usually associated with minimal pain when employing topical or regional anesthesia. Patient education regarding the peri-operative process may help alleviate anxiety and avoid the need for sedation. However, sedation may be required. Many consider that pre-operative fasting is necessary due to the risk of aspiration but fasting may not be required if minimal sedation is administered. If the use of sedatives, hypnotics or analgesics is required, then their associated adverse events should be considered (10).

In our study, group I included 13 (41.9%) males and 18 (58.1%) females versus 45.2% & 54.8% of group II respectively, their age ranged from 50 to 79 years with a mean of 66.04±10.14 years & 64.3± 9.34. The weight of the studied patients ranged from 65 to 91 kg, the height ranged from 1.59 to 1.75m, and the BMI ranged from 22 to 32 Kg/m2 with a mean of 26.82±2.83 & 25.5±3.44 Kg/m2 respectively. Regarding the American Society of Anesthesiologists (ASA) physical status, 14 (45.2%) patients had ASA II and 17

(54.8%) patients of group I had ASA III versus 48.4% & 51.6% of group II.

In accordance with us, Gokalp and Ozbeyaz (11) carried out a study included 177 patients; 92 (52%) were male. The mean age was calculated to be 67.52 ± 7.71 years. The mean BMI was 26.7± 5.6 kg/m2.

In the current study, regarding the vital signs of group I studied patients, HR at baseline ranged from 71 to 90 (bpm) with a mean of 80 ± 5.61 (bpm), after 10 min. HR ranged from 54 to105 (bpm) with a mean of 78.6 ± 11.97 versus 82.3±4.32 (bpm) & 79.4±9.22 (bpm) respectively. MAP of studied group I patients at baseline ranged from 60 to 90 (mmHg) with a mean of 74.6 ± 9.32, after 10 min MAP ranged from 65 to 90

(mmHg) with a mean of 77 ± 6.67 versus 76.3±8.43 (mmHg) & 77.9±7.65 (mmHg) of group II respectively. The duration of surgery was 18.8 ± 4.86 min versus 20.1±3.45 min among group I & II respectively. The median dose of fentanyl consumption was 25 (25-50) mg among both groups, and the median dose of midazolam consumption was 1.5 (1-2).

In agreement with us, Chadha et al (9) reported that the duration of surgery ranged from 13 to 27 (min), the duration in the recovery room ranged from 14 to 23 (min), and the duration of phone call ranged from 3 to 4 (min). The median dose of fentanyl consumption was 25 (25-50) mg, and the median dose of midazolam consumption was 1 (0.75-1).

As regard to our results, the studied patients of group I (received fentanyl & midazolam) had the "I felt pain" score ranged from -1 to 3 with a mean of 2.1 ± 1.33, the "I felt pain during surgery" score ranged from -1 to 3 with a mean of 2.4 ± 1.11, the "I was too cold or too hot" score ranged from 0 to 3 with a mean of 2.9 ± 0.6, the "I would want to have same aesthesia" score ranged from -3 to 1 with a mean of -2.2 ± 1.38, the "I throw up or felt like throwing" score ranged from -1 to 3with a mean of 1.8 ± 1.32, The "I itched" score ranged from -2 to 3 with a mean of 2.1 ± 1.33, The "I felt relaxed" score ranged from -3 to 2 with a mean of -1.7 ± 1.46, the "I felt safe" score ranged from -3 to -1with a mean of -2.6 ± 0.64, the "I felt good" score ranged from -3 to 0 with a mean of -2.3 ± 0.85, The "I hurt" score ranged from -2 to 3with a mean of 2.1 ± 1.42 and the "I was satisfied with my anesthesia" score ranged from -3 to 1 with a mean of -2.2 ± 1.13, all that items were significantly better among group I than group II. The median IOWA total score was 3 (2-3) among group I cases versus 4 (3-4) of group II cases.

In parallel with us, Moritz et al (12) conducted a cross-sectional study, involving 127 adult individuals undergoing ambulatory surgeries with moderate/deep sedation to cross-culturally adapt the ISAS instrument and evaluate the acceptability, validity, and reliability of the proposed Brazilian version (ISAS-Br). The mean total score of ISAS-Br was 2.59 (SD = 0.54) with a range of -0.27 to 3.0.

In the current study, sedation to ISAS started ranged from 27 to 48 (min) with a mean of 32.6±4.18, sedation to phone call ranged from 22 to 49 (mins) with a mean of 35.6±5.22 among group I patients versus 48.2±9.24 min & 24.5±2.45 min in group II patients respectively.

In agreement with us, Chadha et al (9) reported that fentanyl to ISAS started ranged from 28 to 34 (min) with a median of 32, midazolam to ISAS ranged from 29 to 34 (min) with a median of 32, and midazolam to phone call ranged from 21.8 to 26 (hours) with a median of 24.4.

According to our findings, 15 (48.4%) patients recalled 0 theme, 7 (22.6%)

patients recall 1 theme, 5 (16.1%) patients recalled 2 themes, and 4 (12.9%) patients recalled 3 themes among group I cases, while in group II, there was no one recalled 0, 1 or 2 themes with significant difference among both groups, only one patient (3.2%) who recalled 3 themes, 2 (6.5%) patients recalled 4 themes, 5 (16.1%) patients recall 5 themes, 5 (16.1%) patients recalled 6 themes, and 7 (22.6%) patients recalled 7 & 8 themes for each and two patients (6.5%) recalled for both 9 & 10 themes.

In agreement with us, Chadha et al (9)found that among the 20 patients studied, 11 recalled 0 themes, 4 recalled 1 theme, 4 recalled 2 themes, and 1 recalled 3 themes. Thus, among the 20 patients, 15 (75%) recalled 0 or 1 of the 11 themes (P = 0.021 versus half the patients). The 95% one-sided lower confidence limit for recall of 0 or 1 themes was 55% of patients. Among the 20 patients, 19 (95%) recalled 0, 1, or 2 of the 11 items. The 95% one-sided lower confidence limit for 0, 1, or 2 themes was 80% of patients (P < 0.001 versus half). The 19/20 was comparable to the 10/10 patients observed in our pilot (Fisher's exact test P = 0.99). All 5 patients who recalled 2 or 3 Iowa Satisfaction with Anesthesia Scale themes also correctly recalled the eye patch instructions. There were 5 patients who both recalled 0 or 1 theme and incorrectly recalled the eye patch instructions. The other 10 patients recalled 0 or 1 theme but remembered the eye patch instructions correctly. Thus, the total of 15 of 20 patients who recalled the eye patch instructions was significantly greater pairwise than the 5 of 20 patients who recalled 2 or 3 themes (P < 0.001).

In the present study, there was a positive significant correlation between IOWA score and age, while there was a negative significant correlation between IOWA score and midazolam consumption and fentanyl consumption.

In agreement with us**,** Chadha et al., (9) found that there was a negative significant correlation between IOWA score and midazolam consumption and fentanyl consumption (p=0.039, p=0.024 respectively). However, there was no correlation between IOWA score and age (p=0.99). That finding complements results from Chen et al (13) who found that increasing doses of midazolam administered in the preoperative holding area were associated with greater incidences of complete amnesia of operating room events.

Limitations: small sample size and lack of control group.

Therefore, larger cohorts and the presence of a control group are recommended to validate our findings.

Conclusion

Our study revealed that the addition of midazolam dose to the sedation plan would improve the Iowa Satisfaction with Anesthesia Scale and was

associated with recall of fewer themes from this scale.

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