Journal of Chemical Health Risks

www.jchr.org

JCHR (2023) 13(4s), 01-09 | ISSN:2251-6727

Comparative Effect of Oral Pregabalin, Intravenous Fentanyl, And Dexmedetomidine During Abdominal Surgeries

[1]Dr. Mrs. N. V., [2]Dr. V. S. Kapurkar, [3]Dr. V. M. Joshi

[1]Kanase, Professor, Department of Anaesthesiology, Krishna Vishwa Vidyapeeth, Karad, Maharashtra, India,

[2]Associate Professor, Department of Anaesthesiology, Krishna Vishwa Vidyapeeth, Karad, Maharashtra, India

[3]Associate Professor, Department of Anaesthesiology, Krishna Vishwa Vidyapeeth, Karad, Maharashtra, India,

KEYWORDS

LSAS, intra-OP, posto-OP analgesic, sedation, P, F, Dexdos, Ringer's solution, RSS

ABSTRACT:

According to various past studies ,the most important aspect of anaesthesia for a better patient outcome is pre-OP sedation and CV stability during induction, LS, I and during the surgical process.Hence, in our study we have assessed the effects of P 150mg, IV F 2µg/kg, and IV Dexdos 0.25µg/kg during LS and ET-I in AS.Following IEC approval, 60 ASA physical status I and II patients aged 20–60 of both genders undergoing elective LS AS under GA were randomly assigned to two groups. While group B (n = 30) received oral P 150mg, IV F 2 g/kg, and IV Dexdos 0.25 g/kg as a 2-min infusion and group A (n = 30) received oral P 150mg with IV F 2 g/kg. .Before anesthesia, a comprehensive investigation was done. Before entering the OT, the patient received lactated Ringer's solution through a 20G cannula in their non-dominant hand's dorsum. Additionally, baseline parameters included HR,SBP,DBP, MABP, and SpO2 and RSS was used to assess patients' level of sedation prior to study medication administration and prior to intubation. We found that, the incidence of post-OP analgesic requirements was similar in both groups. We come to conclude that low-dose IV dexdos (0.25 µg/kg) efficiently reduced RR compared to Group A. Additionally, it improved sedation prior to I and reduced the pre-LG pressure response in LSAS. However, when compared to Group A, it did not increase intra-OP and posto-OP analgesic requirements.

INTRODUCTION

Since the first direct vision investigation of the human larynx by Albert Kirstein in 1895 and its subsequent modification to include the insertion of endotracheal tubes by Chevalier Jackson in 1913, laryngoscopy and endotracheal intubation have been regarded as crucial steps in the management of the airway.[1,2] Reid and Brace recorded the circulatory responses to airway instrumentation in 1940.[3] In 1910, Swedish physician Hans Christian Jacobaeus executed the first laparoscopic operation.[4] Laparoscopic surgeries are an integral part of modern surgical practice, with added advantages such as smaller incisions, less postoperative pain, excellent cosmetic outcomes, early ambulation, recovery, and discharge. Carbon dioxide is the most frequently used insufflation agent; however, it poses risks due to increased intra-abdominal pressure, which predictably leads to increased hemodynamic responses. Critically ailing elderly patients are also undergoing advanced laparoscopic surgeries, which can increase the risk of anesthesia. Pneumoperitoneum necessitates optimal preconception and intraoperative care due to the hemodynamic response. This study seeks to determine the most effective drug dose required to attenuate the hemodynamic pressure response, despite the fact that numerous other studies have utilized various drugs and methods for this purpose. Instrumentation of the airway can induce a pressor response, which comprises a spectrum of responses that result in increased sympathetic activity and can lead to an increase in plasma catecholamines.[5] Hence, the goal of our study was to evaluate and compare the effects of oral

pregabalin (P) 150mg , IV fentanyl (F) 2µg/kg vs. oral P 150mg, IV (F) 2µg/kg, and IV dexmedetomidine (Dexdos) 0.25µg/kg during laryngoscopy (LS) and endotracheal intubation (ET-I) in abdominal surgeries(AS).

AIM

To evaluate & compare the effects of oral (P) + IV (F) with oral (P) +IV (F) +IV (Dexdos) during LS & ET-I in AS.

INCLUSION CRITERIA

1. Age group 20-60 years.
2. Patients belonging to ASA physical status I & II.
3. Both genders female & male were included.

EXCLUSION CRITERIA

1. H/o of drug abuse
2. H/o use of regular analgesic
3. H/o chronic pain
4. H/o of HTN, DM, Impared liver(IL) or Kidney function(KF)
5. Emergency surgery
6. Known hypersensitivity to study drugs
7. Inability to verbally express severity of pain
8. Neurological deficit
9. Pregnancy

MATERIALS & METHOD

We conducted a prospective,comparative , randomized, double-blind clinical study at KH, Karad, starting in October 2017 and ending in May 2019, with a total of 60 patients.

DATA COLLECTION

After IEC approval, 60 patients aged between 20 and 60 years of both genders belonging to ASA physical status I and II undergoing elective LS AS under GA were randomly divided into 2 groups. Whereas group A (n = 30) received oral P 150mg (1 hour prior to surgery) and IV F 12 g/kg (premedication 10 min prior to surgery), while group B (n = 30) received oral P (1 hour prior to surgery), IV F 2 g/kg, and IV Dexdos 0.25 g/kg as a 2-minute infusion (premedication 10 min prior to surgery).Furthermore, pre-anaesthetic evaluation involves complete haemogram, BT, CT, RBS,KFT, serum electrolyte, URA, X-ray chest PA view & ECG. Furthermore, in accordance with ASA recommendations, patients were given no oral nutrition. No analgesics were given to patients within 12 hours before surgery. The patient had a 20G cannula put into a vein on the dorsum of their non-dominant hand before entering the operating room, and lactated Ringer's solution was administered. HR,SBP,DBP, MABP, and SpO2 were recorded as baseline vital signs. Before delivering study medications and prior to intubation, the patients' level of sedation was measured using the Ramsay sedation scale (RSS).

SCORE	RESPONSE
1	Anxious, agitated or restless
2	Cooperative, oriented and tranquil
3	Respond to command
4	Asleep with brisk response to stimulus
5	Asleep with sluggish response to stimulus
6	Asleep with no response.

Table 1: Ramsay Sedation Score

Journal of Chemical Health Risks
www.jchr.org
JCHR (2023) 13(4s), 01-09 | ISSN:2251-6727

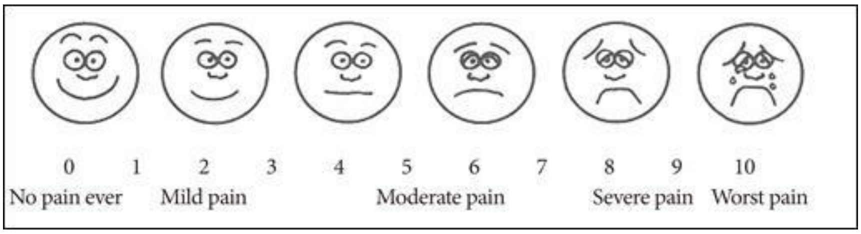

Figure 1: Visual Analogue Scale

STASTICAL ANALYSIS

Data entry and analysis were performed using Microsoft Excel 2007 and SPSS 20.0 software tools. The number and frequency (%) of cases served as indicators of the categorical factors. Measures of central frequency (such as mean) and deviation were used to analyze the continuous variables. The unpaired student's t-test, the Mann-Whitney U test, the one-way analysis of variance, and the general linear model for repeated measures were used for statistical analysis. To be statistically significant, a p-value less than 0.05 was required.

RESULT

GENDER	GROUP A		GROUP B	
	NO	%	NO	%
MALE	8	26.67	10	33.33
FEMALE	22	73.33	20	66.67
TOTAL	30	100	30	100

Table 2: Gender-wise distribution

In our study, we found a predominance of female gender as compared to male gender in both groups.

AGE (years)	GROUP A	GROUP B
20-29	15	15
30-39	7	8
40-49	6	3
50-59	2	4
TOTAL	30	30
MEAN +- SD	33.07 +- 10.43	32.16 +-10.91

Table 3: Age-wise distribution

In our study, we found the predominant age group in both groups was between 20 and 29 years old. The mean ages in groups A and B were 33.07 years and 32.16 years, respectively. Both groups are comparable in distribution.

Journal of Chemical Health Risks
www.jchr.org
JCHR (2023) 13(4s), 01-09 | ISSN:2251-6727

BMI (kg/m^2)	GROUP A	GROUP B
14-19	3	1
19-25	27	29
TOTAL	30	30
MEAN	21.92	22.1

Table 4: BMI distribution

In our study, we found that there is no significant difference in the BMI distribution between the two groups, with patients being in the normal range, which is predominant in both groups.

ASA GRADE	GROUP A	GROUP B
ASA I	26	26
ASA II	4	4

Table 5: ASA distribution

In our study, we found that the predominant ASA physical status was Grade I in both groups.

SEDATION	BEFORE PRE-MEDICATION		PRIOR TO INTUBATION	
	GROUP A	GROUP B	GROUP A	GROUP B
RAMSAY 1	17	15	0	0
RAMSAY 2	13	15	23	15
RAMSAY 3	0	0	7	15
TOTAL	30	30	30	30

Table 6: RSS

In our study, we found that the change in the Ramsay Sedation Score prior to intubation was greater in Group B as compared to Group A. After giving premedication in Group A, 76% (23/30) had a sedation score of 2 and 24% had a sedation score of 3, while in Group B, 50% (15/30) had a sedation score of 2 and the remaining 50% had a sedation score of 3. The session score was comparable in both groups.

Journal of Chemical Health Risks
www.jchr.org
JCHR (2023) 13(4s), 01-09 | ISSN:2251-6727

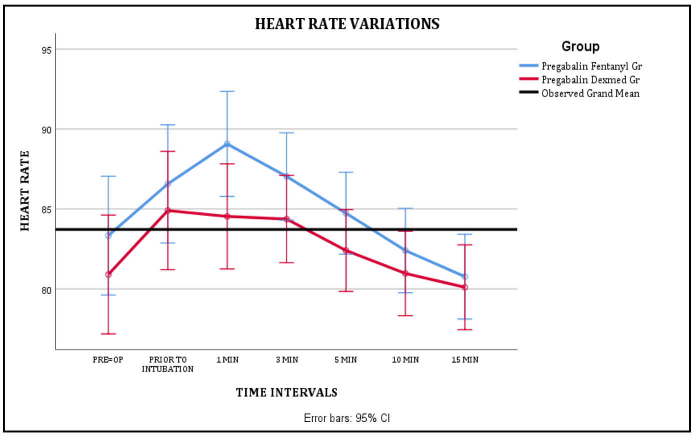

Figure 2: Variation in HR

In our study we found that, HRV preoperatively, prior to intubation, followed by 1, 3, 5, 10, and 15 minutes after intubation in both groups. The HRV was not statistically significant in both groups. The overall heart rate mean difference was 2.248 bpm with a 95% CI of 1.675–6.170 bpm and P-value of 0.256. (GLM for repeated measures). When a 20% increase in HR was considered, there were 6 patients in Group A and one patient in Group B who had a 20% increase in HR.

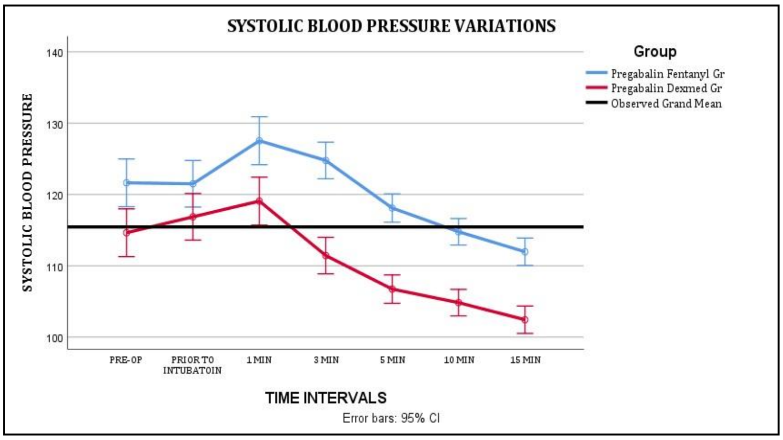

Figure 3: Variation in SBP

In our study, we found that, SBP variation pre-OP, prior to intubation, was followed by intervals of 1, 3, 5, 10, and 15 minutes after intubation in both the groups.The variation in SBP was significantly higher in Group B pre-OP (P-value of 0.004 and 95% CI of 2.267 – 11.731 mmHg), prior to intubation (P-value of 0.049 and 95% CI of 0.022 – 9.245 mmHg), 1 min after intubation (P-value of 0.001 and 95% CI of 3.715 – 13.219 mmHg), 3 min after intubation (P-value of 0.000 and 95% CI of 9.172 – 16.954 mmHg), 5 min after intubation (P-value of 0.000 and 95% CI of 8.560 – 14.173 mmHg), 10 min after intubation (P-value of 0.000 and 95% CI of 7.304 – 12.563 mmHg) and 15 min after intubation (P-value of 0.000 and 95% CI of 6.813 – 12.253 mmHg) as compared to Group A. The overall SBP mean difference was 9.181 mmHg, with a 95% CI of 6.309–12.053 mmHg and a P-value of 0.000. (GLM for RM).

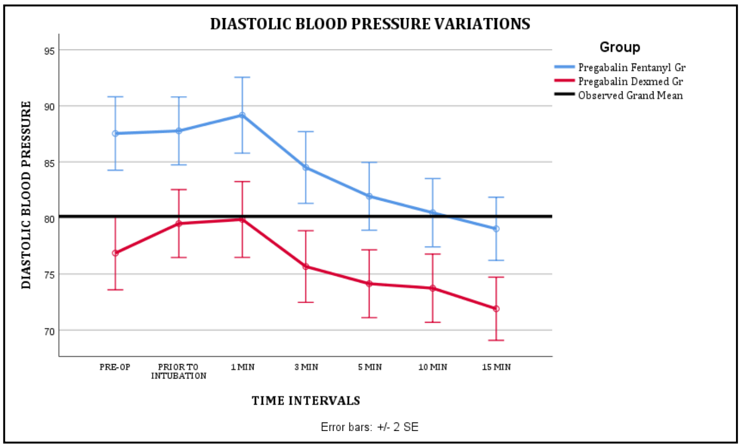

Figure 4: Variation in DBP

In our study, we found that, DBP variation pre-OP, prior to intubation, followed by intervals of 1, 3, 5, 10 and 15 min after intubation in both the groups.The variation in DBP was significantly higher in Group B pre-OP (P-value of 0.000 and 95% CI of 6.031 – 15.303 mmHg), prior to intubation (P-value of 0.000 and 95% CI of 3.979 – 12.554 mmHg), 1 min after intubation (P-value of 0.000 and 95% CI of 4.510 – 14.090 mmHg), 3 min after intubation (P-value of and 95% CI of 307 – 13.360 mmHg), 5 min after intubation (P-value of and 95% CI of 517 – 12.083 mmHg), 10 min after intubation (P-value of 0.003 and 95% CI of 2.421 – 11.045 mmHg) and 15 min after intubation (P-value of 0.001 and 95% CI of 3.144 – 11.123 mmHg) as compared to Group A. The overall DBP mean difference was 8.390 mmHg with 95% CI of 4.238 – 12.543 mmHg and P- value of 0.000. (GLM for RM).

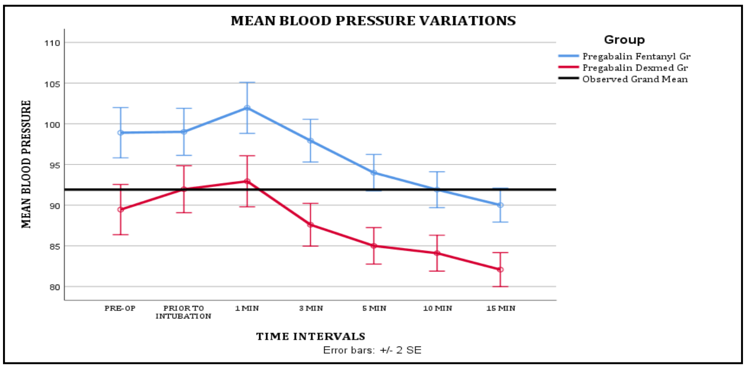

Figure 5: Variation in MBP

In our study, we found that MBP variation pre-OP, prior to intubation, was followed by intervals of 1, 3, 5, 10, and 15 minutes after intubation in both groups. The variation in MBP was significantly higher in Group B pre-OP (P-value of = 0.000 and 95% CI of 5.069 – 13.820 mmHg), prior to intubation (P-value of 0.001 and 95% CI of 2.967 – 11.144 mmHg), 1 min after intubation (P-value of 0.000 and 95% CI of 4.587 – 13.457 mmHg), 3 min after intubation (P-value of 0.000 and 95% CI of 6.619 – 14.048 mmHg), 5 min after intubation (P-value of 0.000 and 95% CI of 5.815 – 12.163 mmHg), 10 min after intubation (P-value of 0.000 and 95% CI of 4.676 – 10.924 mmHg), and 15 min after intubation (P-value of 0.000 and 95% CI of 4.975 – 10.891 mmHg) as compared to Group A. The overall mean difference was 8.654 mmHg with 95% CI of 5.182 – 12.126 mmHg and P-value of 0.000. (Glm for RM).

Journal of Chemical Health Risks
www.jchr.org
JCHR (2023) 13(4s), 01-09 | ISSN:2251-6727

FREQUENCY	TOTAL NO. OF PATIENTS	
	GROUP A	GROUP B
0	23	25
1	3	3
2	4	2
TOTAL	30	30

Table 7: Intra-OP (F) Requirement

In our study, we found that the frequency of intra-OP F top-ups was similar in both groups.

FREQUENCY	TOTAL NO. OF PATIENTS	
	GROUP A	GROUP B
0	0	0
1	24	25
2	6	5
3	0	0

Table 8: Post-OP Analgesic Requirement

In our study, we found that the frequency of post-OP analgesic requirements was similar in both groups.

DISCUSSION

In our study we found that , demographic factors were similar between groups. Dexdos improved sedation before intubation, according to the RSS. At a low dose of 0.25 µg/kg, dexdos,P, and F can reduce the rate and pressure response to LS and intubation(I). There was effective attenuation of F and rate response when pregabalin was coupled with F alone, but not pressure response. Prior to I, 1, 3, 5, 10, and 15 min after I, Group B's MBP was considerably lower than Group A's.The MBP difference was 8.65 mmHg (95% CI: 5.182–12.126) and P-value = 0.000.Both groups had non-significant HRV. The MHR difference was 2.248 bpm (95% CI: 1.675–6.170 bpm, P=0.256). The study found that low-dose IV dexdes 0.25µg/kg successfully reduced rate response, as seen by a flatter slope (Figure 2) compared to Group A. Additionally, it improved sedation prior to intubation and reduced the P response to LS and I in LS (AP). However, as compared to Group A, it did not increase the need for intra-OP and post-OP analgesics. Patients' anxiety levels may rise if they are conscious during regional anesthesia. To reduce anxiety and worry before surgery, various methods have been implemented. Pharmacological methods like premedication and intraoperative sedation have been implemented in various locations, as well as a warm and welcoming hospital environment and appropriate information and communication on the anesthesia and sedation course. The anxiety of surgical patients has also been shown to be lessened by music therapy.[6] Another study done by Gupta et al.[7] and Salman et al.[8] found that there was no significant change in HR with P 150mg and F 1µg/kg as compared to placebo, which was similar to our study. However, we did not include a placebo group in our study.Raichurkar et al.[9] found that the MHR following LS and I among the groups receiving clonidine was less than among the group receiving P and was statistically significant at 1 min and 3 min. Whereas, in our study, there were 6 patients in Group A as compared to one patient in Group B who had a >20% increase in HR from the baseline. This could be explained by the fact that Raichurkar et al used a higher dose of 2.5µg/kg of F as premedication, and P was given 90 min prior to surgery. Another study done by Hazra et al.[10] concluded that SBP, BDP, and MAP were significantly lower with dexdos. Keniya et al.[11] observed that a maximal increase in BP occurred immediately after tracheal I when compared to the baseline MBP. Here, another team of reseachers found that there is significant reduction in BP

Journal of Chemical Health Risks
www.jchr.org
JCHR (2023) 13(4s), 01-09 | ISSN:2251-6727

with 0.6μg/kg dexdos, SBP and DBP at the time of I.[12] Another study done by Smitha et al.compared 2 doses of dexdos and found that SBP, DBP, and MAP were statistically lower at all time intervals, especially 1 min after I with dexdos (1μg/kg) when compared to 0.5μg/kg. When a dose of 1μg/kg was used, there was better control of BP than 0.5μg/kg, which was in turn significantly better than placebo.[13]

Henceforth, in our study we found that, after giving 0.25 μg/kg of dexdox IV with P and F decreased the R and P responses to LS and I more than giving it alone. When combined with F alone, P reduced P response but not R response. Dexdos also provided improved sedation prior to I, as measured by the RSS. Both groups showed intra-OP F top-ups and post-OP analgesic requirements. Furthermore, IV dexdos 0.25 g/kg slowed the HR and P responses to LS and I before LSAP. It did not increase the requirement for intra-OP and post-OP analgesia. Thus,combination of P,F, and dexdos did not potentiate post-OP analgesic requirements when compared to P and F.

LIMITATION OF THE STUDY

1. We did not investigated further for occurrence of coughor any other airway reflexes.
2. Dose of IV induction & inhalational agents was subjective.
3. Measurements of plasma catecholamine level which was more objective means of haemodynamic response was not done because of laboratory restrictions.
4. Measurement of time to recover folloeing extubation was not done.

CONCLUSION

We come to the conclusion that low-dose intravenous dexmedetomidine 0.25 μg/kg could effectively blunt the RR, as compared to Group A. Also, it blunted the BP to laryngoscopy and intubation in LSAS and offered better sedation prior to intubation. However, it did not potentiate intra-OP and post-OP analgesic requirements as compared to Group A.

REFERENCE

1. Menges Jr JE, Crown LA. Doctor, which type of blade do you want to use now? A Brief History and Review of Direct Laryngoscopy and Laryngoscope Blades. Am J Clin Med. 2005;2(2):15-8.
2. Levitan RM, Kush S, Hollander JE. Devices for difficult airway management in academic emergency departments: Results of a national survery. Annals of emergency medicine. 1999 Jun 1;33(6):694-8.
3. Reid LC, Brace DE. Irritation of the respiratory tract and its reflex effect upon heart. Surg Gynecol Obstet. 1940 Feb;70:157-62.
4. Hatzinger M, Kwon ST, Langbein S, Kamp S, Häcker A, Alken P. Hans Christian Jacobaeus: Inventor of human laparoscopy and thoracoscopy. Journal of endourology. 2006 Nov 1;20(11):848-50.
5. Derbyshire DR, Chmielewski A, Fell D, Vater M, Achola K, Smith G. Plasma catecholamine responses to tracheal intubation. BJA: British Journal of Anaesthesia. 1983 Sep 1;55(9):855-60.
6. Augustin P, Hains AA. Effect of music on ambulatory surgery patients' preoperative anxiety. AORN journal. 1996 Apr 1;63(4):750-8.
7. Gupta K, Bansal P, Gupta PK, Singh YP. Pregabalin premedication-A new treatment option for hemodynamic stability during general anesthesia: A prospective study. Anesthesia, essays and researches. 2011 Jan;5(1):57.
8. Salman E, Celik C, Candan S. Premedication with single dose pregabalin 150 mg attenuates hemodynamic response to laryngoscopy and intubation. Research Articl. 2012;1(05).
9. Raichurkar A, Dinesh K, Ravi M, Talikoti AT, Somasekharam P. A comparative study of oral pregabalin and clonidine for attenuation of hemodynamic responses to laryngoscopy and tracheal intubation. J Clin Biomed Sci. 2015;5(1):25-9.
10. Hazra R, Manjunatha SM, Manuar B, Basu R, Chakraborty S. Comparison of the effects of intravenously administered dexmedetomidine with clonidine on hemodynamic responses during laparoscopic cholecystectomy. Anaesthesia, Pain & Intensive Care. 2014 Jan 1;18(1).
11. Keniya VM, Ladi S, Naphade R. Dexmedetomidine attenuates sympathoadrenal response to tracheal intubation and reduces perioperative anaesthetic requirement. Indian journal of anaesthesia. 2011 Jul;55(4):352.

Journal of Chemical Health Risks
www.jchr.org
JCHR (2023) 13(4s), 01-09 | ISSN:2251-6727

12. Jaakola ML, Ali-Melkkilä T, Kanto J, Kallio A, Scheinin H, Scheinin M. Dexmedetomidine reduces intraocular pressure, intubation reponses and anaesthetic requirements in patients undergoing ophthalmic surgery. British journal of anaesthesia. 1992 Jun 1;68(6):570-5.
13. Smitha KS, Shukla D, Sathesha M, Rao R, Nethra SS, Sudheesh K. Comparison of two different doses of dexmedetomidine in attenuating hemodynamic changes during laryngoscopy. Journal of Evolution of Medical and Dental Sciences. 2014 Nov 13;3(61):13501-9.