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A COMPARATIVE OBSERVATIONAL STUDY BETWEEN DEXMEDETOMIDINE AND FENTANYL TO MITIGATE THE INTUBATION RESPONSE IN GYNAECOLOGICAL RELATEDOPERATIONS

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ABSTRACT

Anesthesia involves the controlled, temporary loss of sensation or consciousness, primarily for medical procedures. It encompasses analgesia, paralysis, amnesia, and unconsciousness. Intubation, specifically tracheal intubation, is a procedure that involves inserting a tube into the trachea to maintain an open airway or administer medication. This procedure can trigger an "intubation response," a reflex sympathetic reaction causing an increase in heart rate, pulse, and blood pressure due to a surge in catecholamines. This study aimed to compare the efficacy of Dexmedetomidine (0.5 mcg/kg) and Fentanyl (1.5 mcg/kg) in attenuating the hemodynamic response during intubation in patients undergoing gynecological surgeries. Secondary objectives included evaluating changes in heart rate, blood pressure, oxygen saturation, and respiratory rate. The study, conducted over six months at Medicover Women and Child Hospital in Hyderabad,

included 40 patients. Data were collected on heart rate, blood pressure,oxygen saturation, and respiratory rate before and after intubation. Results showed that both Dexmedetomidine and Fentanyl were effective in reducing the hemodynamic response to intubation. However, Dexmedetomidine was found to be superior to Fentanyl in attenuating this response. Thus, Dexmedetomidine 0.5 mcg/kg is recommended over Fentanyl 1.5 mcg/kg for managing hemodynamic changes during laryngoscopy and intubation.

KEYWORDS: Intubation, Mitigate, Dexmedetomidine, Fentanyl.

INTRODUCTION

A medical technique called intubation [Tracheal intubation] involves inserting a tube into the patient's body, it is the insertion of a flexible silicon tube into the trachea in order to keep the airway open or act as a conduit for the delivery of medication. A reflex sympathetic reaction to the mechanical stimulation of the larynx and trachea is thought to be the known as Intubation response this comprises of increase in the heart rate, pulse rate, blood pressure due to catecholamine's surge in the blood. Intubation and direct laryngoscopy cause a 20–27% and 30– 50% rise in heart rate and blood pressure, respectively.

STUDY OBJECTIVES

Primary Objective:• To compare the efficacy of Dexmedetomidine (0.5 mcg/kg) and Fentanyl (1.5 mcg/kg) in attenuating the hemodynamic response to laryngoscopy and tracheal intubation in patients undergoing gynecological surgeries.

Secondary Objectives

- To assess the changes in heart rate, pulse rate, systolic blood pressure, diastolic blood pressure, and mean arterial pressure following intubation in patients receiving Dexmedetomidine and Fentanyl.
- To evaluate the effect of Dexmedetomidine and Fentanyl on oxygen saturation (SpO2) levels at five- and ten-minutes post-intubation.
- To compare the respiratory rate changes in patients administered Dexmedetomidine versus Fentanyl during intubation.
- To investigate any significant differences in patient outcomes related to intubation response between the two drugs.

MATERIALS AND METHODS

This study is to examine whether administration of dexmedetomidine and fentanyl to a commonly administered balanced anesthetic regimen improves the perioperative hemodynamic stability and to mitigate intubation response in patients undergoing major gynecological surgical procedures at hospitals during the course of study. Statistical Methods used will be ANOVA or Paired T-test. This comes under cross sectional prospective observational study. The study will be done after getting permission to enter into operation theatre and then monitor vital during pre-operation, induction, intubation of the patient. All the eligible patients' details will be collected in data collection form which includes demographics data such as: age, gender, weight along with following laboratory parameters also:

- Heart rate, pulse rate, systolic blood pressure and diastolic blood pressure, and mean arterial pressure.
- SpO2 levels at five and ten minutes. • Respiratory rate

STUDY DESIGN: a cross sectional prospective observational study

STUDY SITE: Medicover hospitals, Hitech city, Hyderabad. DURATION OF STUDY: Data will be collected at Medicover hospitals women and children from department of Anesthesia that fit in the inclusive criteria who have been admitted in the hospital for the surgeries, durationof study will be for the period of six months.

STUDY POPULATION: Sample size – 20-40 Patients

STUDY CRITERIA

A. INCLUSIVE CRITERIA

- Patients belonging to ASA grade 1 and 2
- Patients undergoing gynecological surgeries

B. EXCLUSIVE CRITERIA

1. Pregnant and nursing women are excluded.
2. Patients with morbid obesity (BMI > 25), heart block, uncontrolled hypertensive patients who are with severe cardio vascular disease, diabetes and renal disease patients are not included. STUDY MATERIAL: All the relevant data will be obtained from the department after getting required permissions from the Ethical Committee of The Hospital.

STATISTICAL ANALYSIS: The obtained data will be entered in MS EXCEL sheet. Quantitative variables will be summarized using descriptive statistics (number of observations, percentages, mean, standard deviation {SD}. The data will be statistically analyzed using statistical package for the social sciences (SPSS) software and will be represented as graphs or pie diagram or bar graph. All the required outputs and responses will be collected from the hospital.

RESULTS AND DISCUSSION

-Total 30 patients were enrolled in this study.

-None of the patient had laryngoscopy duration >15 secs and multiple attempts.

-Demographic profile including age, sex, weight, ASA physical status,

-Number of patients with co morbidities i.e patients belonging to ASA GRADE 2 - 15 MEMBERS Patients age group:

All the patients were above 25 years of age

- 25 – 40 : 12
- 40 -50 : 10
- 50 -65 : 8
- Above 65 : 1

The preoperative baseline hemodynamic parameters like mean HR, SBP, DBP, SPO2 in Group D and in GroupF were also comparable between two groups.

Comparison using Student t-test

Table 1: Comparison of heart rate between fentanyl and dexmedetomidine group p – value.

Parameter	group F	group D	p-value
HR baseline	69.21±7.69	77.13±8.57	0.067657
HR 5 min of infusion	73.665±7.585	76.005±8.45	0.222855
HR after induction	75.51±8.39	75.195±8.3	0.346177
HR during intubation	92.205 ±10.245	82.08±9.12	0.043583
HR 2 min afterintubation	86.175±9.575	80.01±8.89	0.185313
HR 5 min afterintubation	82.035±9.115	74.07±8.23	0.041379

Heart Rate base line was ± 69.21 mm Hg in Group F and ± 77.13 mm Hg in Group D and post intubation Group D was ± 74.68 mm Hg and Group F was ± 82.035 mm Hg.

Significantly there is a less increase in Heart rate in Dexmedetomidine group compared to Fentanyl Group post intubation

Table 2: Comparison of SBP (mmHg) between Fentanyl and Dexmedetomidine group.

Parameter	group F	group D	p-value
SBP baseline	105.3±11.7	110.07±12.23	0.28
SBP 5 min of infusion	108.585±12.065	109.89±12.21	0.85
SBP after induction	77.94±8.66	97.83±10.87	0.00
SBP 1min after intubation	101.52±11.28	104.31±11.59	0.69
SBP 2 min after intubation	98.235±10.915	102.015±11.335	0.55
SBP 5 min after intubation	93.51±10.39	100.485±11.205	0.09

Systolic blood pressure base line was ± 105.68 mm Hg in Group D and ± 110.68 mm Hg in Group F and post intubation Group D was ± 93.68 mm Hg and Group F was ± 100.68 mm Hg. Significantly the systolic blood pressure was less in Dexmedetomidine group compared to Fentanyl Group.

Table 3: Comparison of DBP (mmHg) between Fentanyl and Dexmedetomidine group.

Parameter	group F	group D	p-value
DBP baseline	68.715±7.635	71.235±7.915	0.323192
DBP 5 min of infusion	70.38±7.82	75.78±8.42	0.063284
DBP after induction	53.82±5.98	62.82±6.98	0.049764
DBP 1min after intubation	67.23±7.47	69.57±7.73	0.657848
DBP 2 min after intubation	66.96±7.44	70.11±7.79	0.528635
DBP 5 min after intubation	64.53±7.17	63.72±7.08	0.878747

Diastolic blood pressure baseline was 68.23±7.47 mm Hg in Group D and 71.57±7.73 mm Hg in Group F and 66.96±7.44mm Hg in Group D and 70.11±7.79 mm Hg in Group F post intubation.

Differences in both, systolic and diastolic blood pressure at post intubation of dexmedetomidine were statistically significant. So, after post intubation the rise of both SBP and DBP was slightly less in Group D.

Table 4: Comparison of MAP (mmHg) between Fentanyl and Dexmedetomidine group.

Parameter	group F	group D	p-value
DBP baseline	76.545±8.505	79.335±8.815	0.383
DBP 5 min of infusion	78.525±8.725	85.14±9.46	0.048
DBP after induction	65.52±7.28	74.34±8.26	0.002
DBP 1min after intubation	74.295±8.225	79.515±8.835	0.323
DBP 2 min after intubation	74.97±8.33	79.65±8.85	0.349
DBP 5 min afterintubation	73.89±8.21	77.76±8.64	0.344

Mean arterial pressure baseline was 76.545±7.47 mm Hg in Group D and 79.335±7.73 mm Hg in Group F and 73.89±7.44mm Hg in Group D and 77.76±7.79 mm Hg in Group F post intubation.

Group D had an edge over Group F as it has lesser side effect and longer duration action compared to Group F, which was statistically significant without causing any increased adverse effects.

CONCLUSION

1. Tracheal intubation is associated with an increase in arterial pressure, heart rate and plasmacatecholamine concentrations.
2. Among various drugs alpha 2 agonist Dexmedetomidine and opioid Fentanyl have beenobserved to abolish the tracheal intubation response in general anesthesia.
3. In the presence study both Dexmedetomidine and Fentanyl at dosages of 0.5 mic/kg and 1.5mic/kg respectively have attenuated the intubation response but not significantly.
4. Dexmedetomidine at dosage of 0.5 mic/kg was found to be superior when compared toFentanyl 1.5 mic/kg is attenuated the intubation response.
5. May be increasing the dosage of Dexmedetomidine might show a significant difference inMitigating the intubation response.

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