IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 21, Issue 2 Ser.7 (February. 2022), PP 33-36
www.iosrjournals.org

Comparison of Dexmedetomidine infusion / clonidine infusion for induced hypotension & olegamic field for middle ear surgeries under general anaesthesia.

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Abstract
Background:
Induced hypotension associated with balance anaesthesia minimise blood loss& provide olegamic field. Dexmedetomidine , clonidine are α2-adrenoceptor agonists emerging as preferred choice present era..
Aims& objectives:
The aim of the study is to compare hemodynamic stability and sedation under Dexmedetomidine infusion vsersus clonidine infusion during FESS.
Material & Methods:
After proper councelling and written informed consent from patients, 60 patients of age group 18 to 60 years of ASA grade I & II were selected and divided in to two groups randomly through odd& even numbering.
***Group A** : Inj. Dexmedetomidine 1 mcg/mg bolus followed by 0.5 mcg/mg/hr given through syringe pump.*
***Group B:** inj. Clonidine 1 mcg/ mg following 0.5 mcg/ mg / hr is given through syringe pump*
OBSERVATIONS & RESULTS:
There was significant reduction in Mean arterial pressure after bolus infusion of Dexmedetomidine in group A.($p<0.05$)
between group Aand group B was not statistically significantt difference found in diastolic blood pressure of both the groups. There was a significant reduction in heart rate in group A as compared to group B .
Conclusions:
Dexmedetomidine & clonidine both are effective to provide induced hypotension & betterOlegamic field.
***Key words:** Dexmedetomidine , clonidine ,ENT surgeries, general anaesthesia, olegamic field.*

Date of Submission: 02-02-2022 Date of Acceptance: 15-02-2022

I. Introduction:

Dexmedetomidine & clonidine are α_2-adrenoceptor agonist that have sedative and analgesics effects(.1,2,3,4) Clinical investigations have demonstrated its sedative, analgesic and anxiolytic effects after IV administration's to volunteers and postsurgicalpatients.([5,6,7,8])

It is a novel analgesic agent that helps at preoperative state, postoperative period and during surgery especially for hemodynamic stability.(4,9).

II. Material & Methods

After proper councelling, 60 patients of physical status ASA grade 1-2 aged between 15-50 years undergoing ear surgery were randomly selected from NHLM Medical Collage, ENT OT during period of February 2017- February 2018. A Preoperative visit was made on the day prior to plan surgery.

Exclusion criteria: patient having Hypertension,on antihypertensive therapy.

All routine investigations were done. Patients were explained about the concerned technique & informed consent taken. Patients were instructed to keep fasting for 6-8 hours. All the resuscitation and monitoring equipments kept ready in Operation theatre.

In the operation theatre Baseline Vitals HR,$SpO_2$and NIBP were recorded.. Premedication was given in the form of inj. Glycopyrolate 0.04 mg/ kg and inj. Ondansatron 0.08 mg/kg IV. , 10 min before

operative procedure were given. IV fluids in form of Inj.DNS 8 ml/kg/ hr started.All patients were given general anaesthesia byinj thiopentone 6 mg/ kg followed by inn Atracurium 0.5 mg/ kg& intubated,& maintenance by oxygen,N20, sevoflurane on Drager workstation.

Patients were randomly allocated in 2 groups by sealed opaque envelope method by odd& even number . Execution ofRandomisation at time of General anaesthesia as follows:

Group A : Dexmedetomidine group (n= 30) - Inj. Dexmedetomidine 1µg/kg, bolus over 10 min through infusion pump followed by

0.5µg/kg/hr.

Group B : inj clonidine 1 mcg/ kg given following 0.5 mcg/ kg/ hr.

At the time of surgical closure infusion was stopped in both groups.

SBP,DBP,HR,SPO2 were monitored periodically & data were noted in MS Excel .

Intraoperative bleeding was assessed by bleeding scale of Bozzeart .of(0-4).

Intraoperative bleeding scale(6)

0 - No bleeding,

1 - Slight bleeding; no suctioning of blood required

2 - Slight bleeding; occasional suctioning required. Surgical field not threatened

3 - Slight bleeding; frequent suctioning required. Bleeding threatened surgical field a few seconds after suction was removed

4 - Moderate bleeding; frequent suctioning required. Bleeding threatened surgical field directly after suction was removed.

At the end of surgery neuromuscular blockade was reversed with inj glycopyrollate& neostigmine . patients were extubated uneventful.

patient satisfaction score & surgeon satisfaction score were notified in terms of poor, satisfactory, good,& excellent.

Statastical Analysis:

Data were collected I. Ms Excel spreadsheet & analysed by SPSS software IBM Armonk NY USA.version 20.

Qualitative data were analysed by student unpaired T test

Categorical data were analysed by chi square test.

III. Results

A study of 60 patients aged between 15-50 yrs undergoing middle ear surgery under general anaesthesia were randomized into 2 groups with 30 patients in Group A (Dexmedetomidine) and 30 patients in Group B(clonidine). The study was undertaken to compare the olegamic field, hemodynamic changes of Dexmedetomidine infusion / clonidine infusion.

Demographic data is shown in Table 1.

Dexmedetomidine group which was responsive to I.V. fluids. There was a significant reduction in heart rate in group A as compared to group B (Figure 4).

Table 1 Demographic parameters

Parameters (mean+/-SD)	Group A	Group B	Pvalue
Age(years)	30+/-8.2	29+/-7.8	>0.05
Sex(M/F)	(14/16)	(15/15)	-
Duration of surgery (mins)	100+/-20.5	102+/-18.5	>0.05

Table2: various scores monitored

Scores	Group A-	Group B-	Pvalue
Bleeding score of Bozzeart	1.67+/-0.45	1.72+/-0.35	
Patient satisfaction Score	Good	Satisfactory	<0.05
surgeon satisaction score	excellent	good	-

Table 3 :Changes in Systolic blood pressure(SBP)& Diastolic blood pressure (DBP)

Time	Group A(SBP/DBP)	Group B(SBP/DBP)	P value
Baseline	(124+/-20) /(80+/-8)	(120+/-22)/(80+/-6)	>0.05
10 min	(100+/-16)/(70+/-10)	(108+/-12)/(78+/-2)	<0.u05
20 min	(100+/-12)/(70+/-8)	(108+/-14)/(78+/-4)	<0.05
30 min	(98+/-10)/(72+/-8)	(106+/-16)/(76+/-4)	<0.05

45 min	(98+/-12)/(72+/-6)	(104+/-14)/(76+/-3)	<0.05
60 min	(100+/-14)/(72+/-6)	(108+/-14)/(76+/-4)	<0.05
90 min	(100+/-12)/(72+/-4)	(110+/-12)/(74+/-6)	<0.05
120 min	(104+/-12)/(72+/-4)	(110+/-14) / 76+/-4)	<0.05

Table 4:Changes in Heart Rate

Time	Group A	Group B	P value
Baseline	84+/-10	82+/-10	>0.05
10 min	74+/-14	80+/-14	<0.05
20 min	70+/-14	78+-12	<0.05
30 min	68+/-12	78+/-14	<0.05
45 min	68+/+12	76+/-12	<0.05
60 min	68+/-10	78+/-14	<0.05
90 min	64+/-10	78+/-16	<0.05
120 min	64+/+10	78+/-14	<0.05

There was no. Significant change in Diastolic blood pressure (DBP),spo2, Respiratory Rate.

IV. Discussion:

Mild hypotension provides suitable intraoperative conditions as well as comfort for patients. The commonly used drugs are Midazolam, Propofol, and opioids such as Fentanyl, Alfentanil or Remifentanil.Occasionally, the administon of sedatives or hypnotics in conjunction with analgesics can cause significant respiratory depression and/or transient upper airwayObstruction.[12] Since the approval of Midazolam by FDA in 1985,[13] practitioners of all medical disciplines embraced the versatility provided by Midazolam though the risk of losing airway control, hypoxia and hypotension with higher doses of Midazolam has also been recognized.

Monitored anaesthesia care (MAC) may be applied for various ENT surgeries in which an adequate sedation and analgesia without respiratory depression are desirable for comfort of both the patient and the surgeon.[11] but we have counducted middle ear surgeries under general anaesthesia In order to reduce the incidence of complications, it is important to have a bloodless surgical field as far as possible for better visibility. Bleeding control is usually attained with local application of epinephrine.(10) Pain during surgery may lead to sympathetic stimulation and a restless patient may have tachycardia and hypertension, leading to increased bleeding in the surgical field.

Dexmedetomidine is a highly selective α_2-adrenoceptor agonist with eight times higher specificity for the receptor compared to clonidine. It provides excellent sedation and analgesia with minimal respiratory depression.

In group A dexmedetomidine was infused it produced reduction in BP & pulse, 8.14% -

18.14% reduction in systolic blood pressure and in HR 20% reduction was seen. In group clonidine did not produced significant changes in BP & pulse,1.83%-9.61% reduction in systolic blood pressure, and 0.7%-12.3% decrease in HR is seen Oxygen saturation was maintained in both the groups.

Kumari I.et al,(3) done Comparison of clonidine versus Midazolam in monitored anesthesia care during ENT surgery. They evaluate intragroup variations, mean HR and MAP showed a significant fall from baseline in Clonidine Group, whereas they showed a significant rise from baseline in Midazolam Group. On intergroup comparison mean HR and MAP were significantly less in Group C as compared to Group M.[3]

Devangi A. Parikh et al., evaluate Dexmedetomidine & midazolam- fentanylin tympanoplasty, they said that lower HR and MAP in Dexmedetomidine group in comparison to the Midazolam(13)

-Fentanyl group could be explained by the markedly decreased sympathetic activity. There finding were similar to other studies where lower HR and MAP were observed in the Dexmedetomidine group. There result suggest that Dexmedetomidine has clinical advantage over Midazolam in providing a better operative field for microscopic surgery.[13]

Danielson et al, have evaluated this property of Dexmedetomidine for providing controlled hypotension in general anaesthesia for tympanoplasty cases and concluded that it is a useful adjuvant to decrease bleeding when a bloodless surgical field is required. (9)

The sedation effects evoked by α_2 agonists most likely reflects inhibition of this nucleus. In our study, sedation score was slightly higher in group A compare to group B, but P>0.05 indicate that statistically no significant difference found between group A and group B.

Devangi A. Parikh et al., evaluate Dexmedetomidine vs Midazolam Fentanyl in tympanoplasty, in there study both the drugs were comparable in terms of sedation as none of the patient in ether group required additional sedation with Propofol or any alternative anaesthesia technique, as in our study.(13)

In our study, bleeding score was less in group Acompares to group B, indicate that Dexmedetomidine reduces blood loss and provide better Olegamic surgical condition in comparison to Midazolam-fentanyl combination.

In our study Surgeon's satisfaction score and patient's satisfaction score both were high in group A compare to group B.

Na HS etal demonstrated Dexmedetomidine used significantly less rescue Tramadol in comparison to group Midazolam wh. Analgesic property of α_2 agonists like Dexmedetomidine with its opiate-sparing properties conducted in general anaesthesia with dexmeditomidine.(12)

Parikh DA et al., evaluate Dexmedetomidine vs Midazolam-Fentanyl in tympanoplasty, they demonstrated significantly higher patient and surgeon satisfaction scores with Dexmedetomidine. The lower HR and MAP in these patients could have probably resulted in a better surgical field thus attributing to better surgeon satisfaction.(13)

In nutshell it can be concluded that for tympanoplasty& mastoidectomy surgeries performed under balance general anaesthesia, both Alpha agonists are good choice for olegamic field but Dexmedetomidine could be a better alternative to clonidine, as it provides better Olegamic surgical field leading to increased satisfaction of both patient and surgeon.

Limitations:

Unavailability of BIS monitor to measure depth of anaesthesia which provides haemodynamic changes was limiting factor.

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Dr Rupal.J.Shah, et. al. "Comparison of Dexmedetomidine infusion / clonidine infusion for induced hypotension & olegamic field for middle ear surgeries under general anaesthesia." *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, 21(02), 2022, pp. 33-36.