CONSCIOUS SEDATION FOR CATARACT SURGERY DONE UNDER RETROBULBAR BLOCK – A COMPARATIVE STUDY EVALUATING THE EFFECTS OF MIDAZOLAM AND DEXMEDETOMIDINE

Dissertation submitted to

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY ***in partial fulfilment of the regulations for the award of the degree of***

M.D. BRANCH - X
ANAESTHESIOLOGY

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TIRUCHIRAPPALLI
THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY
CHENNAI, INDIA

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BONAFIDE CERTIFICATE

This is to certify that the dissertation entitled "**CONSCIOUS SEDATION FOR CATARACT SURGERY DONE UNDER RETROBULBAR BLOCK – A COMPARATIVE STUDY EVALUATING THE EFFECTS OF MIDAZOLAM AND DEXMEDETOMIDINE"** is the bonafide original work of **Dr.R.INIYA** in partial fulfilment of the requirements for M.D. Branch-X (Anaesthesiology) Examination of the Tamil Nadu Dr. M.G.R. Medical University to be held in April 2015.

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DECLARATION

I **Dr.R.INIYA** , solemnly declare that dissertation titled, **'CONSCIOUS SEDATION FOR CATARACT SURGERY DONE UNDER RETRO BULBAR BLOCK – A COMPARATIVE STUDY EVALUATING THE EFFECTS OF MIDAZOLAM AND DEXMEDETOMIDINE'** is a bonafide work done by me at K.A.P.V. Government Medical College, during 2012-2014 under the guidance and supervision of my Professor & Head of the Department of Anaesthesiology Prof**. Dr. N. JOTHI, M.D., D.A.**

The dissertation is submitted to the Tamilnadu Dr. M.G.R. Medical University, towards the partial fulfilment of requirement for the award of M.D. Degree (Branch – X) in Anaesthesiology.

Place: Trichy

Date :

Dr. R.INIYA

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TIRUCHIRAPALLI -1
INSTITUTIONAL ETHICS COMMITTEE

CERTIFICATE OF CLEARANCE

This is to certify that the project work titled **Conscious sedation for cataract surgery -A comparative study between midazolam and dexmedetomidine** proposed by **Dr.R.Iniya** part of fulfillment of M.D/M.S course in the subject of **ANAESTHESIA** for the year **2012-2015** by The Tamilnadu Dr.MGR Medical University has been cleared by the ethical committee.

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INTRODUCTION

- Cataract surgeries were carried out under regional anesthesia[1-3]
- A comfortable co-operative stationary patient is a key to achieve good result with these patients[4,5]
- Hence in this study conscious sedation for cataract surgery under retro bulbar block had been carried out and result were observed for
  - Safer patient cooperation[6,7]
  - anxiolysis and patient comfortness
  - surgeons satisfaction
  - Stable hemodynamics
  - Lack of complication

✓ There has been a recent development in practice of sedation and analgesia during ophthalmic procedure particularly cataract surgery

✓ Cataract surgeries are performed by placing the patient under moderate sedation, a practice that is named as 'conscious sedation'. Conscious sedation is required to reduce the anxiety of the patient, discomfort and pain during the procedure and to increase the cooperation.

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Dr.R.INIYA

CONTENTS

Conscious sedation for cataract surgery done under retro bulbar block

A Comparative study evaluating the effects of midazolam and dexmedetomidine

ABSTRACT

Need for the study

- Cataract surgeries were carried out under local anesthesia
- A comfortable co-operative stationary patient is a key to achieve good result with these patients
- Hence in this study conscious sedation supplemented with

Peribulbar block has been carried out and results were observed

for

- better patient cooperation
- anxiolysis and patient comfortness
- surgeons satisfaction
- Stable hemodynamics
- Lack of complication

Aim and objectives

- To study the effects of conscious sedation in cataract surgery
- In this study we compare the effect of midazolam with dexmedetomidine and with that of control group

Method of collection of data

Prospective randomised double blind clinical control trial

Methodology

- After obtaining informed written consent, patients will be randomly divided into 3 groups by draw of lots.

- Group M-patients receiving midazolam

  Loading dose-0.03mg/kg

  Maintenance dose-0.05mg/kg/hr

- Group D-patients receiving dexmedetomidine

  Loading dose-0.3mcg/kg over ten min

  Maintenance dose-0.3mcg/kg/hr

- Group C-control.

  Loading dose – plain 0.9% N.S

  Maintenance dose- plain 0.9% N.S

- Loading dose is followed by peri bulbar block after 10 min
- Maintenance dose is given in infusion throughout the procedure and infusion is stopped at the end of surgery
- Supplemental oxygen will not be provided except in case of desaturation(SPO2-95%)

PARAMETERS MONITORED

Baseline B.P, Pulse rate, SPO2.

Blood pressure, pulse rate,SPO2,R.S,S every 2 min from the time of loading dose to the time the surgery was started

Wong Baker Facial pain rating scale at the time of retrobulbar block [(4)]

Intra op vitals-B.P, pulse rate, E.C.G, SPO2 every 5 min

Ramsay sedation score every 1 min from the time of loading dose till they attain the Ramsay sedation score of 3 and every 5 min there after

Patient movement scale during surgery

Aldrete recovery score every min after the end of surgery and time to attain the score of 10 was recorded.[11].

Patient was shifted to recovery room after they attain a Aldrete recovery score of 10

Likert like verbal rating of surgeon's satisfaction at the end of surgery

Patient will be asked whether they were aware of 'unpleasant intraoperative events' in the post operative period

Post op vitals and Ramsay sedation score every 10 min for 2hrs in the post op period

RESULTS

We found that conscious sedation was safe and effective in the case of cataract surgery and was associated with greater patient 's comfort and surgeon's satisfaction when compared to the surgeries which was done only with retro bulbar block alone

Midazolam in a loading dose of 0.05mg/kg and in a maintenance dose of 0.03mg/kg was equally effective to dexmedetomidine in the aspect of patient's co- operation during retro bulbar block and during surgery which was assessed

by facial pain scale,patient movement scale and surgeon satisfaction scale and recall of intra op events

Midazolam was slightly better to dexmedetomidine in the aspect of better hemodynamic profile

However mean time to reach RSS of 3 was rapid with dexmedetomidine when compared to midazolam. But time to reach Aldrete recovery score 10 was prolonged in dexmedetomidine when compared to midazolam. Both the drugs had no significant complications in the peri operative period

Conclusion

We conclude that conscious sedation is safe and effective to practise in the case of cataract surgeries and is associated with better patient co operation and surgeon comfort when compared to the surgeries which are done with retrobulbar block alone. Midazolam and dexmedetomidine are equally effective in the aspects of patient co operation and surgeon's comfort but midazolam is slightly superior to dexmedetomidine in the aspect of better hemodynamic profile

INTRODUCTION

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    - better patient cooperation[6]
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    - surgeons satisfaction
    - Stable hemodynamics
    - Lack of complication
- There has been a recent development in practice of sedation and analgesia during ophthalmic procedure particularly cataract surgery
- Cataract surgeries are performed by placing the patient under moderate sedation, a practice that is named as ′conscious sedation′. Conscious sedation is required to reduce the anxiety of the patient, discomfort and pain during the procedure and to increase the cooperation of the patient throughout the procedure and helps in improving the performance of the procedure by the ophthalmologist.

- Various drugs have been used to provide conscious sedation. Current drugs include benzodiazepines[26]most commonly midazolam , opioids [27] ,ketamine. with or without propofol. [2,3,4] . Newer agents such as dexmedetomidine and fospropofol are also being used nowadays.
- Midazolam is favoured because of its faster onset and short duration of action. It also has high amnestic properties. Midazolam is the shortest-acting among the benzodiazepines available.The adverse effects of midazolam are hypotension, respiratory depression and hypoxemia if given in larger doses and particularly when it is combined with an opioid.
- In recent years, dexmedetomidine is widely being used as an alternative to midazolam in conscious sedation. It produces a unique form of ′conscious sedation′ in which (patients appears to be in a state of sleep but can be aroused readily) with good analgesic effect and without significant respiratory depression.[7]

AIM OF THE STUDY

The aim of the study is to study the effects of conscious sedation in Cataract surgery .In this study we compare the effects of midazolam with dexmedetomidine as conscious sedation and with that of control group where no conscious sedation is employed

DEFINITION OF CONSCIOUS SEDATION

Conscious sedation is defined as a state in which the patient will be in a depressed level of consciousness and tolerate unpleasant procedures while maintaining oxygenation, airway control and cardio vascular function.

Nowadays it is preferred in many of the day care[29] surgeries like cataract surgeries, cholangio pancreatography, dental procedures, and minor procedures during trauma care.

This procedure has lead to lesser duration of hospital stay with lesser incidence of post operative complications. Conscious sedation has been even in paediatric population in number of day care procedures which is associated with better patient co operation in case of children.

ASA CLASSIFICATION FOR SEDATION [25]

Conscious sedation comes under the group of moderate sedation as per ASA continuum of sedation

	Minimal sedation	Moderate sedation	Deep sedation	General anaesthesia
Responsiveness	Normal to verbal stimulus	Purposeful response to verbal or tactile stimulus	response to repeated or painful stimulus	Unarousable to painful stimulus
Airway	unaffected	No intervention required	Intervention maybe required	Intervention often required
Ventilation	unaffected	Adequate	May be inadequate	Frequently inadequate
Cardio resp function	unaffected	Usually maintained	Usually maintained	May be impaired

The guidelines for ambulatory anaesthesia and surgery for conscious sedation used by the American Society of Anaesthesiologists specifies following needs:

- A physician who has license should always be present while the patient is getting treatment, recovery and discharge.
- The facility must possess good equipments and must follow the local, state and federal laws applicable for operations. Attendance staff should always be adequate enough to meet facility and patient needs
- The physicians, other practitioners and nurses should be duly qualified and licensed.
- The physicians in the facility who provide medical care to patients should be collectively organized into a medical staff. This group of facility will take the responsibility for credential review, quality assurance, privileges delineation and responsibilities and peer review. The availability of the personnel and equipment must be adequate so that it would be easy to tackle emergencies. To handle the transfer of unanticipated patient to an acute care hospital the facility must have established procedures and policies.

The patient care as per the American Society of Anaesthesiologists Guidelines for Surgery and Ambulatory Anaesthesia for conscious sedation shall include:

- Instructions and preparation of patients should be done preoperatively
- A physician should take appropriate history from the patient and do physical examination prior to sedation
- Under the direction of a qualified physician or he himself shall administer the procedural sedation
- The appropriate personnel from anaesthesiology shall always administer general anaesthesia.
- The criteria for patient discharge is under the responsibility of a physician
- The written postoperative instructions and follow-up instructions must be provided with patients.
- The facility must maintain accurate, current and confidential medical records.
- Physiologic Monitoring of the patient

The American Society of Anaesthesiologists (ASA) outlines certain important areas for patient monitoring while in moderate or deep sedation.

Level of Consciousness

Analgesia is considered as an excellent guide actually to assess the level of consciousness. By means of monitoring this level of consciousness, it can help in finding any adverse drug responses or reactions so early which is definitely helpful in treating patients quickly in a timely manner. Thereby this assessment is a great gift in reducing risks of patients for both moderate and deep sedation. A patient who is under moderate sedation should be capable of responding to verbal commands and also to the light tactile stimuli. Whereas more profound stimuli will be required to produce the response in the case of patient in deep sedation. That too the response is only reflex withdrawal due to those painful stimuli which clearly denotes that patient is on deep sedation and bordering on general anaesthesia.

Pulmonary Ventilation:

Respiratory depression is the most common primary causative factor of morbidity often in association with sedation and analgesia. This is referred as drug-induced respiratory depression. These kind of adverse outcomes possibly can occur. In order to reduce this risk simply we have to monitor the ventilatory function. This is achieved by mere observation

or auscultation which includes sensation of exhaled air, observing abdominal or chest excursions of patient and thoracic palpation. During moderate and deep sedation Capnography monitoring is used[20]. In a circumstance of patient being separated from the caregiver of facility then we may have application of using automated apnoea monitoring. Pulse oximetry cannot be used as a substitute for ventilatory function monitoring. This is because oxygenation and ventilation processes are separate physiologic processes.

Oxygenation:

The adverse events include cardiac arrest and death may occur rarely due to hypoxemia. But these adverse events can be reduced greatly by the usage of pulse oximetry as it gives early alarms in detecting the hypoxia. Pulse oximetry is very effective in the process of detecting hypoxemia while the patient is in sedation rather than by clinical assessment alone.

Hemodynamics:

Monitoring vital signs in a regular manner decreases the occurrence of adverse outcomes when the patient is in moderate or deep sedation. Analgesic and sedative agents may often interfere appropriately with autonomic compensation for stressors and hypovolemia. On the other hand, if the sedation given is inadequate then it may develop dangerous stressor responses like hypertension

and tachycardia. These likely complications may be decreased by means of early detection of blood pressure and heart rate changes occuring in patients , otherwise these complications can lead to some serious problems. Vital signs should be carefully monitored timely for every 3-5 mins once the patient established a stable level of sedation. Continuous monitoring of electrocardiogram (ECG) is very much useful in reducing the risks of patient during deep sedation and also for the patient with high risks such as significant dysrhythmias or cardiovascular disease. In normal risk individuals with moderate sedation there is no clear idea in supporting the use of electrocardiography.

Standard Monitoring:

The parameters used in standard monitoring for the sedated patients as specified in ASGE comprise of measurement and recording of following:

- Heart Rate
- Oxygen Saturation
- Blood Pressure
- Respiratory Frequency and Ventilation

Recovery and Discharge:

There is a purpose of post sedation monitoring to make sure that patient has returned back to normal acceptable level of functioning before getting discharged. Recovery and discharge depends upon many factors such as length and type of procedure performed, age and physiologic condition of the patient, quantity and the kinds of sedative or analgesic agents administered and presence of any procedural complications. Consciousness level, oxygenation , hemodynamic parameters and pain level should be measured at regular time intervals until all returns to baseline value. If reversal agents such as naloxone and flumazenil (short duration of action) are used then it may require a more extended monitoring time period (up to 2 hours to reverse).

Post Sedation Monitoring:

Steps following the procedure consist of :

- Monitoring should be continued until vital signs are within normal acceptable limits and consciousness returns to baseline. Aldrete Score , a standardized discharge scoring system should be applied to determine patient's recovery.
- Measurement of respiratory rate, heart rate, pulse oximetry and blood pressure at least for every 5 minutes during recovery.

- Resuscitation equipment and well trained individual should be available for managing complications throughout recovery.
- A patient is suitable for discharge if he or she is able to walk and dress independently or when all physiologic criteria are met. Upon discharge, patients need to get instructions regarding medications and follow-up. A patient must be discharged only with the care of a responsible person to accompany him home.

Risks and Complications:

Respiratory Depression:

For suspected or confirmed cases follow the steps

- Stimulate to wake up and take deep breath
- If no response, go for chin lift and jaw thrust for patent airway.
- Administer antagonists – Naloxone for opioids and flumazenil for benzodiazepines.
- If still no response, then go for bag mask ventilation and then oropharyngeal airway.
- At last ET tube insertion or Laryngeal Mask Airway should be considered.

Cardiac Complications:

- ❖ During procedural sedation, cardiac arrhythmias can occur.
- ❖ Sedation can cause both hypotension and hypertension.

Paradoxical Reactions[5] :

A state of excitement can be seen with benzodiazepines as sedation in some patients (less than 1% cases). These include movement, excessive talkativeness and emotional release.

Predisposing Patient Characteristics:

- ❖ Genetic predisposition
- ❖ Young and advanced age
- ❖ Alcoholism / drug abuse
- ❖ Psychiatric and/or personality disorders

Management:

- ❖ A benzodiazepine antagonist, flumazenil is effective in minimizing the side effects.
- ❖ In few cases, droperidol resolves it.
- ❖ But often, propofol is administered for better control.

CATARACT SURGERY

Cataract is a disease of the lens leading to decrease in transparency due to degenerative changes leading to breakdown of tissues and 'clumping of proteins'.

It is more common in the old age due to aging process and it characterized by progressive loss of vision

Various treatment options are available for cataract surgeries like

Small incision cataract surgery

Extra capsular cataract surgery

Phaco emulsification

Most of the procedures are being carried out under regional blocks like retro bulbar block or peri bulbar block with or without being supplemented with conscious sedation

It is also carried out under topical anaesthesia with local anesthetic agent and it is also usually supplemented with sedation.

Many of the surgeons experience better patient co operation and good working condition as it is associated with lesser patient movement during the procedure and also patients experience less anxiety during the surgery

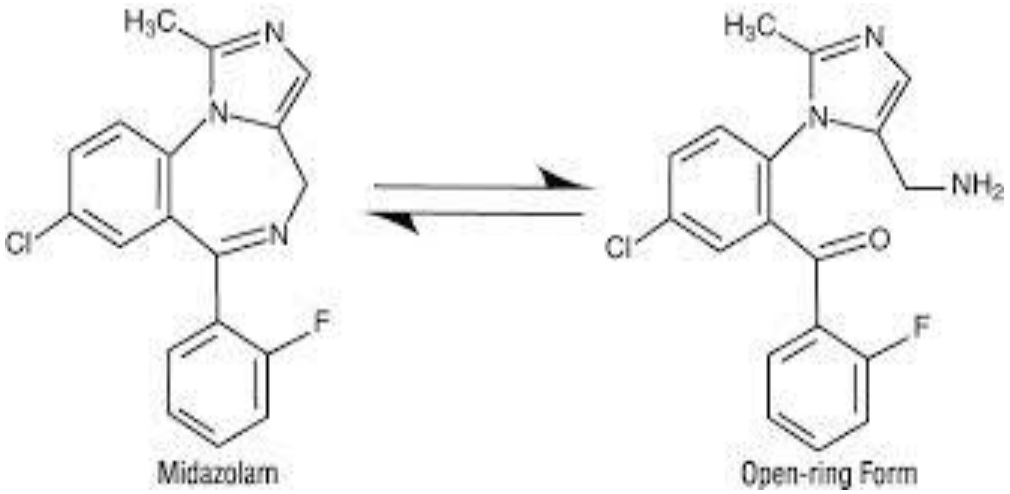
PHARMACOLOGY OF MIDAZOLAM[23]

Midazolam is a short acting benzodiazepine. It has all five properties which is characteristic of a benzodiazepine such as anxiolysis, sedation, anti convulsant, sedation, anticonvulsant action, skeletal muscle relaxation and anterograde amnesia.

STRUCTURE-

Midazolam is a water soluble benzodiazepine with an imidazole ring in its structure that accounts for its stability in aqueous solutions and rapid metabolism

MIDAZOLAM (C13 H13 Cl FN3)



Metabolism

Midazolam has absorption through G.I.T and rapid passage across blood brain barrier. It is extensively bound to plasma protein that is about 96-98%.

Midazolam has shorter duration of action due to high lipid solubility which causes rapid redistribution and also causes rapid hepatic clearance. The elimination half life is 1 to 4 hours and the volume of distribution is 1-1.5L/kg.

Clearance of midazolam is shorter than diazepam and hence it can be safely used as infusion.

DOSAGE AND DURATION

Dose for sedation: - 0.01-0.05mg/kg

Maintenance infusion dose: - 0.02 to 0.05mg/kg loading followed by 0.01-0.05mg/kg/hr

Onset of action – 30 to 60 sec

Time to peak effect: - 3 to 5 min

Maximum Duration of sedation: - 90 min

GABA RECEPTORS

They are special receptor group chiefly responds to the action of Gamma-Amino Butyric Acid (GABA), an inhibitory neurotransmitter in central nervous system. They are divided into two namely GABA-A and GABA-B.

GABA-A Receptors:

They are ligand gated ion channels also called as ionotropic receptors. They are quick in their inhibitory action. This super family has many members which include GABA-A receptors, nicotinic acetylcholine receptors, 5-HT3 receptors and glycine receptors. They all have a characteristic loop formation between two cysteine residues mainly by a disulphide bond.

Mechanism of Action

Binding of agonists to their binding sites in the extracellular area of receptor results in conformational change leading to opening of chloride ion channels. Their increased influx causes reversal potential of -65mV in neurons, thereby inhibiting the firing of new action potential. Ultimately this results in the sedative effects of the GABA-A agonists.

Distribution

They are present mainly in many parts of central nervous system. But they are also found in leydig cells, placenta, immune cells, bone growth plates, liver and various endocrine tissues. These receptors can influence cell proliferation.

Structure and Function

The most common type of structure is a pentamer consisting of 2 alpha, 2 beta and a gamma subunit . But in humans several subtypes are there include

Alpha subunit- 6 types as GABRA(1,2,3,4,5,6)

Beta subunit - 3 types as GABRB(1,2,3)

Gamma subunit - 3 types as GABRG(1,2,3)

Delta subunit as GABRD,

GABA site - the interface between alpha and beta subunits is considered as GABA site. Chiefly Gamma-Amino Butyric Acid (GABA) and other agonists exert their inhibitory action in this site. Their inhibitory response is very quick due to opening of chloride channels and their increased influx stops generating new potential. This leads to early part inhibitory post-synaptic potential (IPSP).

Benzodiazepine site (BZD site)

The area interface between alpha and gamma subunits of GABA-A receptor is referred as BZD site. Inosine is the endogenously available ligand that exerts its action on this site.

GABA-A rho receptor.

This is a variant in GABA-A family. Now it is considered as subfamily. These are present in retinal bipolar cells. They are not sensitive to benzodiazepines and barbiturates.

GABA-B Receptor

They are G-protein coupled receptors, also called as metabotropic receptors. Their response to gamma-amino butyric acid (GABA) is slow.

ACTION OF MIDAZOLAM ON GABA A RECEPTORS

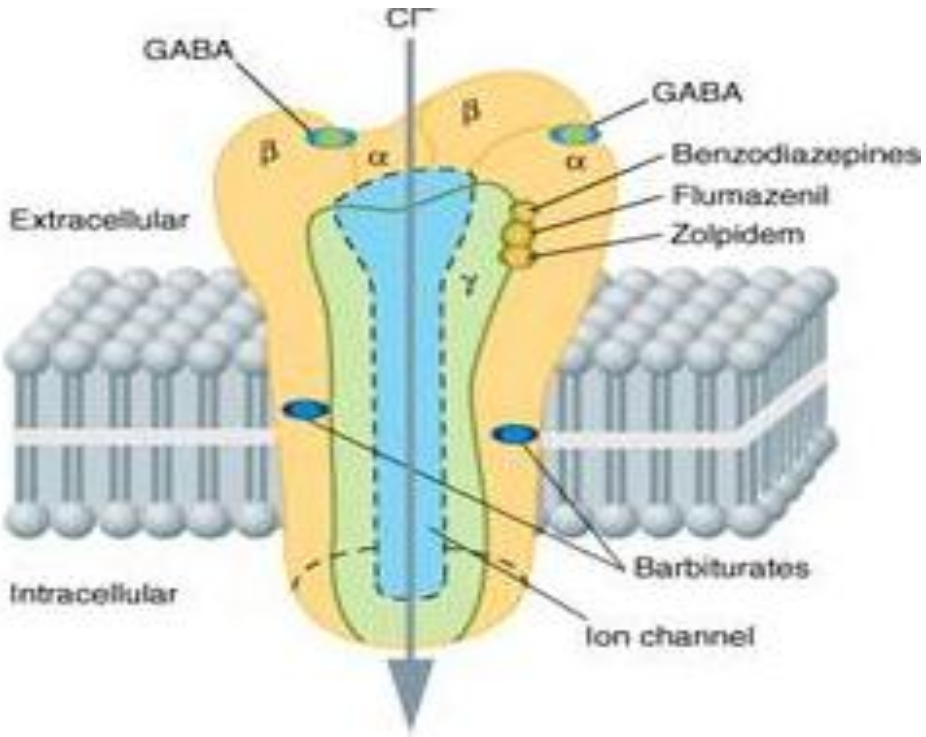
Midazolam acts on BZD binding site on GABA A receptors.

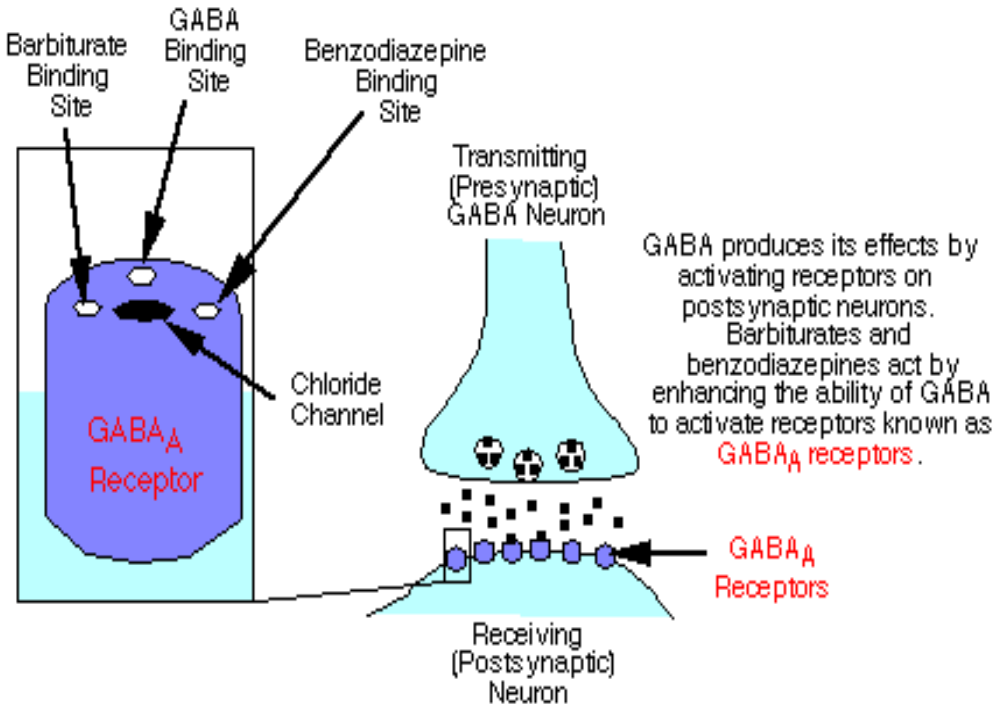
BZD receptors are found in high density in cerebral cortex, cerebellum, hippocampus, substantia nigra and in lower density in lower brain stem and spinal cord.

Midazolam binds to BZD receptors and produces conformational changes which increases the binding affinity of GABA to the receptor and thereby facilitates GABA mediated chloride channel opening and causes hyper polarization of membranes. It has GABA mimetic and GABA facilitatory effect.

Sedation, anterograde amnesia, and anti convulsant properties are mediated by α1 subunit of GABA A receptor while anxiolysis and muscle relaxant are mediated by α2 subunit of GABA A receptor.

Effect of the drug is based on proportion of receptor occupancy. 20% receptor occupancy is found to be sufficient to produce anxiolysis, 30% to 50% occupancy is needed for sedation and unconsciousness is produced in more than 60% of receptor occupancy.





METABOLISM

Metabolized by hepatic enzymes mainly cytochrome P450.Principal metabolite is 1-hydroxy midazolam which is half as potent as midazolam and is excreted by kidneys.

Clearance is not altered in renal failure because of high hepatic clearance Clearance is delayed in obese patients

DRUG INTERACTIONS

Metabolism is slowed in the presence of drugs like cimetidine, erythromycin, antifungals and calcium channel blockers which inhibit cytochrome P-450 enzymes.

Fentanyl is also metabolized by cytochrome P-450 and hence clearance of midazolam is delayed in the presence of fentanyl.

It decrease the MAC of volatile agents

PHARMACODYNAMICS-

Effect on CNS-

Midazolam -

Decreases cerebral metabolic oxygen requirement

Decreases cerebral blood flow

Produces little or no chance in intra cranial pressure. Hence can be used for induction in intra cranial pathology

Its anticonvulsant property is used in status epilepticus

Effect on CVS[19]

It produces decrease in B.P and heart rate is decreased

Cardiac output is not affected and decrease in B.P is due to decrease in systemic vascular resistance.

But due to a plateau in plasma concentration there is a ceiling effect for this decrease in B.P

EFFECT ON RESPIRATORY SYSTEM

In a dose of 0.15mg/kg iv it produces dose dependent decrease in ventilation.

Causes apnoea in larger doses that is above 0.15mg/kg.Depress swallowing reflex and decreases airway reactivity.

CLINICAL USES

PREMEDICATION

It is used as premedication orally in the dose of 0.5mg/kg 30min before surgery which provides significant anxiolysis

INTRAVENOUS SEDATION[9]

Onset of sedation is rapid and is associated with lesser incidence of hemodynamic instability and respiratory depression if midazolam is administered alone. But the incidence of hemodynamic stability and respiratory depression is higher if used along with other sedatives and opiods.

Patient usually remains awake when the maintenance infusion is stopped at the end of the procedure.

Hence it is used for sedation either as intermittent dosing or continuous infusion in I.C.U as well in minor procedures.

AMNESIA

It also has the advantage of amnesia. In a plasma level of 50 ng/ml the patient remains arousable and amnestic.

Dose required to produce amnesia is 0.5-0.75mg/kg

The duration of amnesia after anesthetic dose is 1-2 hours and is lesser if only sedative dose is used. They lack analgesic property.

INDUCTION

In a dose of 0.05-0.1 mg/kg they are used as inducing agent in general anaesthesia. But it does not reduce the increase in heart rate and B.P which is found to be associated with tracheal intubation.

MAINTENANCE OF ANESTHESIA

Due to high hepatic clearance and shorter duration of action the plasma level of the drug falls. Hence midazolam has to be given either as intermittent bolus or continuous infusion following loading dose to maintain the plasma level of the drug.

NAUSEA AND VOMITING PROPHYLAXIS

Midazolam reduces nausea and vomiting in a dose of 0.75mg/kg is and need for rescue anti emetics is reduced

RECTAL MIDAZOLAM

Rectal midazolam is used as a preanesthetic medication for children and the sedative dose is 1.0 mg/kg.

NASAL MIDAZOLAM

Intranasal midazolam may be used in combination with other drugs in diagnostic and short surgical procedures in children. A dose of 0.2

mg/kg-0.3 mg/kg (5 mg/ml, IV solution) in a 1-ml syringe was given. Cardiovascular stability was found to be excellent and no respiratory depression was evidenced.

The mean recovery time was 40 min in this noninvasive method of deep sedation.

SIDE EFFECTS

Incidence of venous irritation and thrombo phlebitis is less because of its aqueous solubility. Disturbing side effects are respiratory depression and prolonged emergence if administered in larger doses.

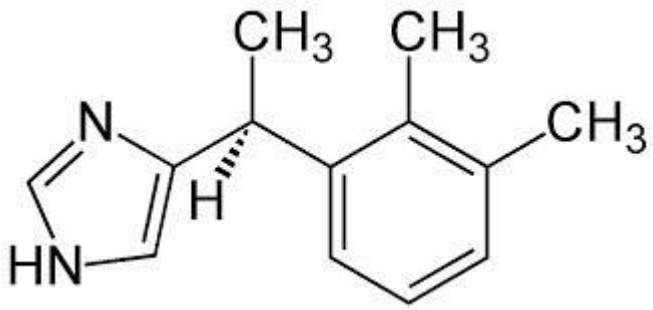
Antagonist used to reverse the midazolam is flumazenil.

PHARMACOLOGY OF DEXMEDETOMIDINE[24]

Dexmedetomidine is a α_2 agonist with 1600 times more selectivity for α_2 receptors when compared to α_1 receptors. It is a d-enantiomer of medetomidine which is used as sedative and analgesic in veterinary medicine for many years.

STRUCTURE

It belongs to imidazole subclass of α_2 agonist. It is freely soluble in water.



DEXMEDETOMIDINE (C13H16N2.HCL)

Pharmacokinetics

Dexmedetomidine is rapidly redistributed and extensively metabolized in liver and excreted in urine and feces.

It undergoes hydroxylation and n-methylation followed by conjugation. It is 94% protein bound.

It exhibits non linear pharmacokinetics.

It produces marked vasoconstriction in large doses.

Dosage and duration

Elimination half life – 2 to 2 and half hours[7]

Context sensitive half time- 4 to 5 minutes after stopping infusion of 10 min

Loading dose 0.3-1mcg/kg over 10-20 min

Maintenance dose – 0.1-0.7mcg/kg/hr

MECHANISM OF ACTION

Alpha 2_A Receptor

Alpha2 adrenergic receptor is a G-protein coupled receptor with Gi heterotrimeric G-protein. It has 3 subtypes alpha 2_A , 2_B and 2_C. Normally through these receptors only catecholamines (epinephrine & nor epinephrine) are in signal connection with Central and peripheral nervous system.

Alpha2_A receptor also called as ADRA2_A which also denotes gene encoding the receptor is located in chromosome 10. These receptors are located in central nervous system that includes locus coeruleus of brainstem, midbrain, hippocampus, hypothalamus, cerebral cortex, cerebellum, spinal cord.

Mechanism of Action

The alpha2 subunit present in inhibitory Gprotein - Gi gets detaches and attaches with adenylyl cyclase leads to inactivation of adenylyl cyclase results in decease in cAMP production. Therefore there

is no action of protein kinase A on phosphorylase kinase resulting in no phosphorylation in glycogen breakdown.

Role

It plays an important role in regulation of neurotransmitter release from sympathetic nerves and from adrenergic neurons in central nervous system especially presynaptic inhibition of neurotransmitter release. But most alpha2 receptors are present postsynaptically to noradrenergic ends, thus it helps in function of norepinephrine. Many postsynaptic alpha2_A receptors have significant effects on brain functions. For example alpha2_A receptor in prefrontal cortex helps in regulating higher cognitive function.

Agonists:

Dexmedetomidine

Clonidine

Guanfacine

Antagonists:

BRL-44408

Asenapine

DEXMEDETOMIDINE ACTION ON α_2 RECEPTORS[24]

Dexmedetomidine acts on α_2 receptors.

Three types of α_2 receptors are available. α_{2A} is located in periphery and α_{2B} and α_{2C} are located in brain and spinal cord.

- Post synaptic α_2 receptors in periphery produces vasoconstriction and presynaptic α_2 receptors produces vasodilatation by inhibiting norepinephrine release.
- Overall response of α_2 agonist is due to its effect on CNS and spinal cord. The receptors are involved in sympatholysis, sedation and antinociception .
- Dexmedetomidine acts by enhancing the endogenous sleep producing pathways. It produces decrease in the activity of projections of locus caeruleus to the ventro lateral preoptic nucleus. This increases GABAergic and galanin release in tubero mammilary nucleus producing decrease in histamine release in subcortical and cortical projections and thereby induces sleep
- It decreases the central sympathetic outflow and this is responsible for its effect in cardio vascular system in reducing B.P and pulse rate

PHARMACODYNAMICS

EFFECTS ON CENTRAL NERVOUS SYSTEM

SEDATION

Dexmedomidine produces sedative and hypnotic effect by its action on α_2 receptors in locus caeruleus and its analgesic action by α_2 receptors in locus caeruleus and within spinal cord.

Patients in I.C.U set up is found to be arousable and comfortable even if tracheally intubated when dexmedetomidine is used as a sedation.

It is therefore used to perform “daily wake up” test while weaning the patient off the ventilator in I.C.U patients.

If produces profound sedation and can be used as a total i.v inducing agent if used in a dose ten times that of normal sedative dose

Because of its short duration of action it is said to have no addiction potential, tolerance and dependence.

ANALGESIA

Main site of its action for analgesia is said to be in spinal cord and hence used in epidural and intra thecal administration.

When given intravenously it is said to have narcotic sparing effect. However it is not found to be effective as a sole analgesic agent but found to enhance the analgesia produced by other analgesics.

By reducing the central symphathetic outflow and by reducing $CMRO_2$ it is said to have neuro protective effect on CNS but this aspect is still under investigation.

Cortical evoked potentials and its amplitudes and latencies were minimally affected by dexmedetomidine and hence used in cases where neurological monitoring is used.

It is also said to reduce opiod induced muscle rigidity.

EFFECT ON RESPIRATORY SYSTEM

Dexmedetomidine at concentration producing significant sedation reduces minute ventilation but retains the slope of ventilatory response to increasing carbon dioxide.

PaCo2 increases mildly with dexmedetomidine but it reach a plateau after the first increment. It also exhibit a hypercarbic arousal phenomenon which is seen during normal sleep and it is a safety feature However ventilation is minimally affected in a dose which is used for conscious sedation.

EFFECTS ON CARDIO VASCULAR SYSTEM

It blunts the central symphathetic outflow thereby decreasing heart rate and blood pressure.It also decreases contractility of the heart.

If given in a dose of more than 2mcg/kg it is found to have biphasic response. An initial increase in B.P occurs due to its action on peripheral receptors but returns to baseline in 15 min and B.P gradually reduces to 15% below baseline in one hour.

With I.M injection this initial increase in B.P is not seen and heart rate and B.P remained within 10% of baseline

The incidence of hypertension and bradycardia is based on loading dose administration. Omitting the loading dose and not giving more than 0.5mcg/kg/hr reduces the incidence of hypotension.

Giving the loading dose over twenty minutes also minimizes the transient hypotension and Bradycardia.

The perioperative use of dexmedetomidine is found to reduce the incidence of perioperative myocardial ischemia.

No rebound effect is noted when dexmedetomidine infusion is discontinued after 24 hours.

CLINICAL USES

INTENSIVE CARE UNIT

It is used for sedation in mechanically ventilated patient. But vigilant monitoring of patients vitals and respiration is needed.

It is used in the withdrawal syndrome of alcohol, narcotics and benzodiazepines as it does not have dependence and tolerance.

F.D.A recommended the use of dexmedetomidine infusion for 24 hours or less.

ANAESTHESIA

Used in attenuation of stress response in laparoscopic procedures.

Used as a premedication in reducing the stress response to intubation and also to attenuate intra op stress response where major hemodynamic fluctuation is anticipated as such in case of hyperthyroidism , pheochromocytoma and in coronary heart disease patients.

Average infusion required to maintain the B.I.S value of 70-80 is 0.7mcg/kg/hr.

It reduces the intra op requirement of opiods and analgesic requirement by around 50%.

It reduces the MAC of volatile agents.

SIDE EFFECTS

- Bradycardia and hypotension if given in large doses (>1mcg/kg) or in rapid infusion rate (< 10 min)
- Hypertension if loading dose is given more than 1mcg/kg
- Dry mouth due to reduction in saliva secretion

RETRO BULBAR BLOCK

It is a regional anesthetic nerve block where local anesthetics loaded in a syringe is injected in the retro bulbar space that is behind the globe of eye. This block produces akinesia of extra ocular muscles by blocking cranial nerves ll, lll, Vl thus movement of the globe is prevented. Cranial nerve lV which is present outside the muscle cone also gets blocked due to local anesthetics diffusion. Further it blocks ciliary nerves so that sensation to conjunctiva, cornea and uvea is lost. This block is most frequently used in cataract surgery and also in other intraocular surgeries.

Technique

Before commencing the technique, resuscitation instrument, careful observation and assistant help must be available . Patient is placed in sitting or supine position with the head in neutral position. A 22-27 gauge, 3cm long needle with syringe loaded with local anesthetics is given at inferolateral border of bony orbit, goes backwards till reaches centre of the globe and then have to pass medially towards the apex of orbit. If some restriction is felt when the needle tip is passed through the muscle cone , stop moving the needle. After aspirating for blood, local anesthetics is injected and needle is taken out. Usually 2% lidocaine and/or 0.5% - 0.75% bupivacaine are used as local anesthetics. Avoid

mixing LA with epinephrine for vasoconstriction, as it can possibly lead to central retinal artery occlusion. Often an enzyme, hyaluronidase is used with LA as it fastens the spread and action of the drug. If akinesia and anesthesia occurs quickly in minutes then the block is successful. This block can be used in corneal transplantation but it may additionally require facial nerve block. It does not block orbicularis oculi muscle.

Adverse Effects and Complications

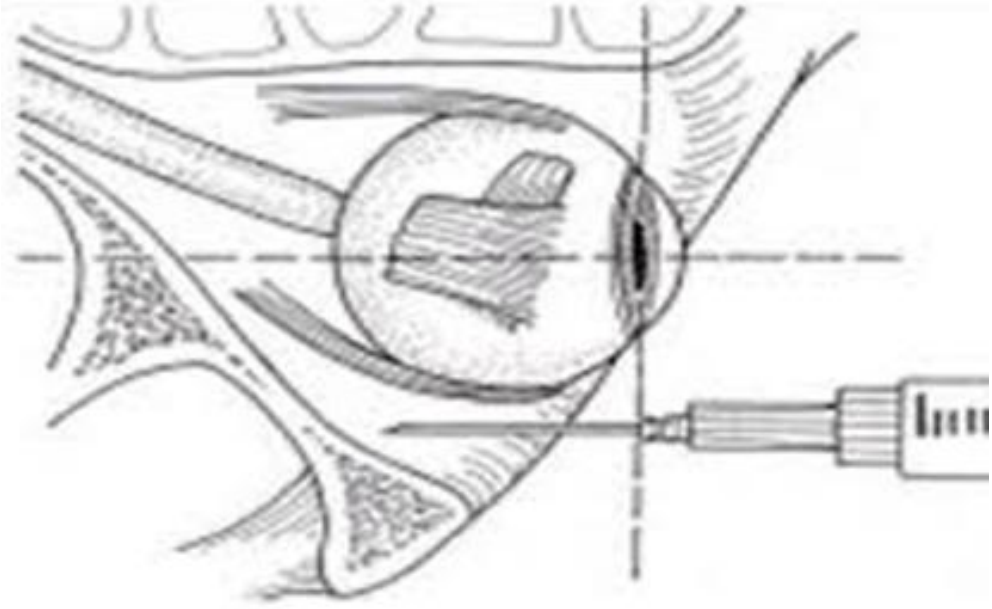
It may be local or systemic. The local ocular effects are development of hematoma, damage to optic nerve, and any perforation injury to the globe ultimately leading to blindness.

Systemic effects-

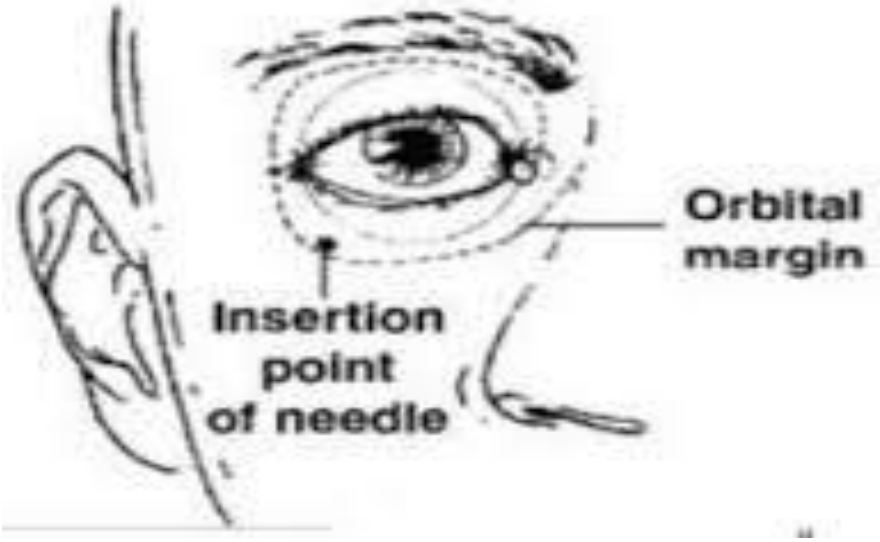
Toxicity of local anesthesic drug can occur. Injury to brainstem may also happen. Stimulation of oculocardiac reflex.

Other than that patient feels uncomfortable during the technique because of needle sensation. Recently peribulbar block has been increasingly used to reduce these complications

RETROBULBAR BLOCK



Needle outside the muscle cone



REVIEW OF LITERATURE

HASEN KV et all[38]

A Retrospective study was conducted in 85 Patients in which the hospital records of all 85 patients were collected. Patients undergoing aesthetic procedures were included and the surgery was performed under intravenous sedation. The author had a hypothesis that the difference in the outcome parameters was not significant between the groups. All records of patients undergoing surgery under a conscious sedation using intravenous midazolam and fentanyl were evaluated and compared with the second group who undergo aesthetic surgery using propofol infusion.. A questionnaire evaluating operative and peri operative outcome such as pain, nausea, vomiting and anxiety were analysed. No significant statistical difference exists between the groups regarding aesthetic procedure, duration of procedure and ASA grouping between the groups. Hypotension was observed in the propofol group but no patient required intensive treatment other than just reducing the dose of sedative agent and increasing i.v fluids. The amount of rescue analgesic needed was higher in propofol group when compared to midaz/fentanyl group. “Recall of unpleasant intraoperative agents” were higher in midaz/fentanyl group when compared to other group (17 percent versus 3 percent, p = 0.007). No significant difference in the intraoperative pain, nausea and anxiety

between the groups. The propofol group experienced significantly more nausea in the recovery room (p = 0.002), nausea at the time of discharge (p = 0.009), and nausea the evening after the operation (p = 0.013).patient satisfaction appears to be same in both the groups. This study concluded that there no difference is found to exist the sedative agents used and they have better safety profile for its use in aesthetic procedures.

ROLO.R et al[(36)]

This study compared the effect of midazolam as a sedative in bronchoscopy when compared to that of placebo group.

A randomised double blind prospective trial was done in 100 patients who underwent fibre optic bronchoscopy (F.O.B) .Two groups were assigned. Midazolam was given to patients in Group 1 in a dose of 0.05mg/kg and saline solution was given to Group 2.. Patient anxiety level was evaluated with The Hospital Anxiety and Depression Scale (HADS-A). Patient's main concern like fear and apprehension were evaluated both before and after the procedure using a subjective questionnaire.

The results of the study were there is significant increase in intraoperative blood pressure in group 1 when compared to group 2 (p – 0.003). Incidence of cough and dyspnoea were reduced in group 1 when

compared to group 2. Incidence of nausea and pain in the immediate post operative period had no significant difference

This study concluded that midazolam has better patient comfort and tolerance than place Bo group during the procedure of fibre optic bronchoscopy .Hence it can be used for sedation in F.O.B with a good safety profile and with lesser incidence of complication.

Waleed M.A.Al Taher et al.,[37]

A study was conducted in 60 paediatric patient who underwent dental procedures as an outpatient procedure in dentistry department. All children belonged to the age group between 4 and 10 years.

Group I received dexmedetomidine in a dose of 1μg/kg over 15min followed by maintenance infusion of 0.45μg/kg/h . Group II was given midazolam 0.04 mg/kg and propofol as 1 mg/kg over 10 min followed by 4 mg/kg as maintenance infusion. Vitals parameters such as heart rate, blood pressure, SPO2 and respiratory rate were measured every 5 min. Onset of the sedation, duration of procedure, recovery profile, time for rescue analgesia evaluated.

Result of the study showed that time for the onset of sedation was prolonged in groupI. Recovery time was shorter in dexmedetomidine group when compared to that of midaz+propofol group. The dose of rescue analgesic is also reduced in group I .

Study showed dexmedetomidine is safer in paediatric patients and can be used as sedation for dental procedures.

Patients who were given dexmedetomidine were found to be associated with faster recovery when compared to that of the patients who received the combination of midazolam and propofol.

CHAMORRO et al.,

The study compared the effectiveness of propofol and midazolam in the sedation of mechanically ventilated patient in the intensive care unit. 97 patients who required mechanical ventilation for medical problems and needed sedation for a minimum of 48 hours and a maximum of 5 days were included. Propofol was given as 2mg/kg and midazolam as 0.2mg/kg. 1.8mg/kg/hr of propofol and 0.2 mg/kg/hr of midazolam given as maintenance dose. All the patients were monitored continuously for blood pressure, pulse rate, SPO2.Patients were noted for the signs of ventilator asynchrony like agitation, increase in heart rate, increase in airway pressure and abnormal restless movements.

In the results of the study there was no significant difference in the requirement of opiod and muscle relaxant. Patient ventilator synchrony was better with propofol when compared to that of midazolam. Patient given propofol awake more rapidly than midazolam ((23 +/- 16 mins vs. 137 +/- 185 mins, respectively, $p < .05$).

Incidence of hypotension was more with propofol than midazolam during maintenance period and it required the reduction of propofol infusion rate and increase in intra venous fluid administration.

The conclusion of this study is that both propofol and midazolam is effective for sedation of mechanically ventilated patients in I.C.U with propofol having the advantage of prompt recovery and midazolam having the advantage of lesser incidence of hypotension.

PRIYANKA SETHI et al.,

A randomised controlled trial was done to compare the effect of midazolam and dexmedetomidine as a conscious sedation in retrograde cholangio pancreatography.The study was conducted in 60 patients whose age group range between 18-40 years.

Group M was given midazolam as 0.03mg/kg iv and supplementation of 0.5mg given until they attain Ramsay sedation scale of 3. Group D received inj.dexmedetomidine 1mcg/kg iv and maintenance infusion of 0.5mcg/kg/hr iv was given until they reach a Ramsay sedation score of 3. All the patients received inj.fentanyl 1mcg/kg. Vital parameters like blood pressure, pulse rate, facial pain scale, time to attain the Ramsay sedation score of 3 has been studied in all two groups during and after the procedure. Time to attain the Aldrete recovery score of 9-10 and surgeon satisfaction scale had been evaluated

in the recovery room. Incidence of complication during and after the procedure was also noted.

Study showed that blood pressure and F.P.S dose was lower with dexmedetomidine than with group M.There was no significant difference in P.R and respiratory rate between the groups. The Aldrete score of 9 was achieved sooner in group D .than group M. satisfaction scale given by surgeon was better with group D. Group D also had higher patient satisfaction scale.

The study concluded that both midazolam and dexmedetomidine is effective as conscious sedation in E.R.C.P procedures and dexmedetomidine is found to be slightly superior in its effects when compared to midazolam.

RICHARD.R.RIKER et al.,

Double blind prospective randomised trial was done in 68 hospitals in 370 medical and surgical patients in the I.C.U . Richmond Agitation Sedation Scale and Confusion Assessment Method were used.

Midazolam was given as 0.02-0.15mg/kg /hr and dexmedetomidine was given in the dose of 0.2-1.0mcg/kg/hr and the dose was titrated till the patients attained the RASS score between -2 to +1 from the time of enrolment to extubation. Time to achieve the target RASS score, delirium, ICU stay duration and adverse effects were measured as parameters

No difference in the time to achieve the target RASS score was noted between groups .Incidence of delirium is higher in midazolam group. Length of ICU stay was also lower in dexmedetomidine group when compared to midazolam group. Group D showed higher incidence of bradycardia when compared to group M but non significant proportion of people only required treatment.

The results of the study concluded that there was no difference between the groups for attaining the target level of sedation in mechanically ventilated patients in I.C.U. However dexmedetomidine group experienced lesser incidence of delirium, better ventilator synchrony and lesser incidence of hypertension and tachycardia when compared to that of midazolam group. But the disturbing adverse effect which occurs with the use of dexmedetomidine is bradycardia.

DHARA A. VYAS et al.,

This study evaluates the effect of dexmedetomidine and midazolam which is used as sedation and its effect on hemodynamics during modified radical mastoidectomy and tympanoplasty. 50 patients were studied and divided into two groups.

Group D was given Dexmedetomidine as 1µg/kg over 20 min followed by the maintenance infusion as 0.5µg/kg/hr and Group M was given as Midazolam 0.05 mg/kg i.v. followed by the maintenance dose of 0.01mg/kg/hr .vital parameters like blood pressure ,sedation level and

heart rate were monitored. Satisfaction of patient and surgeons were monitored using Likert scale No difference observed between the two groups with regard to sedation level. There was no difference in the diastolic pressure between the groups. But the satisfaction scale given by surgeon and patient was higher in group D. Heart rate was lower in group D than that of group M.

The study concluded that dexmedetomidine can be safely used as an alternative to midazolam for sedation in E.N.T procedures.

DAVIES FC[1], WATERS M et al.,

This study compares the safety and efficacy of two doses of oral midazolam and the drug induced amnesia was assessed when given as a conscious sedation for children who undergo minor procedures in the accident and trauma centre.

A prospective, double blinded, randomised trial was done which compares 0.2 mg/kg midazolam suspension with that of 0.5 mg/kg which was a higher dose. Children whose parents give consent for sedation of minor procedures were selected. Anxiety of the patient was assessed using physiological parameters, behavioural anxiety score, parental visual analogue scale, and a telephone questionnaire at 2-7 days after the procedure.

The study concluded that oral midazolam appears to be safe in the dose of 0.5mg/kg and is effective in the sedation of children who undergo minor procedures in trauma care and it can be considered by A&E departments who are dealing with paediatric patients

OBJECTIVES OF THE STUDY

The objectives of the study was

- To evaluate the advantage of conscious sedation in cataract surgeries which is done with retro bulbar block
- To compare the effects of midazolam and dexmedetomidine in conscious sedation

The anaesthetic efficacy regarding

1) Anxiolysis of the patient
2) Patient's cooperation
    - In the placement of retro bulbar block and
    - During the procedure
3) Hemodynamic stability
4) Satisfaction of the surgeon
5) Recovery profile of the drugs and
6) Incidence of complications
    - were noted and compared

MATERIALS AND METHODS

After getting approval from the ethics committee prospective randomised double blind control trial was carried out in 90 patients.

Informed written consent was obtained from the patient

Patients randomly divided into 3 groups by draw of lots

Group M-Patients received midazolam

Loading dose-0.03mg/kg over 10 min

Maintenance dose-0.05mg/kg/hr

Group D-Patients received dexmedetomidine

Loading dose-0.3mcg/kg over ten min

Maintenance dose-0.3mcg/kg/hr

Group C-control

Loading and maintenance dose is given as plain N.S infusion

All patients are kept N.P.O for six hours

For all patients age and weight were noted

In the preoperative assessment room vital parameters like pulse rate, blood pressure and baseline investigations like hemoglobin, blood sugar, urea and creatinine, CXR and E.C.G were noted.

Thorough examination of all systems and airway assessment was done in all patients.

INCLUSION CRITERIA

Patients who give informed written consent.

Patients aged between 50 to 70 years.

ASA Class I and Class II.

Patients who weigh between 50-70kgs

Duration of surgery less than 30 min

Weight between 45-75 kg

EXCLUSION CRITERIA

Hypertensive patients

Patients with renal disorders

Patients with known C.N.S disorders

Patients with C.A.D, heart block

Patients who belong to ASA III and IV

Patients with anticipated difficult airway

MATERIALS

Midazolam 5 mg ampoule

Dexmedetomidine 200 mcg ampoule

100 ml of 0.9% Normal saline

2cc syringes

18 G intravenous cannula

Infusion pump

Monitors- pulse oximeter, N.I.B.P, E.C.G

In the operating room, appropriate equipment for airway management and emergency drugs were kept ready. Patients were shifted to operating room. Monitors like pulse oximeter, N.I.B.P and E.C.G were connected. Baseline parameters like systolic and diastolic blood pressure, pulse rate and oxygen saturation were noted. All the drug preparation were made by the Post graduate colleague and both the observer and the patient didn't know the content of the preparation.

Loading dose is given to the patients. Patients who belong to group M received inj.midazolam in a dose of 0.03 mg/kg i.v and patients who belong to group D received inj.dexmedetomidine in a dose of 0.3mcg/kg over 10 min. Group C patients received plain normal saline.

Double blinding – For group M loading dose was given as 0.03mg/kg iv bolus followed by plain N.S infusion for 10 min and for group D loading dose was given as plain Normal saline iv bolus followed by infusion of 0.3 mcg/kg over 10 min.

Loading dose is followed by retro bulbar block after 10 min.

Peribulbar block was given with a mixture of inj .bupivacine 0.5% 2.5cc and inj.lignocaine 2% 2.5 cc.

Surgery was started at the end of 10 min when loading dose was completed.

Maintenance dose was given as infusion till the procedure ends. Group M patients were infused with inj.midazolam 0.05 mg/kg/hr i.v in 100 ml N.S and Group D Patients were infused with inj.dexmedetomidine 0.3mcg/kg/hr i.v in 100 ml N.S. Group C patients received plain normal saline infusion.

Supplemental oxygen will not be provided except in case of desaturation (SPO2-95%)[21]. Atropine is given if heart rate falls below 50/min.

If M.A.P falls below 30% of baseline intra venous fluids would be rushed. Ionotrophic drugs were kept ready.

PARAMETERS MONITORED[14,15,16]

- Baseline B.P, Pulse rate, SPO2.
- Blood pressure, pulse rate,SPO2,R.S,S every 2 min from the time of loading dose to the time the surgery was started.
- Wong Baker Facial pain rating scale at the time of retrobulbar block [4]
- Intra op vitals-B.P, pulse rate, E.C.G, SPO2 every 5 min
- Ramsay sedation score every 1 min from the time of loading dose till they attain the Ramsay sedation score of 3 and every 5 min there after
- Patient movement scale during surgery

- Aldrete recovery score every min after the end of surgery and time to attain the score of 10 was recorded.[11].
- Patient was shifted to recovery room after they attain a Aldrete recovery score of 10
- Likert like verbal rating of surgeon's satisfaction at the end of surgery
- Patient will be asked whether they were aware of 'unpleasant intraoperative events' in the post operative period
- Post op vitals and Ramsay sedation score every 10 min for 2hrs in the post op period

FACIAL PAIN RATING SCALE

0 – NO HURT

1 – HURTS LITTLE

2- LITTLE MORE HURT

3- HURTING EVEN MORE

4- HURTS A LOT

5- HURTS WORST

This parameter is measured at the time of retro bulbar block

Retro bulbar block is given at the end of the loading dose

Patient's pain scale is numbered based on their facial expression at the time of giving the block

RECALL OF INTRA OPERATIVE EVENTS

Patients will be enquired whether

1) They were able to hear the conversation of nurses and surgeon while operating
2) Whether they were aware of the events like moving their body and turning their head
3) Whether they were able to recollect a standard music which was played intra operatively

   Patients who were able to recall any one of the above was considered to say as ‘YES’

   Patients who were not able to recall all of the above is considered as ‘NO’

RAMSAY SEDATION SCORE

1 – anxious, agitated

2 – Co operative, tranquil

3 – Response to verbal commands.pt will be asleep but arousable

4- Brisk response to light glabellar tap

5- Mild response to light glabellar tap

6 – No response

Ramsay sedation score is measured every 3 min from the time of loading dose till the end of surgery and every 5 min in the post operative period for two hours

PATIENTS MOVEMENT SCALE DURING SURGERY

1-No movement

2-Movement with slight effect on surgical field(less than ½ of eye outside the microscope)

3-Movement with moderate effect (more than ½ of eye outside the microscope)

4-Movement with major effect (whole eye outside the microscope)

This parameter was noted by the observer in the television which showed the events which was recorded in the operative microscope.

This was observed till the end of the procedure.

ALDRETE RECOVERY SCALE[11]

Chart 1. The 'modified' Aldrete Scale

RESPIRATION	2	1	0
	Able to take deep breath and cough	Dyspnea/Shallow Breathing	Apnea
O2 SATURATION	2	1	0
	Maintains > 92% on room air	Needs O2 inhalation to maintain O2 saturation > 90%	Saturation < 90% even with supplemental O2
CONSCIOUSNESS	2	1	0
	Fully awake	Arousable on calling	Not responding
CIRCULATION	2	1	0
	BP ± 20mmHg pre op	BP ± 20-50mmHg pre op	BP ± 50mmHg pre op
ACTIVITY	2	1	0
	Able to move 4 extremities voluntarily or on command	Able to move 2 extremities voluntarily or on command	Able to move 0 extremities voluntarily or on command

Time to attain the Aldrete recovery score of 10 from the end of surgery was recorded

Likert like verbal rating scale [9,12]

1- Dissatisfied extremely

2- Not satisfied

3- Satisfied to some extent

4 – unable to decide

5- Satisfied to Some extent

6- Satisfied by the subject

7-satisfied extremely

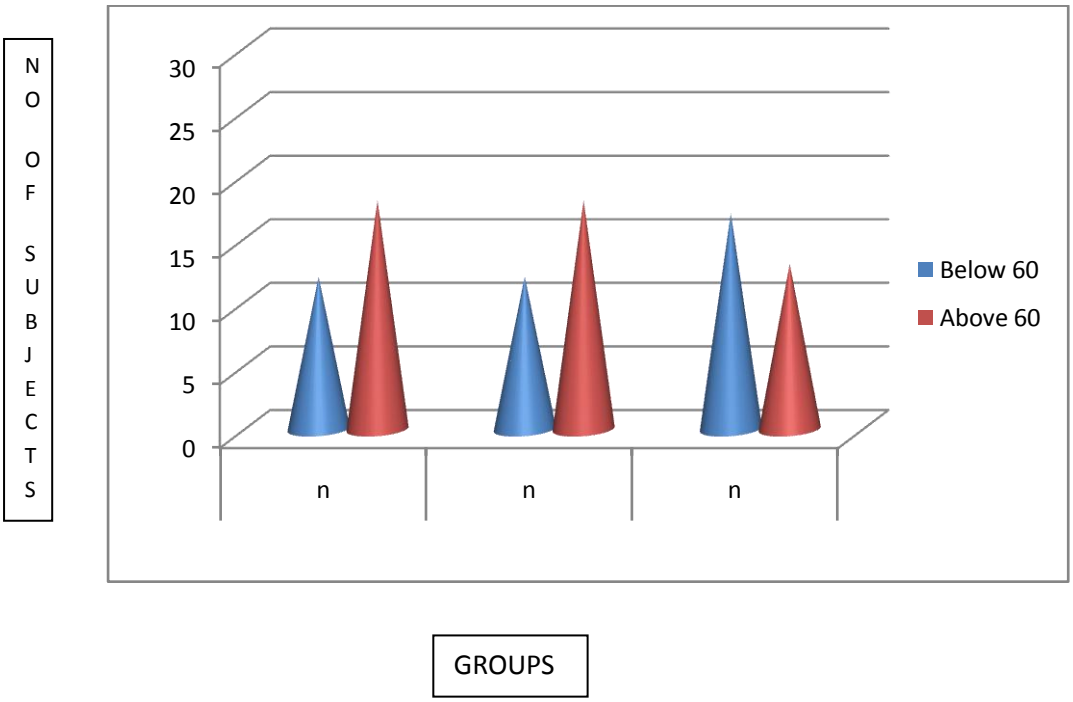
This parameter was measured by asking the surgeon to rate the level of his satisfaction as a numerical from 1 to 7

OBSERVATION AND RESULTS

AGE DISTRIBUTION

AGE	GROUP	Mean ± Standard Deviation	t-value	p-value
	CONTROL GROUP M	60.83±4.54 61.56±4.86	0.6	0.5504(not significant)
	GROUP M GROUP D	61.56±4.86 60.134±4.89	0.261	0.2610(not significant)
	GROUP D CONTROL	60.134±4.89 60.83±4.54	0.2068	0.8369(not significant)

AGE DISTRIBUTION AMONG GROUPS



The mean age group of group M is 61.56, group D is 60.13, and control group is 60.83.

P value – Between group M and group D = 0.261 (not significant)

Between control and group M =0.55(not significant)

Between group D and control =0.8369(not significant)

All the three groups are comparable in terms of age

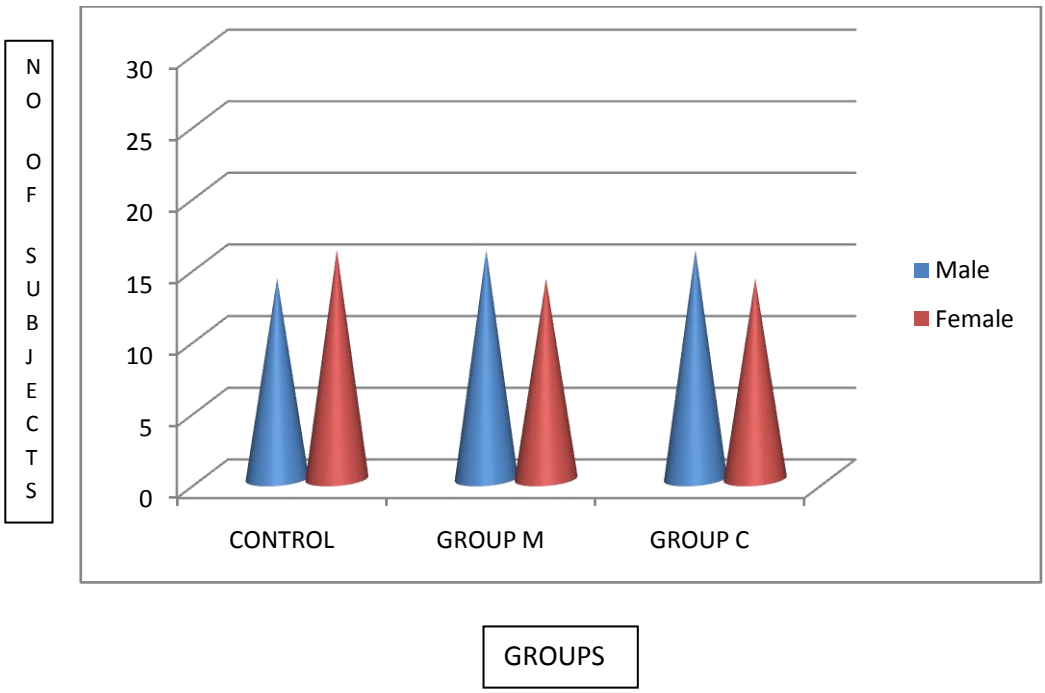
SEX DISTRIBUTION

SEX	Control		Group M	
	n	%	N	%
Male	14	46.7%	16	53.3%
Female	16	53.3%	14	46.7%
Chisquare value	0.2667			
Df	1			
p-value	0.655(not significant)			

SEX	Group M		Group D	
	n	%	N	%
Male	16	53.3%	16	53.3%
Female	14	46.7%	14	46.7%
Chisquare value	0			
Df	1			
p-value	1(not significant)			

SEX	Group D		Control	
	n	%	N	%
Male	14	46.7%	16	53.3%
Female	16	53.3%	14	46.7%
Chisquare value	0.2667			
Df	1			
p-value	0.655(not significant)			

SEX DISTRIBUTION BETWEEN GROUPS



The percentage of male patients in group M is 53.3%, group D is 53.3%, and control group is 46.7%.

The percentage of female patients in group M is 46.7%, group D is 46.7%, and control group is 53.3%

P value – between group M and group D = 1 (not significant)

Between control and group M =0.655(not significant)

Between control and group D =0.655(not significant)

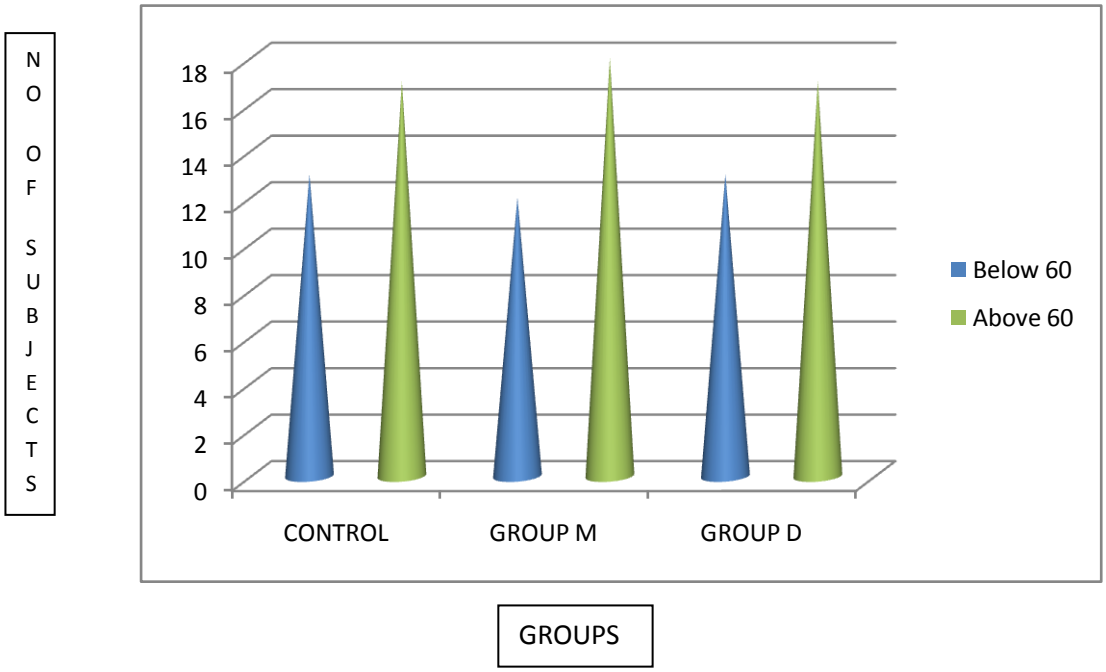
All the three groups are comparable in terms of sex

WEIGHT DISTRIBUTION

Weight		Mean ± Standard Deviation	t-Value	p-Value
	CONTROL GROUPM	61.23±5.55 61.66±5.39	0.3044	0.7619(not significant)
	GROUP M GROUP D	61.66±5.39 61.3±6.17	0.2422	0.8095(not significant)
	GROUP D CONTROL	61.3±6.17 61.23±5.55	0.0462	0.9733(not significant)

WEIGHT DISTRIBUTION AMONG GROUPS

(Comparing Weight As Below 60 kg and above 60 kg)



The mean weight of group M is 61.23, group D is 61.66, and control group is 61.3

P value – between group M and group D = 0.7619 (not significant)

Between control and group M =0.8095(not significant)

Between group D and control =0.9733(not significant)

All the three groups are comparable in terms of weight

ASA STATUS DISTRIBUTION

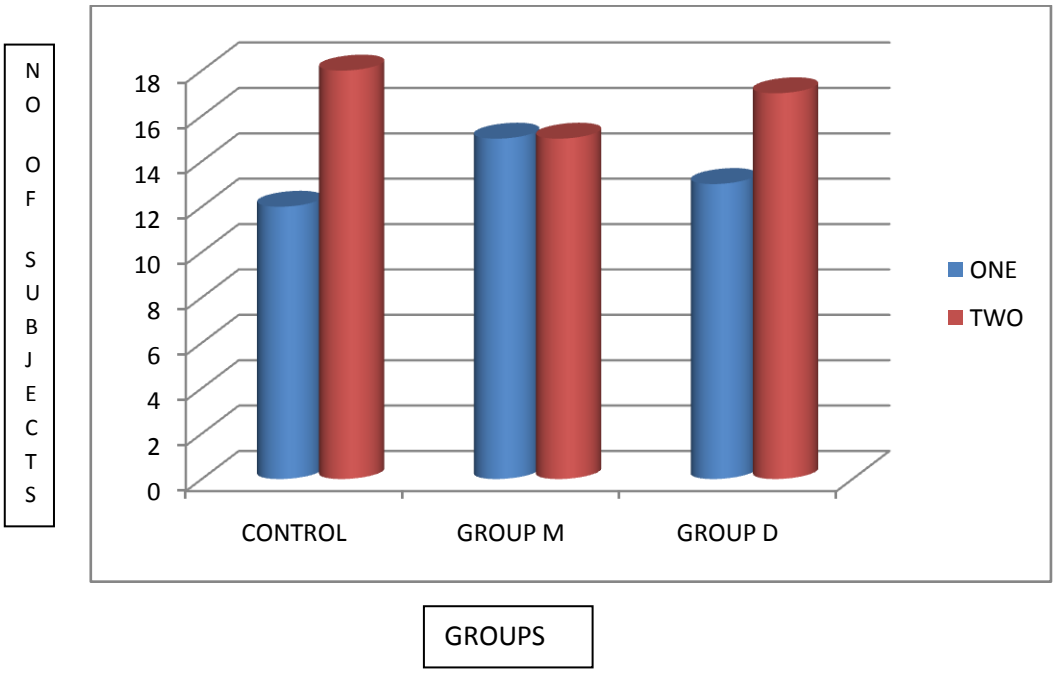
ASA STATUS	CONTROL (n=30)		GROUP M(n=30)	
	N	%	n	%
ONE	12	40.0%	15	50.0%
TWO	18	60.0%	15	50.0%
Chi square value	0.6061			
Df	1			
p value	0.436(not significant)			

ASA STATUS	GROUP M(n=30)		GROUP D(n=30)	
	n	%	n	%
ONE	15	50.0%	13	43.3%
TWO	15	50.0%	17	56.7%
Chi square value	0.2679			
Df	1			
p value	0.604(not significant)			

ASA STATUS	GROUP D		CONTROL	
	n	%	n	%
ONE	13	43.3%	12	40.0%
TWO	17	56.7%	18	60.0%
Chi square value	0.006			
Df	1			
p value	0.9736(not significant)			

ASA DISTRIBUTION AMONG GROUPS

(Comparison between the distribution of ASA I and ASA II between groups)



The percentage of ASA I patients in group M is 50 %, group D is 43.3%, control group is 40%

The percentage of ASA II patients in group M is 50%, group D is 56.7%, and control group is 60%

p value – between group M and group D =0.604 (not significant)

Between control and group M =0.43(not significant)

Between control and group D =0.97(not significant)

All the three groups are comparable in terms of ASA status

SYSTOLIC BLOOD PRESSURE

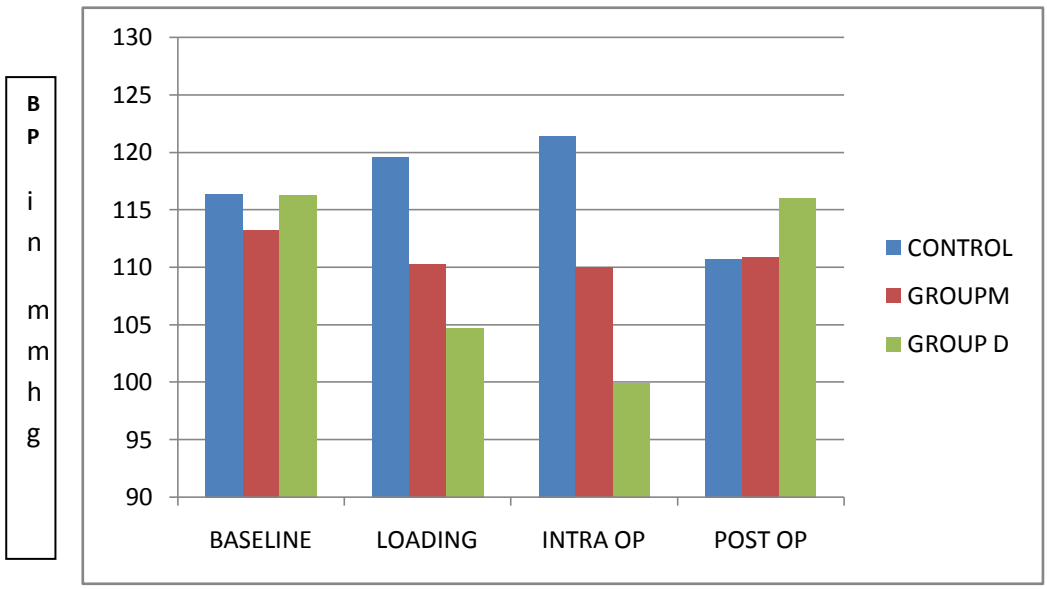
Baseline		Mean ± Standard Deviation	t-value	p-value
	CONTROL GROUP M	116.37±9.469 113.23±5.021	1.6032	0.1139(not significant)
	GROUP M GROUP D	113.23±5.021 116.3±9.535	1.5604	0.1241(not significant)
	GROUP D CONTROL	116.3±9.535 116.37±9.469	0.0285	0.9773(not significant)

Loading Dose		Mean ± Standard Deviation	t-value	p-value
	CONTROL GROUP M	119.6±9.981 110.31±6.292	4.3437	<0.0001(significant)
	GROUP M GROUP D	110.3±6.292 104.7±12.13	2.2486	0.0283(significant)
	GROUP D CONTROL	104.7±12.13 119.6±9.881	5.2164	<0.0001(significant)

Intraop		Mean ± Standard Deviation	t-value	p-value
	CONTROL GROUP M	121.433±10.59 110.394±6.577	4.8496	<0.0001(significant)
	GROUP M GROUP D	110.394±6.57 99.96±9.06	5.0997	<0.0001(significant)
	GROUP D CONTROL	99.96±9.06 121.433±10.59	8.3436	<0.0001(significant)

Postop		Mean ± Standard Deviation	t-value	p-value
	CONTROL GROUP M	110.7±6.609 110.99±4.92	0.1880	0.8515(not significant)
	GROUP M GROUP D	110.99±4.92 116.06±37.6	0.7310	0.4677(not significant)
	GROUP D CONTROL	116.06±37.6 110.7±6.609	0.7710	0.4438(not significant)

SHOWING DIFFERENCE IN MEAN SYSTOLIC BLOOD PRESSURE BETWEEN GROUPS



GROUPS SHOWING MEAN SYSTOLIC B.P

- Mean systolic baseline B.P is 113.23(mm of hg) in group M, 116.3(mm of hg) in group D and 116.37 (mm of hg) in control group. p-values between group M and D, group M and control, group D and control are 0.1139, 0124, 0.97 respectively which are statistically not significant to each other.
- Mean systolic B.P during loading dose administration is 110.3(mm of hg) in group M, 104.7(mm of hg) in group D and 119.6(mm of hg) in control group. p-values between group M and D, group M and control, group D and control are 0.02836,< 0.0001, and < 0.0001 respectively which are statistically significant to each other.
- Mean systolic B.P during intra op period is 110.39(mm of hg) in group M, 99.96 (mm of hg) in group D and 119.6 (mm of hg) in control group. p-values between group M and D, group M and control, group D and control are <0.0001,< 0.0001, <0.0001 respectively which are statistically significant to each other.
- Mean systolic B.P during post op period is 110.9(mm of hg) in group M, 110.7(mm of hg) in group D and 116.06 (mm of hg) in control group. p-values between group M and D, group M and control, group D and control are 0.46, 0.85, 0.44 respectively which are statistically not significant to each other.

MEAN ARTERIAL BLOOD PRESSURE

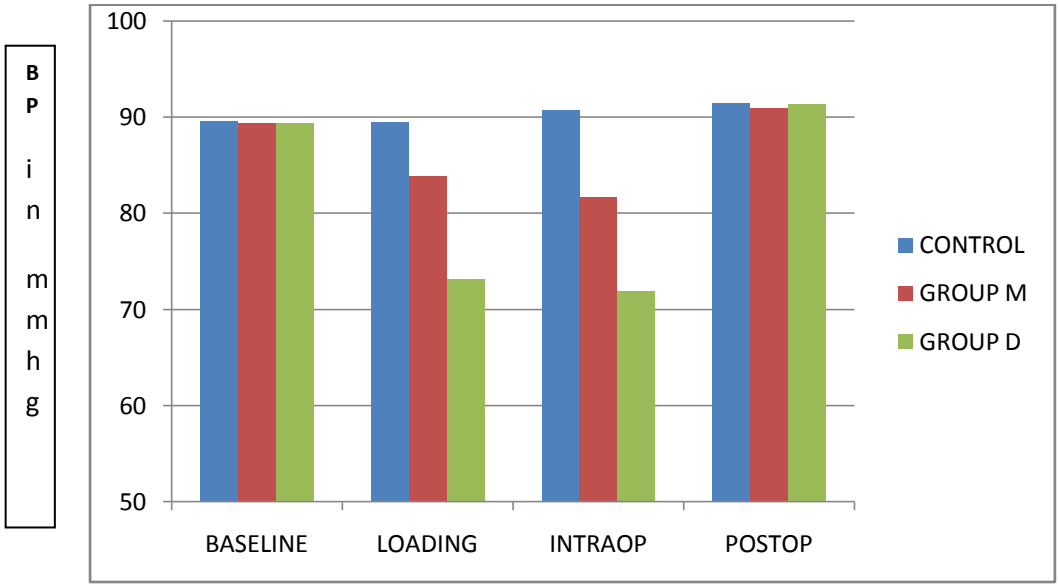
Baseline		Mean ± Standard Deviation	t-value	p-value
	CONTROL GROUP M	89.58±3.49 89.3±4.33	0.19	0.84(not significant)
	GROUP M GROUP D	89.3±4.33 89.39±3.95	0.084	0.93(not significant)
	GROUP D CONTROL	89.39±3.95 89.95±3.49	0.20	0.83(not significant)

Loading Dose		Mean ± Standard Deviation	t-value	p-value
	CONTROL GROUP M	89.5±3.49 83.9±3.55	6.16	<0.0001(significant)
	GROUP M GROUP D	83.9±3.55 73.19±1.86	14.63	<0.0001(significant)
	GROUP D CONTROL	73.19±1.86 89.5±3.49	22.5	<0.0001(significant)

Intraop		Mean ± Standard Deviation	t-value	p-value
	CONTROL GROUP M	91.5±2.80 90.87±2.91	16.35	<0.0001(significant)
	GROUP M GROUP D	90.87±2.91 91.32±3.00	20.41	<0.0001(significant)
	GROUP D CONTROL	91.32±3.00 91.5±2.80	53.2	<0.0001(significant)

Postop		Mean ± Standard Deviation	t-value	p-value
	CONTROL GROUP M	91.5±2.88 90.87±2.91	0.40	0.55(not significant)
	GROUP M GROUP D	90.87±2.91 91.32±3.00	0.57	0.84(not significant)
	GROUP D CONTROL	91.32±3.00 91.5±2.88	0.23	0.81(not significant)

SHOWING DIFFERENCE IN MEAN ARTERIAL BLOOD PRESSURE BETWEEN GROUPS



GROUPS SHOWING MEAN ARTERIAL B.P

- Mean baseline M.A.P is 89.39(mm of hg) in group M, 89.3(mm of hg) in group D and 89.58 (mm of hg) in control group. p-values between group M and D, group M and control, group D and control are 0.93, 0.84, 0.83 respectively which are statistically not significant to each other
- Mean M.A.P during loading dose administration is 83.9(mm of hg) in group M, 73.19(mm of hg) in group D and 89.5(mm of hg) in control group. p-values between group M and D, group M and control, group D and control are <0.0001,< 0.0001, and <0.0001 respectively which are statistically significant to each other
- Mean M.A.P during intra op period is 81.6(mm of hg) in group M, 71.85 (mm of hg) in group D and 90.72 (mm of hg) in control group. p-values between group M and D, group M and control, group D and control are <0.0001, <0.0001, <0.0001 respectively which are statistically significant to each other
- Mean M.A.P during post op period is 90.87(mm of hg) in group M, 91.32(mm of hg) in group D and 91.5 (mm of hg) in control group. p-values between group M and D, group M and control, group D and control are 0.55, 0.84, 0.81 respectively which are statistically not significant to each other.

PULSE RATE

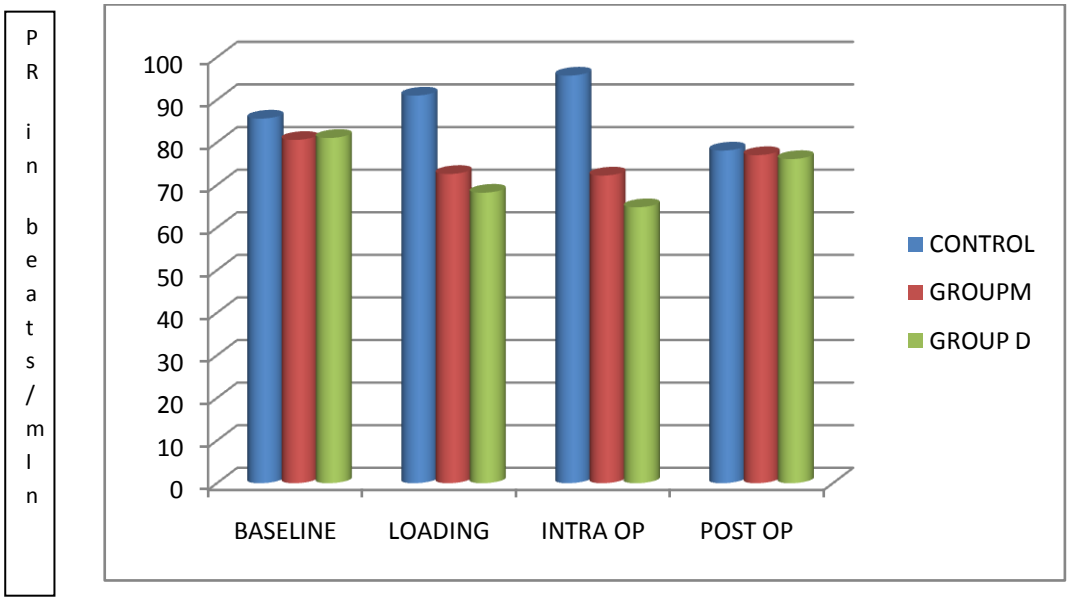
Baseline		Mean ± Standard Deviation	t-value	p-value
	CONTROL GROUP M	85.6±12.65 80.6±6.605	1.919	0.06(not significant)
	GROUP M GROUP D	80.6±6.605 81.06±5.63	0.2903	0.7726(not significant)
	GROUP D CONTROL	81.06±5.63 85.6±12.65	1.5875	0.1178(not significant)

Loading Dose		Mean ± Standard Deviation	t-value	p-value
	CONTROL GROUP M	91.0±7.51 72.63±5.92	10.896	<0.0001 (significant)
	GROUP M GROUP D	72.63±5.92 68.2 ±4.37	1.5858	0.0017 (significant)
	GROUP D CONTROL	68.2±4.37 91.0±7.51	5.67	<0.0001 (significant)

Intraop		Mean ± Standard Deviation	t-value	p-value
	CONTROL GROUP M	95.7±7.27 72.23±5.91	13.72	<0.0001 (significant)
	GROUP M GROUP D	72.23±5.91 64.79±5.88	4.88	<0.0001 (significant)
	GROUP D CONTROL	64.79±5.88 95.7±7.27	30.91	<0.0001 (significant)

Postop		Mean ± Standard Deviation	t-value	p-value
	CONTROL GROUP M	78.1±2.71 77.02±3.22	1.4055	0.1652 (not significant)
	GROUP M GROUP D	77.02±3.22 76.1±6.28	0.7140	0.4781 (not significant)
	GROUP D CONTROL	76.1±6.28 78.1±2.71	0.2924	0.7710 (not significant)

SHOWING DIFFERENCE IN PULSE RATE BETWEEN THE GROUPS



GROUPS SHOWING MEAN PULSE RATE

- Mean baseline pulse rate is 80.6 in groups M, 81.06 in group D and 85.6 in control group. p-values between group M and D, group M and control, group D and control are 0.77, 0.06, 0.11 respectively which are statistically not significant to each other.
- Mean pulse rate during loading dose administration is 72.63 in groups M, 68.2 in group D and 91.0 in control group. p-values between group M and D, group M and control, group D and control are 0.0017, <0.0001, <0.0001 respectively which are statistically significant to each other.
- Mean pulse rate during intra op period is 72.23 in groups M, 64.79 in group D and 95.7 in control group. p-values between group M and D, group M and control, group D and control are <0.0001, <0.0001, <0.0001 respectively which are statistically significant to each other.
- Mean pulse rate during post op period is 77.02 in groups M, 76.1 in group D and 78.1 in control group. p-values between group M and D, group M and control, group D and control are 0.47, 0.16, 0.77 respectively which are statistically not significant to each other.

Sp02

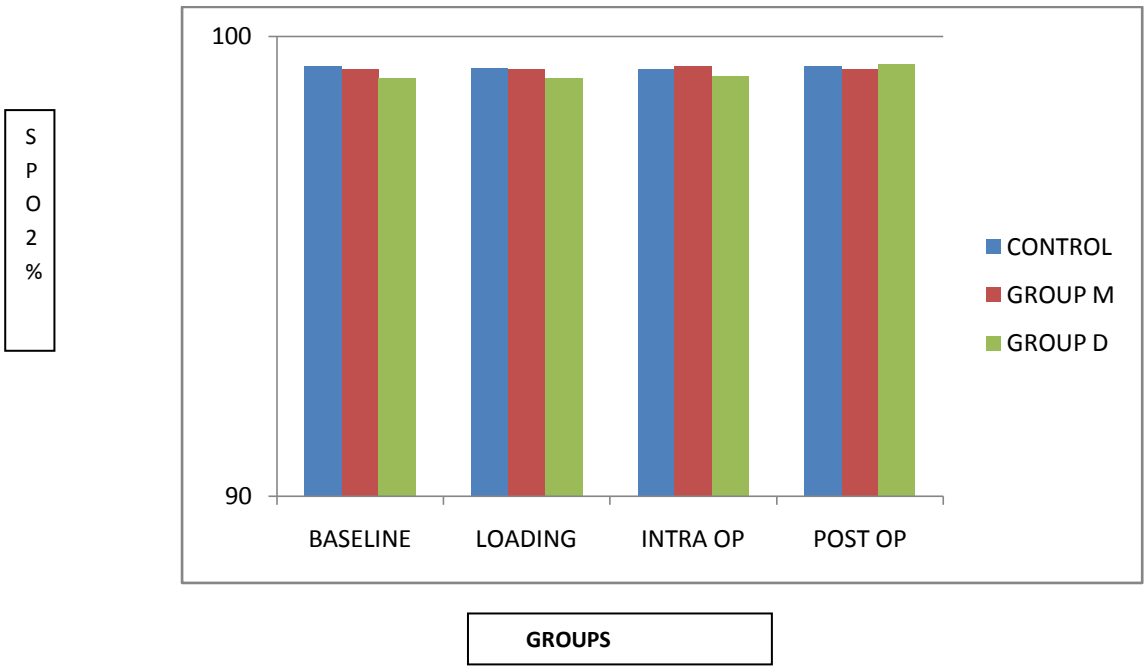
Baseline		Mean ± Standard Deviation	t-value	p-value
	CONTROL GROUP M	99.37±0.49 99.30±0.46	0.567	0.5729(not significant)
	GROUP M GROUP D	99.30±0.46 99.26±0.44	0.7724	0.2904(not significant)
	GROUP D CONTROL	99.26±0.44 99.37±0.49	0.865	0.3906(not significant)

Loading Dose		Mean ± Standard Deviation	t-value	p-value
	CONTROL GROUP M	99.31±0.49 99.3±0.46	0.5402	0.5911(not significant)
	GROUP M GROUP D	99.3±0.46 99.1±0.44	1.6236	0.1099(not significant)
	GROUP D CONTROL	99.1±0.44 99.31±0.49	1.5802	0.1195(not significant)

Intraop		Mean ± Standard Deviation	t-value	p-value
	CONTROL GROUP M	99.3±0.46 99.36±0.49	0.4840	0.627(not significant)
	GROUP M GROUP D	99.36±0.49 99.14±0.43	1.8484	0.069(not significant)
	GROUP D CONTROL	99.14±0.43 99.3±0.46	1.8148	0.0747(not significant)

Postop		Mean ± Standard Deviation	t-value	p-value
	CONTROL GROUP M	99.36±0.49 99.3±0.46	0.486	0.6288(not significant)
	GROUP M GROUP D	99.3±0.46 99.4±0.47	0.8276	0.4113(not significant)
	GROUP D CONTROL	99.4±0.47 99.36±0.49	0.3227	0.7481(not significant)

SHOWING SPO2 DIFFERENCE BETWEEN THE GROUPS



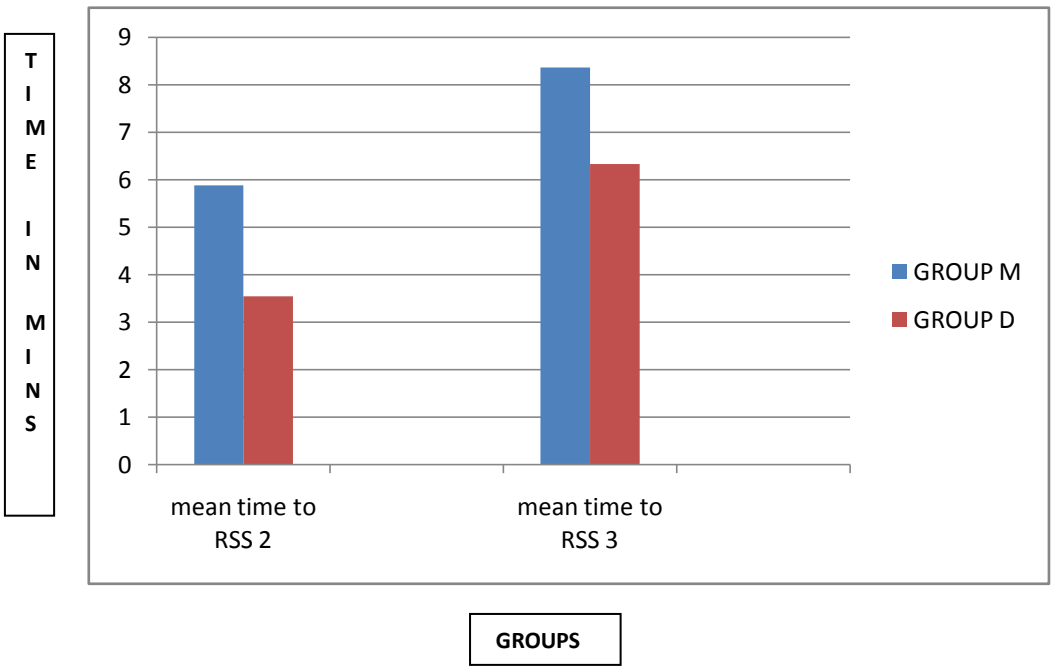
- Mean baseline SPO2 is 99.3% in group M, 99.26% in group D and 99.37% in control group. p-values between group M and D, group M and control, group D and control are 0.29, 0.39, 0.57 respectively which are statistically not significant to each other.
- Mean SPO2 during loading dose administration is 99.3% in group M, 99.1% in group D and 99.31% in control group. p-values between group M and D, group M and control, group D and control are 0.10, 0.59, 0.11 respectively which are statistically not significant to each other.
- Mean SPO2 during intra op period is 99.36% in group M, 99.14% in group D and 99.3% in control group. p-values between group M and D, group M and control, group D and control are 0.06, 0.6, 0.07 respectively which are statistically not significant to each other.
- Mean SPO2 during post op period is 99.3% in group M, 99.4% in group D and 99.36% in control group. p-values between group M and D, group M and control, group D and control are 0.41, 0.62, 0.74 respectively which are statistically not significant to each other.

RAMSAY SEDATION SCALE

Time to RSS 2	Mean ± Standard Deviation	t-value	p-value
GROUP M	5.88±1.14	8.45	< 0.0001 (Significant)
GROUP D	3.55±0.99		

Time to RSS 3	Mean ± Standard Deviation	t-value	p-value
GROUP M	8.37±0.90	9.07	< 0.0001 (significant)
GROUP D	6.33±0.84		

SHOWING MEAN TIME TO ACHEIVE RSS 2 AND RSS 3 IN TWO GROUPS



Mean time to achieve Ramsay Sedation Score of 2 in group M is 5.88 and group D is 3.55

p- value is less than 0.0001 which is statistically significant

Mean time to achieve Ramsay Sedation Score of 3 in group M is 8.37 and group D is 6.33

p- value is less than 0.0001 which is statistically significant

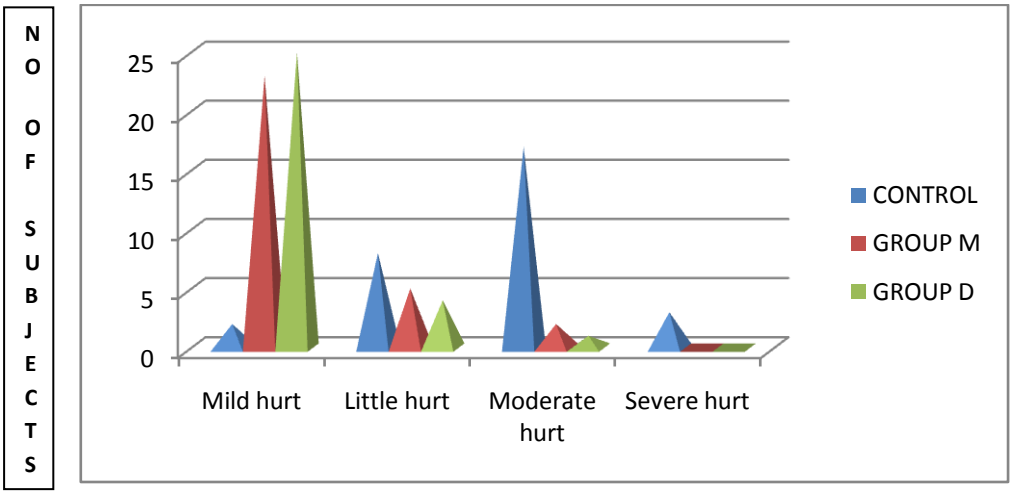
FACIAL PAIN SCALE

	CONTROL		GROUP M	
F.P.S	N	%	n	%
1-Mild hurt	2	6.7%	23	76.7%
2-Little hurt	8	26.7%	5	16.7%
3-Moderate hurt	17	56.7%	2	6.7%
4-Severe hurt	3	10.0%	0	.0%
Chi square value -30.2				
Df- 3				
p-value – <0.0001 (significant)				

	GROUP M		GROUP D	
F.P.S	n	%	n	%
1-Mild hurt	23	76.7%	25	83.3%
2-Little more hurt	5	16.7%	4	13.3%
3-Moderate hurt	2	6.7%	1	3.3%
4-Severe hurt	0	.0%	0	.0%
Chi square value – 1.635				
Df- 3				
p-value – 0.651 (not significant)				

	CONTROL		GROUP D	
F.P.S	n	%	n	%
1-Mild hurt	2	6.7%	25	83.3%
2-Little hurt	8	26.7%	4	13.3%
3-Moderate hurt	17	56.7%	1	3.3%
4-Severe hurt	3	10.0%	0	.0%
Chi square value – 38.14				
Df- 3				
p-value - <0.0001 (significant)				

SHOWING DIFFERENCE IN WONG BAKER FACIAL PAIN SCALE BETWEEN GROUPS



GROUPS SHOWING FACIAL PAIN SCALE

- The percentage of patients showing facial pain scale of 1(mild hurt) in group M is 76.7%, group D is 83.3% and control is 6.7%
- The percentage of patients showing facial pain scale of 2 (little hurt) in group M is 16.7%, group D is 13.3% and control is 26.7%
- The percentage of patients showing facial pain scale of 3(moderate hurt) in group M is 6.7%, group D is 3.3% and control is 56.7%
- The percentage of patients showing facial pain scale of 4(severe hurt) in group M is 76.7%, group D is 83.3% and control is 6.7%
- p- value
  - between group M and group D is 0.651 which is statistically not significant.
  - between control and group M is < 0.0001 which is statistically significant
  - between control and group D is <0.0001 which is statistically Significant

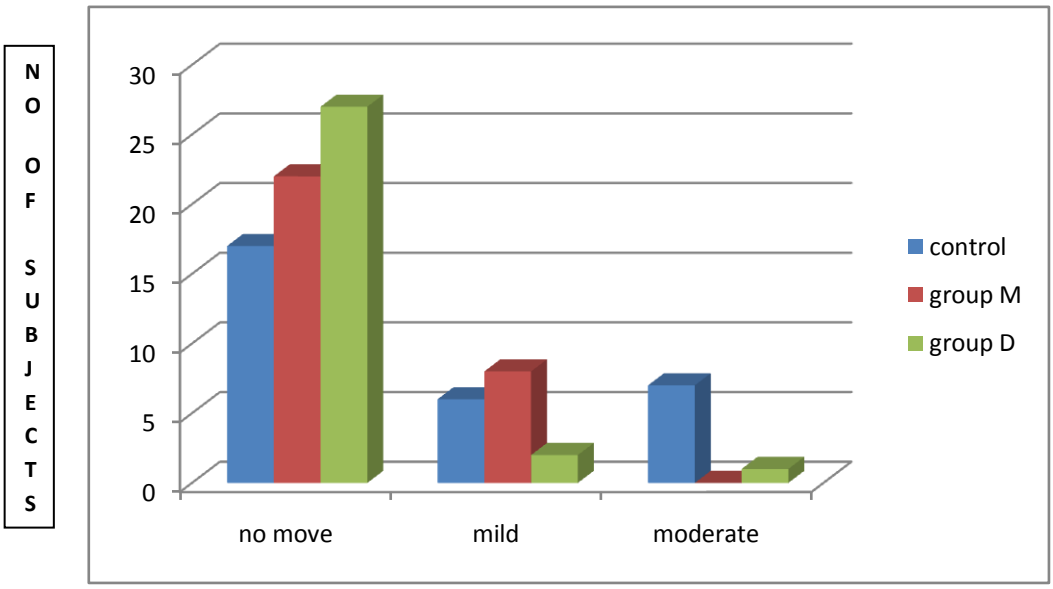
PATIENT MOVEMENT SCALE

	CONTROL		GROUP M	
P.M.S	n	%	n	%
1-No move	10	33.4%	22	73.3%
2-Mild	12	40.0%	7	23.3%
3-Moderate	8	26.6%	1	3.4%
Chi square value – 11.21				
Df- 2				
p-value – 0.003(significant)				

	GROUP M		GROUP D	
P.M.S	n	%	n	%
1-No move	22	73.3%	27	90.0%
2-Mild	7	23.3%	2	6.7%
3-Moderate	1	3.4%	1	3.3%
Chi square value – 3.48				
Df- 2				
p-value – 0.17(not significant)				

	CONTROL		GROUP D	
P.M.S	n	%	n	%
1-No move	10	33.4%	27	90.0%
2-Mild	6	40.0%	2	6.7%
3-Moderate	7	26.6%	1	3.3%
Chi square value – 20.3				
Df- 2				
p-value - <0.0003 (significant)				

SHOWING PATIENT MOVEMENT SCALE BETWEEN GROUPS



GROUPS SHOWING PATIENT MOVEMENT SCALE

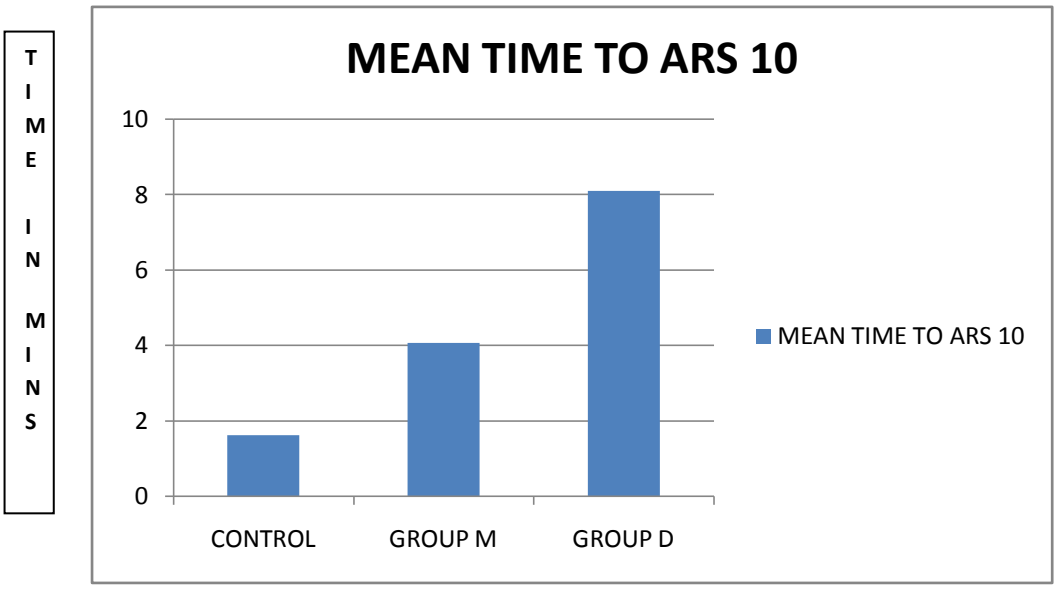
- ❖ The percentage of patients showing patient movement scale of 1(no move) in group M is 73.3%, group D is 90% and control is 33.4%
- ❖ The percentage of patients showing patient movement scale of 2 (mild move) in group M is 23.3%, group D is 6.7% and control is 40%
- ❖ The percentage of patients showing patient movement scale of 3(moderate move) in group M is 3.3%, group D is 3.4% and control is 26.6%

p- value

- between group M and group D is 0.17 which is statistically not significant
- between control and group M is 0.003 which is statistically significant
- between control and group D is <0.0003 which is statistically Significant

MEAN TIME TO ACHEIVE ALDRETE RECOVERY SCORE 10

TIME TO ALDRETE RECOVERY SCORE 10		Mean ± Standard Deviation	t-value	p-value
	CONTROL GROUP M	1.66±0.55 4.07±0.97	11.98	<0.0001(significant)
	GROUP M GROUP D	4.07±0.97 8.09±1.03	15.56	<0.0001(significant)
	GROUP D CONTROL	8.09±1.03 1.66±0.55	30.30	<0.0001(significant)



GROUPS SHOWING MEAN TIME TO REACH ARS 10

Mean time to achieve ARS of 10 in group M is 4.07 min and group D is 8.09 min and control group is 1.63 min . pvalues between the groups are < 0.0001 which is statistically significant.

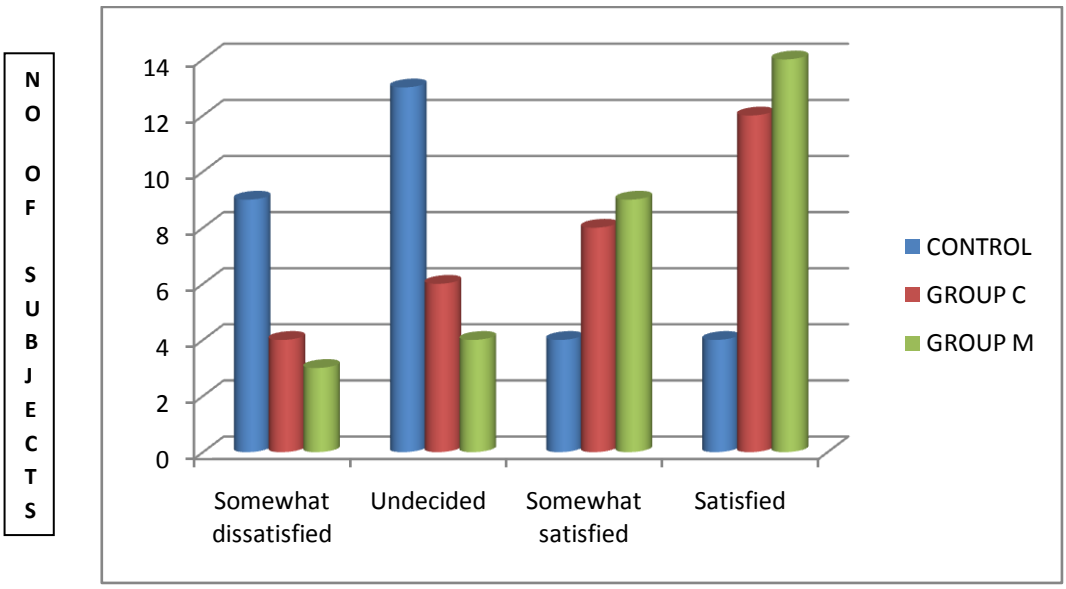
LIKERT LIKE VERBAL RATING SCALE BY SURGEON

	CONTROL		GROUP M(n=30)	
L.V.R.S	n	%	n	%
3-Somewhat dissatisfied	9	30.0%	4	13.3%
4-Undecided	13	43.4%	6	20.0%
5-Somewhat satisfied	4	13.3%	8	26.7%
6-Satisfied	4	13.3%	12	40.0%
Chi square value – 9.8354				
p-value – 0.020 (significant)				
Df-3				

	GROUP M (n=30)		GROUP D	
L.V.R.S	n	%	n	%
3-Somewhat dissatisfied	4	13.3%	3	10.0%
4-Undecided	6	20.0%	4	13.3%
5-Somewhat satisfied	8	26.7%	9	30.0%
6-Satisfied	12	40.0%	14	46.7%
Chi square value – 4.54				
p-value – 0.208 (not significant)				
Df-3				

	CONTROL		GROUP D	
L.V.R.S	n	%	n	%
3-Somewhat dissatisfied	9	30.30%	3	10.0%
4-Undecided	13	43.4%	4	13.3%
5-Somewhat satisfied	4	13.3%	9	30.0%
6-Satisfied	4	13.3%	14	46.7%
Chi square value – 15.24				
p-value – 0.0016 (significant)				
Df - 3				

LIKERT LIKE VERBAL RATING SCALE (LVRS) BY SURGEON



GROUPS SHOWING LIKERT VERBAL RATING SCALE

- ❖ The percentage of patients with LVRS OF 3(somewhat dissatisfied) in group M is13.3%, group D is 10.0% and control is 30.0%
- ❖ The percentage of patients with LVRS OF 4 (un decided) in group M is 20%, group D is 13.3% and control is 43.4%
- ❖ The percentage of patients with LVRS OF 5 (some what satisfied) in group M is 26.7%, group D is 40% and control is 13.3%
- ❖ The percentage of patients with LVRS OF 6 (satisfied) in group M is 40%, group D is 46.7% and control is 13.3%

p value

- between group M and group D is 0.20 which is statistically not significant
- between control and group M is 0.02 which is statistically significant
- between control and group D is 0.0016 which is statistically significant

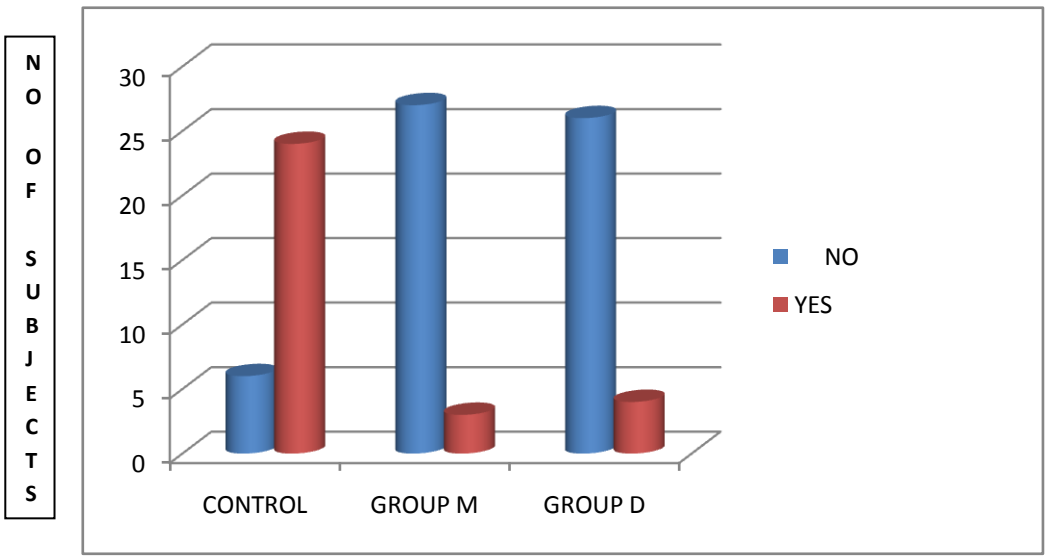
RECALL OF INTRA OP EVENTS

RECALL	CONTROL		GROUP M	
	n	%	n	%
NO	6	20%	27	50.9%
YES	24	80%	3	8.1%
Chi square value – 29.6				
Df- 1				
p-value - 0 (significant)				

RECALL	GROUP M		GROUP D	
	n	%	n	%
NO	27	50.9%	26	49.1%
YES	3	8.1%	4	10.8%
Chi square value – 0.161				
Df- 1				
p-value – 0.687 (not significant)				

RECALL	CONTROL		GROUP D	
	n	%	n	%
NO	6	20%	26	49.1%
YES	24	80%	4	10.8%
Chi square value – 26.78				
Df- 1				
p-value - 0 (significant)				

SHOWING RECALL OF INTRA OP EVENTS BETWEEN GROUPS



GROUPS SHOWING RECALL OF INTRA OP EVENTS

- ❖ 50.9% of patients in group M, 49.1% of patients in group D and 20% of patients in control group had no recall of intra op events
- ❖ 8.1%of patients in group M, 10.8% of patients in group D and 80% of patients in control group had recall of intra op events

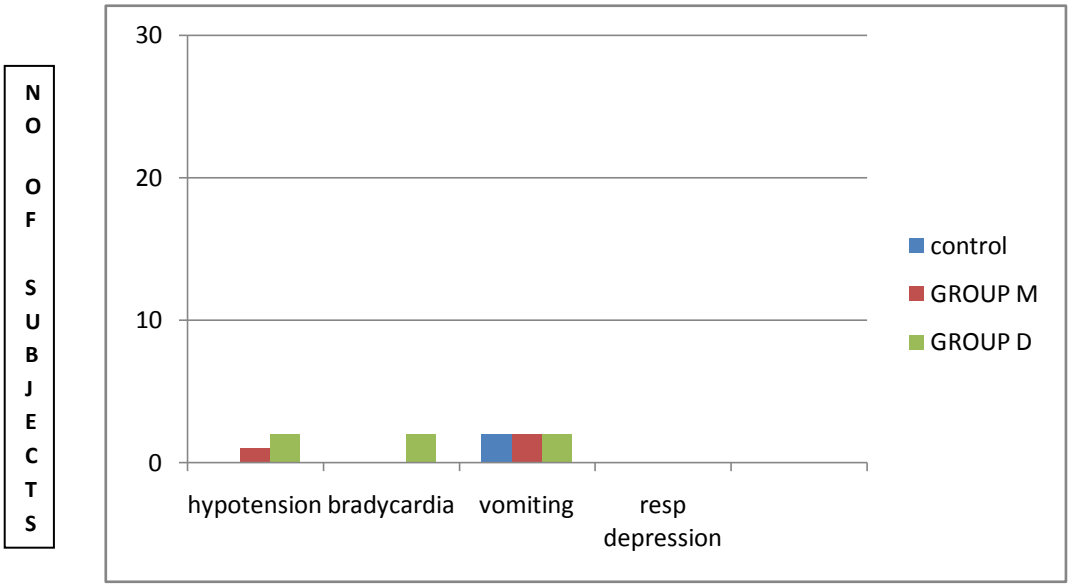
p- Value

- between group M and group D is 0.6 which is statistically not Significant
- between control and group M is 0 which is statistically Significant
- between control and group D is 0 which is statistically Significant

POST OP COMPLICATION

Column1	Column2	Column3	Column4		
	group m	group d	control		
hypotension	1 (3%)	2 (6.6%)	0		
bradycardia	0 (0%)	2 (6.6%)	0		
vomiting	2 (6.6%)	2(6.6%)	2 (6.6%)	X^2=3.6	
Resp depression	0	0	0	Df = 2	p-value =0.45(not significant)

POST OPERATIVE COMPLICATIONS BETWEEN THE GROUPS



GROUPS SHOWING POST OP COMPLICATIONS

There is no significant difference in the incidence of post op complications between the groups

DISCUSSION

1. In our study, mean age in Group M is 61.56, group D is 60.13 and control group is 60.83. All 3 groups are comparable in terms of age.
2. In our study, number of male patients in group M is 16, group D is 16 and control group is 14. The number of female patients in group M is 14, group D is 14 and control group is 16. All 3 groups are comparable in terms of sex.
3. The mean weight of patients in group M is 61.66, group D is 61.3 and control group is 61.28. All 3 groups are comparable in terms of weight.
4. Number of patients with ASA I in group M is 15, group D is 13 and control group is 12. The number of patients with ASA II in group M is 15, group D is 17 and control group is 18. All 3 groups are comparable in terms of ASA PS status.
5. There was no significant difference in the baseline systolic blood pressure and mean arterial pressure between the groups.
6. I n our study Mean systolic blood pressure and mean of M.A.P during intraoperative period was significantly different between group M and group D. [group M SBP (110.39 mmHg) and M.A.P (90.87 mmHg) VS group D SBP (99.96 mmHg) and

M.A.P (73.19 mmHg)]. These 2 groups differ significantly with that of control group. The results of our study were similar to the study conducted by **ROLO et al** where they administered midazolam in a loading dose of 0.05mg/kg for F.O.B and also to that of the study conducted by **WALEED M.A AL et al**[37] who administered inj. Dexmedetomidine in a loading dose of 1mg/kg for dental procedures. In both the studies maintenance dose was not given. This reduction in systolic blood pressure and M.A.P was due to reduction in systolic vascular resistance produced by the drugs. Midazolam have slightly better hemodynamic stability when compared to that of dexmedetomidine. There was no significant difference in the post operative blood pressure between the groups.

7. There was no significant difference in SPO_2 between the groups throughout the procedure . No patients in the group had a SP02 below 95% and supplemental O_2 was not given in any patient.
8. In our study mean heart rate significantly differs between group M and group D during loading dose administration and intraop period [Group M loading (72.63) , Intraop (72.23) VS group D (loading (68.2), intraop (64.7)]. Heart rate was slightly lower in group D when compared to midazolam group. Both groups differ significantly from that of the control group. In

the study conducted by **Richard . R . Riker et al** there was significant incidence of bradycardia in dexmedetomidine group when compared to that of midazolam group. In this study the patient received dexmedetomidine in the maintenance dose of 1mcg / kg /hr which was higher when compared to our study (0.3 mcg / kg / hr) and hence incidence of bradycardia was not significant in our study. In our study 6 out of 30 patients in group D had a heart rate less than 60/min during the intra op period but the M.A.P did not fall below 30% of baseline and hence treatment was not given. No patients in our study had a heart rate below 5 0/min

9. In our study mean time to reach RSS of 3 was shorter in dexmedetomidine group (6.33 mins) when compared to that of midazolam group (8.37 mins). In the study conducted by **priyanka sethi et al**[39] for ERCP procedures the meantime to reach RSS 3 was shorter for midazolam group when compared to Dexmedetomidine as the patients in the study received midazolam in a loading dose of 0.03 mg / kg as intravenous bolus which was supplemented by 0.5mg incremental doses .But in our study no supplemental dosing was given during loading dose. Hence this shows that the onset of effect of midazolam can

be made rapid by administrating additional incremental doses following loading dose.

10. In our study though there was no statistically significant difference between the group M and group D in Wong Baker facial pain scale. Most of the patients in group M (76.7 %) and group D (83.3 %) had FPS of 1 (mild hurt) during retrobulbar block administration which was significantly different from that of the control group in which 56.7 % of the patients had FPS of 3 (i.e moderate hurt) and 10 % of the patients had FPS of 4 (i.e severe hurt) . Similar results were observed in the studies conducted by **Danies FC Water M et al** who used midazolam in the dose of 0.5 mg i.v for minor trauma care procedures . As in our study with a loading dose of 0.05 mg/kg midazolam was found to be equally effective with that of dexmedetomidine in attaining the patient's cooperation for the placement of retro bulbar block which was not actually present in the studies which used lesser loading doses of midazolam.(such as Alhashemi et al who used loading dose of 0.01 to 0.02mg/kg of midazolam as loading dose
11. In our study there was no significant difference in the patient movement between group M and group D .But patient movement was significantly higher in control group. In a study conducted by

Alhashemi et al[26] patient movement was higher in midazolam group. But they administered only loading dose of midazolam and supplemented 0.5 mg of midazolam as and when required. In our study we used continuous infusion of midazolam and hence patient movement scale of group M was similar to that of dexmedetomidine group as the plane of sedation was relatively deeper in our study.

12. Mean time to achieve Aldrete Recovery Score of 10 in our study was 4.07 mins for group M and 8.09 mins for group D which is significant (p value < 0.0001). Mean time was prolonged in group D when compared to group M . Similar results were observed in a study conducted by **Alhasemi et al** who administered midazolam in a loading dose of 0.02 mg / kg followed by 0.5 mg supplementation as and when required as maintenance and administered Dexmedetomidine in a loading dose of 1mcg / kg over 10 mins followed by maintenance dose of 0.1- 0.7 mg / kg / hr.
13. Likert like verbal scale given by the surgeon showed no significant difference between the group M and group D (p value < 0.20) . But there was significant difference in surgeon satisfaction when the two groups were compared with that of control group in which 30.3% of patients showed " somewhat

dissatisfied " (LVRS – 3) scale and 43.3% showed " undecided " (LVRS – 4) scale whereas 40% of patients in group M and 46.7% of the patients in group D showed " satisfied " LVRS - 6 scale. In the study conducted by **Dhara . A . Vyas et al**[40] Surgeon's satisfaction scale was higher in group D than group M but in the study loading dose of Dexmedetomidine was given at a higher dose (1 mcg / kg) when compared to our study (0. 3mcg / kg). In the above study , Surgeons satisfaction scale was lower in midazolam group because of the unwanted patient movement during the procedure who received midazolam in a loading dose of 0.01 mg / kg which was lower when compared to our study (0.05 mg / kg) . Moreover we administered maintenance infusion of midazolam which was not given in the above study. Hence in our study by increasing the loading dose of midazolam it was possible to attain a comparatively deeper plane of sedation which was maintained throughout the procedure with the help of maintenance infusion.

14. In our study there was no significant difference in the recall of unpleasant intraoperative event between group D and group M . But in the study conducted by **Dhara . A . Vyas et al** , group D had lesser recall of events when compared to

group M . In this study the maintenance infusion of midazolam was lesser (0.01 mg / kg) when compared to our study (0.05 mg / kg) . Hence the plane of sedation was higher in our study during the procedure and the incidence of ‘recall of unpleasant intraop events' was lesser in our study

15. In our study there is no significant difference in the incidence of complications like vomiting, hypotension, respiratory depression and bradycardia between the groups

SUMMARY

We conducted a randomised control trial in 90 patients aged between 50 – 70 years and belonged to ASA I and II for cataract surgeries by retrobulbar block at K.A.P.V.Govt Medical College,Trichy.

An attempt was made

- To evaluate the advantage of conscious sedation in cataract surgeries which is done with retro bulbar block
- To compare the effects of midazolam and dexmedetomidine in conscious sedation

The patients were divided into three groups namely group M ,group D and control group.

We evaluated -

1) Anxiolysis of the patient
2) Patient's cooperation
    - in the placement of retro bulbar block and
    - during the procedure
3) hemodynamic stability
4) satisfaction of the surgeon
5) recovery profile of drugs
6) incidence of complications

We found that conscious sedation was safe and effective in the case of cataract surgery and was associated with greater patient ‘s comfort and surgeon’s satisfaction when compared to the surgeries which was done only with retro bulbar block alone.

Midazolam in a loading dose of 0.05mg/kg and in a maintenance dose of 0.03mg/kg was equally effective to dexmedetomidine in the aspect of patient’s co- operation during retro bulbar block and during surgery which was assessed by facial pain scale,patient movement scale and surgeon satisfaction scale and recall of intra op events.

Midazolam was slightly better to dexmedetomidine in the aspect of better hemodynamic profile.

However mean time to reach RSS of 3 was rapid with dexmedetomidine when compared to midazolam. But time to reach Aldrete recovery score 10 was prolonged in dexmedetomidine when compared to midazolam. Both the drugs had no significant complications in the peri operative period.

CONCLUSION

We conclude that conscious sedation is safe and effective to practise in the case of cataract surgeries and is associated with better patient's co operation and surgeon's comfort when compared to the surgeries which are done with retrobulbar block alone. Midazolam and dexmedetomidine are equally effective in the aspects of patient's co operation and surgeon's comfort but midazolam is slightly superior to dexmedetomidine in the aspect of better hemodynamic profile

BIBLIOGRAPHY

1. Eichel R, Goldberg I. Anaesthesia techniques for cataract surgery: a survey of delegates to the Congress of the International Council of Ophthalmology, 2002. Clin Experiment Ophthalmol 2005; 33: 469–72.
2. Janzen PR, Christys A, Vucevic M. Patient-controlled sedation using propofol in elderly patients in day-case cataract surgery. Br J Anaesth 1999; 82: 635–6.
3. Aydin ON, Kir E, Ozkan SB, Gursoy F. Patient-controlled analgesia and sedation with fentanyl in phacoemulsification under topical anesthesia. J Cataract Refract Surg 2002; 28: 1968–72.
4. Wong DH, Merrick PM. Intravenous sedation prior to peribulbar anaesthesia for cataract surgery in elderly patients. Can J Anaesth1996; 43: 1115–20.
5. Weinbroum AA, Szold O, Ogorek D, Flaishon R. Themidazolam-induced paradox phenomenon is reversible by flumazenil. Epidemiology, patient characteristics and review of the literature. Eur J Anaesthesiol 2001; 18: 789–97.
6. Salmon JF, Mets B, James MF, Murray AD. Intravenous sedation for ocular surgery under local anaesthesia. Br J Ophthalmol 1992;76: 598–601.

7. Hall JE, Uhrich TD, Barney JA, Arain SR, Ebert TJ. Sedative,amnesic, and analgesic properties of small-dose dexmedetomidine infusions. Anesth Analg 2000; 90: 699–705.
8. Aantaa R, Jaakola ML, Kallio A, Kanto J, Scheinin M, Vuorinen J. A comparison of dexmedetomidine, and midazolam as i.m premedication for gynaecological procedures . Br J Anaesth 1991; 67: 402–9.
9. Alhashemi JA, Kaki AM. Dexmedetomidine in combination with morphine PCA provides superior analgesia for shockwavelithotripsy. Can J Anaesth 2004; 51: 342–7.
10. Ramsay MA, Savege TM, Simpson BR, Goodwin R.Controlled sedation with alphaxalone-alphadolone. Br Med J1974; 2: 656–9.
11. Aldrete JA, Kroulik D. A postanesthetic recovery score. Anesth Analg 1970; 49: 924–34.
12. Streiner DL, Norman GR. Scaling responses. In: Streiner DL, Norman GR, eds. Health Measurement Scales: A Practical Guide to Their Development and Use. Oxford: Oxford University Press, 1995; 28–53.
13. Dupont W.D.,Plummer W.D ,J r power and sample size calculations. A rfeview and computer programcontrol clin trials 1990 11. 116 – 28.

14. Virkkila . M,Ali-Meikkila T Kanto J Turunen .J.ScheinioH .Dexmedetomidine as intramuscular premedication for day care cataract surgery . A Comparative study of dexmedetomidine ,midazolam and placebo . Anaesthesia 1994:49 853-8.
15. Scheinin H, Karhuvaara S, Olkkola KT, et al. Pharmacodynamics and pharmacokinetics of intramuscular dexmedetomidine. Clin Pharmacol Ther 1992; 52: 537–46.
16. Arain SR, Ebert TJ. The efficacy, side effects, and recovery characteristics of dexmedetomidine versus propofol when used for intraoperative sedation. Anesth Analg 2002; 95:461–6.
17. Inan UU, Sivaci RG, Ozturk F. Effectiveness of oxygenation and suction in cataract surgery: is suction of CO2-enriched air under the drape during cataract surgery necessary? Eye 2003;17: 74.
18. Fredman B, Lahav M, Zohar E, Golod M, Paruta I, Jedeikin R. The effect of midazolam premedication on mental and psychomotor recovery in geriatric patients undergoing brief surgical procedures. Anesth Analg 1999; 89: 1161–6–8.
19. Oei-Lim VL, Kalkman CJ, Bartelsman JF, Res JC, van Wezel HB. Cardiovascular responses, arterial oxygen saturation and plasma catecholamine concentration during upper gastrointestinal endoscopy using conscious sedation with midazolam or propofol. Eur J Anaesthesiol 1998; 15: 535–43.

20. Barton CW, Wang ES. Correlation of end tidal CO2 measurements to arterial PaCO2 in nonintubated patients. Ann EmergMed 1994; 23: 560–3.
21. Risdall JE, Geraghty IF. Oxygenation of patients undergoing ophthalmic surgery under local anaesthesia. Anaesthesia 1997; 52: 492–5.
22. Schlager A, Luger TJ. Oxygen application by a nasal probe prevents hypoxia but not rebreathing of carbon dioxide in patients undergoing eye surgery under local anaesthesia. Br J Ophthalmol 2000; 84: 399–402.
23. Stoelting pharmacology and physiology 2nd edition page no 142 – 147.
24. Ronald .D.MILLER 7 th edition page no – 751 -756
25. American Society of Anesthesiologists. Continuum of Depth of Sedation: Definition of General Anesthesia and Levels of Sedation/Analgesia, 2004.
26. Alhashemi JA. Dexmedetomidine vs. midazolam for monitored anaesthesia care during cataract surgery. Br J Anaesth 2006;96:722-6.
27. Dere K, Sucullu I, Budak ET, Yeyen S, Filiz AI, Ozkan S, *et al*. A comparison of dexmedetomidine versus midazolam for sedation,

pain and hemodynamic control, during colonoscopy under conscious sedation. Eur J Anaesthesiol 2010;27:648-52.

28. Maze M, Tranquilli W. Alpha-2 adrenoceptor agonists: Defining the role in clinical anesthesia. Anesthesiology 1991;74:581-605.
29. Kuhar MJ, Unnerstall JR. Mapping receptors for alpha 2-agonists in the central nervous system. J Cardiovasc Pharmacol 1984;6 Suppl 3:S536-42.
30. Abdellatif AA, Elkabarity RH, Hamdy TA. Dexmedetomedine vs. midazolam sedation in middle ear surgery under local anesthesia: Effect on surgical field and patient satisfaction. Egypt J Anaesth 2012;28:117-23.
31. Karaaslan K, Yilmaz F, Gulcu N, Colak C, Sereflican M, Kocoglu H. Comparison of dexmedetomidine and midazolam for monitored anesthesia care combined with tramadol vpatient-controlled analgesia in endoscopic nasal surgery: A prospective, randomized, double-blind, clinical study. Curr Ther Res Clin Exp 2007;68:69-81.
32. Kilic N, Sahin S, Aksu H, Yavascaoglu B, Gurbet A, Turker G, *et al*. Conscious sedation for endoscopic retrograde cholangiopancreatography: Dexmedetomidine versus midazolam. Eurasian J Med 2011;43:13-7.

33. Venn RM, Bradshaw CJ, Spencer R, Brealey D, Caudwell E, Naughton C, *et al*. Preliminary UK experience of dexmedetomidine, a novel agent for postoperative sedation in the intensive care unit. Anaesthesia 1999;54:1136-42.

34. Carollo DS, Nossaman BD, Ramadhyani U. Dexmedetomidine: A review of clinical applications. Curr Opin Anaesthesiol 2008;21:457-61.

35. Kilic N, Sahin S, Aksu H, Yavascaoglu B, Gurbet A, Turker G, *et al*. Conscious sedation for endoscopic retrograde cholangiopancreatography: Dexmedetomidine versus midazolam. Eurasian J Med 2011;43:13-7.

36. Sedation with midazolam in flexible bronchoscopy: a prospective study.[Article in English, Portuguese].

37. Rolo R[1], Mota PC, Coelho F, Alves D, Fernandes G, Cunha J, Hespanhol V, Magalhães A. 2012 Sep-Oct;18(5):226-32. doi: 10.1016/j.rppneu.2012.03.002.. Epub 2012 May 14.

38. WALEED M.A..A.l Taher Department of Anesthesia and Intensive Care, Ain Shams University, Egypt World Pumps 01/2010; 26(4):299-304. DOI: 10.1016/j.egja.2010.04.002. An outcome study comparing intravenous sedation with midazolam/fentanyl (conscious sedation) versus propofol infusion

(deep sedation) for aesthetic surgery. Hasen KV[1], Samartzis D, Casas LA, Mustoe TA.

39. INDIAN JOURNAL OF ANAESTHESIOLOGIST Dexmedetomidine versus midazolam for conscious sedation in endoscopic retrograde cholangiopan creatography: An open-label randomised controlled trial Priyanka Sethi[1], Sadik Mohammed[1], Pradeep Kumar Bhatia. Year :2014 | Volume :58 | Issue :1 | Page :18-24.

40. A comparative study of dexmedetomidine vs midazolam for sedation and hemodynamic changes during tympanoplasty and modified radical mastoidectomy *Dhara A. Vyas, Nikunj H. Hihoriya, Rina A. Gadhavi. INT* J Basic Clin Pharmacol. 2013; 2(5): 562-566

PROFORMA

NAME-

AGE- HT-

I.P.NO- WT-

ASA GRADE- SURGERY-

MALLAMPATTI CLASS

MONITORS- N.I.B.P/ PULSEOXYMETRY/E.C.G

BASELINE - B.P P.R SPO2

GROUP D/GROUP M

LOADING DOSE-

INTRA OCULAR PRESSURE-

RETROBULBAR BLOCK-

MAINTAINANCE DOSE-

INTRA OP VITALS

TIME	B.P	P.R	SPO2	R.S.S	F.P.S	P.M.S

TIME TO ALDRETE RECOVERY SCORE 10

POST OP PARAMETERS

TIME	B.P	P.R	SPO2	R.S.S	COMP

1) LIKERT LIKE VERBAL RATING SCALE-

2) ABILITY TO RECALL INTRA OP EVENTS

YES/NO

நோயாளி சம்மதக் கடிதம்

கண்களில் ஏற்படும் புரையினால் கண்பார்வை பாதிக்கப்படடலாம். இதற்கு அறுவைசிகிச்சை மேற்கொள்வது அவசியம்.

உங்களை ஈடுபடுத்த திட்டமிட்டுள்ள இந்த மருத்துவ ஆய்வில் அறுவை சிகிச்சையின் போது தேவையற்ற அசைவுகளை தடுக்கவும், அறுவை சிகிச்சையின் போது லேசான மயக்க நிலையில் இருக்கவும், Midazolam மற்றும் Dexmedetomidine எனும் மருந்துகள் செலுத்தப்படும். இதனால் அறுவை சிகிச்சை செய்யும் மருத்துவருக்கும் கண்புரையை நீக்குவது எளிதாக இருக்கும்.

அனைத்து மருத்துவ முறைகளிலும் இருப்பது போல் இம்மருத்துவ முறையிலும் எதிர்பாரா இடர்கள் நேரிடலாம்.

உங்கள் மருத்துவப் பதிவேடுகள் மிகவும் அந்தரங்கமாக வைத்துக் கொள்ளப்படும. இந்த ஆய்வின் முடிவுகள் அறிவியல் பத்திரிக்கைகளில் வெளியிடப்படலாம். ஆனால் உங்கள் இரகசியத்தன்மை பாதுகாக்கப்படும். இந்த ஆய்விலிருநது தாங்கள் எந்த நேரமும் காரணம் இல்லாமல் விலகிக் கொள்ளலாம். எப்படி இருந்தாலும், தேவையான சிகிச்சை அளிக்கப்படும்.

மேற்கூறிய மருத்துவத் தகவல்களை இந்த ஆய்வினை மேற்கொள்ளும் மருத்துவர் மூலம் அறிந்து நான் தன்னிச்சையாக இந்த ஆய்வில் பங்கேற்கிறேன்.

இந்த ஆய்வு சம்மந்தமாகவோ, இதை சார்ந்த மேலும் மேற்கொள்ளும் மற்ற ஆய்வுகளில் பங்கேற்கும் மருத்துவர் என் மருத்துவ அறிக்கைகளை பார்ப்பதற்கு என் அனுமதி தேவையில்லை என்பதை அறிவேன்.

எனது நலன் கருதியே இந்த ஆய்வு மேற்கொள்ளப்படுகிறது என தெரிந்து இந்த ஆய்விற்கு சம்மதிக்கிறேன்.

கையொப்பம்

அல்லது

இடது கட்டைவிரல் கைநாட்டை

KEY WORDS

M.A.P	-	Mean Arterial Pressure
P.R	-	Pulse Rate
S.B.P	-	Systolic Blood Pressure
R.S.S	-	Ramsay Sedation Score
F.P.S	-	Facial Pain Score (Wong Baker)
P.M.S	-	Patient Movement Scale
A.R.S	-	Aldrete Recovery Scale
L.V.R.S	-	Likert-Like Verbal Rating Scale
Hypo	-	Hypotension
Brady	-	Bradycardia
Vomit	-	Vomiting
Resp. Dep	-	Respiration Depression

NAME	AGE	SEX	ASA	GROUP	WT	B.P														
						baseline	loading dose			intra op						post op				
						0min	3 min	6 min	10 min	15 min	20 min	25 min	30 min	35 min	40 min	1 min	30 min	60 min	90 min	120 min
MANI	62	M	II	M	62	134/68	127/74	108/74	102/62	101/64	101/64	102/74	104/64	104/64	128/67	118/64	114/64	112/64	108/64	108/64
SRIDEVI	68	F	I	M	68	116/64	118/54	114/72	118/64	116/64	114/64	106/64	106/64	104/64	108/64	110/80	110/64	114/80	118/72	122/64
RAJAYYA	64	M	II	M	70	114/64	112/64	126/64	124/64	130/64	122/64	124/64	122/64	124/64	122/64	101/62	104/62	108/72	106/64	104/61
MUTHAYA	54	M	I	M	64	130/82	100/60	101/64	102/73	106/72	101/64	102/64	101/64	106/64	108/74	114/64	112/72	112/67	114/64	112/64
SATHI	57	F	I	M	68	114/62	100/64	98/64	99/62	98/70	99/72	99/74	100/68	100/62	100/70	114/62	104/61	110/58	120/74	124/70
MUKUNTHAN	57	M	I	M	54	122/74	112/74	114/64	114/62	112/68	114/64	112/72	112/67	114/64	112/64	114/64	114/64	112/64	118/76	116/74
VANATHI	56	F	II	M	56	120/78	106/70	108/72	104/64	106/66	104/64	104/66	106/64	106/74	108/74	124/64	110/62	108/70	104/70	102/60
VASANTHI	58	M	I	M	58	130/72	118/64	116/72	114/68	116/72	114/72	106/74	106/66	108/68	106/72	102/57	106/80	106/62	102/70	104/64
MEENA	57	F	I	M	58	124/64	112/72	116/64	118/70	118/70	112/62	114/64	114/64	112/64	102/70	108/76	106/72	108/70	104/70	102/68
VETIYAN	56	M	I	M	64	114/76	114/64	116/64	120/72	120/64	120/64	118/72	118/72	118/70	108/72	104/70	106/68	106/64	114/72	114/68
SUMATHY	68	F	II	M	62	118/72	118/76	118/72	114/70	114/70	114/64	116/64	118/74	108/74	106/64	108/66	110/64	104/64	102/66	108/64
PANDIYAN	64	M	II	M	68	126/76	116/64	116/72	114/72	118/64	114/64	116/72	114/62	116/78	117/64	114/64	116/72	120/64	120/64	120/70
KUYILI	66	F	I	M	64	117/64	104/70	108/64	104/64	106/72	112/64	114/64	112/72	112/64	114/64	114/76	110/74	122/72	120/70	122/72
RADHA	64	F	II	M	70	124/64	100/57	118/78	114/68	114/64	118/68	119/72	120/78	120/72	120/78	108/76	106/72	108/70	104/70	102/68
MUNI	64	M	II	M	58	130/80	114/72	108/80	104/76	102/66	104/68	104/72	106/70	106/72	104/64	104/64	104/62	102/68	102/64	108/64
KUNTHI	62	F	II	M	64	134/64	114/64	118/64	114/64	116/64	104/64	102/72	104/70	102/68	102/66	122/72	122/80	122/72	124/64	118/78
RAJENDER	61	M	II	M	52	126/74	104/64	104/70	106/64	106/66	104/62	106/74	106/72	104/66	104/64	128/70	108/68	110/72	110/72	112/72
KARUPI	64	F	II	M	60	128/74	118/64	114/64	116/64	114/62	112/64	114/64	114/64	112/64	118/76	112/76	114/70	104/68	106/70	106/72
SEEVAN	61	M	II	M	66	114/72	1024/64	106/64	112/64	116/64	114/64	114/64	112/64	112/64	118/74	114/64	116/72	114/62	116/78	117/64
LAXMI	64	F	II	M	64	118/74	102/64	118/72	118/64	128/72	124/74	124/78	118/64	116/72	104/72	112/64	114/64	112/72	112/64	114/64
MURUGAN	66	M	I	M	67	104/61	106/64	104/62	102/64	104/64	102/66	102/74	104/64	108/68	106/70	114/62	114/70	106/72	106/64	108/70
BEGUM	68	F	II	M	52	114/67	104/64	106/72	104/66	102/64	102/66	104/64	104/64	104/64	106/64	112/64	114/64	112/72	112/64	114/64
RAYAN	54	M	I	M	61	118/72	100/76	104/67	106/80	102/64	102/57	106/80	106/62	102/70	104/64	118/68	119/72	120/78	120/72	120/78
GANESAN	54	M	I	M	64	122/64	100/64	106/80	104/72	106/72	108/76	106/72	108/70	104/70	102/68	104/68	104/72	106/70	106/72	104/64
ANGELINE	62	F	II	M	56	126/76	106/64	102/64	108/64	102/64	104/64	104/62	102/68	102/64	108/64	118/60	108/72	112/64	102/68	102/64
GNANAVEL	64	M	I	M	64	116/74	120/76	128/74	124/64	124/64	122/72	122/80	122/72	124/64	118/78	104/64	104/66	106/64	106/74	108/74
MADURAM	58	F	I	M	68	114/64	101/64	106/64	106/64	106/70	109/64	109/67	100/64	104/60	102/64	114/72	106/74	106/66	108/68	106/72
ANBARASU	56	M	I	M	56	126/68	104/64	108/64	106/74	112/74	114/64	114/67	112/64	136/64	129/78	112/62	114/64	114/64	112/64	102/70
ADHARSAM	54	M	I	M	54	118/64	114/64	112/64	106/67	106/72	108/66	110/64	104/64	102/66	108/64	120/64	118/72	118/72	118/70	108/72
MALATHI	62	F	II	M	58	114/72	116/72	114/64	116/70	118/64	114/64	116/72	120/64	120/64	120/70	104/68	104/72	114/70	110/76	114/72

mean M.A.P				P.R															TIME TO	TIME TO	
baseline	loading	intraop	post op		loading dose			intra op						post op					RSS 2	RSS 3	baseline
				120 min	3min	6 min	10 min	15 min	20 min	25 min	30 min	35 min	40 min	1 min	30 min	60 min	90 min	120 min			0
82.5	84.4	82.4	92.4	74	87	76	72	68	67	64	64	62	64	74	76	72	67	70	5	10	99
86.5	81.1	78.4	90.1	78	74	72	71	74	71	71	70	70	72	76	74	78	68	72	5	7	100
90.1	81.3	84.5	92.4	76	76	74	68	69	67	70	72	72	69	88	74	76	71	72	6	10	99
96.5	84.6	86.4	94.4	72	67	67	63	68	65	66	64	66	68	82	82	72	70	76	6	8	99
94.2	86.4	84.5	94.6	84	82	86	97	84	81	74	76	76	68	84	84	72	71	74	8	8	99
90.6	82.1	82.4	90.4	86	76	72	71	69	68	64	66	72	71	86	86	82	84	82	5	7	99
84.7	84.1	80.4	92.4	90	74	72	71	76	72	74	72	77	84	84	72	74	78	80	5	8	99
88.6	80.4	84.6	91.6	84	74	67	68	68	69	65	64	67	66	86	86	84	70	84	6	9	100
84.6	90.1	84.4	94.4	86	74	75	74	72	71	62	67	64	67	84	82	76	72	72	7	9	100
82	84.6	84.3	87.6	88	84	74	76	97	87	84	88	86	89	84	80	74	71	86	7	7	99
84.6	90.3	80.4	90.4	94	74	102	74	76	72	71	72	71	70	82	80	88	68	74	8	9	99
95.4	88.4	82.1	92.4	90	72	74	66	72	74	78	76	76	74	86	80	80	78	82	5	7	99
94.3	86.4	80.6	96.4	84	68	74	69	62	64	66	66	62	64	80	74	72	70	84	6	8	100
94.1	84.1	81.4	94.4	78	68	67	72	67	77	72	80	84	82	88	76	84	72	78	6	9	99
90.4	90.1	84.4	92.2	76	74	72	74	78	77	74	74	76	76	72	80	86	76	72	5	10	99
90.4	82.4	80.1	92.4	72	72	68	67	68	67	76	72	74	84	90	74	64	64	72	6	9	100
84.6	90.4	84.5	90.4	80	64	67	64	67	64	64	66	68	62	88	82	78	72	76	7	8	100
88.7	88.8	82.4	88.7	78	72	79	74	74	71	70	70	70	70	96	76	82	78	86	7	9	99
90.4	84.6	82.4	86.4	76	64	64	64	67	68	64	67	66	66	94	72	76	76	74	8	9	99
92.4	80.4	80.4	94.4	70	64	72	68	74	74	70	76	72	74	94	74	74	82	72	5	9	99
94.6	80.4	80.1	88.2	84	66	66	62	60	68	64	66	64	66	86	84	86	80	84	4	9	99
94.8	84.6	82.1	90.8	86	78	76	70	72	72	73	74	74	75	88	84	74	76	80	5	7	100
90.4	84.6	82.4	86.4	84	74	76	64	70	74	74	75	75	74	87	84	88	76	82	4	8	99
90.4	82.1	82.1	92.1	90	69	69	68	65	65	67	76	74	74	84	86	80	82	82	6	8	99
86.7	80.1	79.1	87.4	84	69	68	68	67	67	72	76	76	77	76	84	84	70	86	6	9	99
94.4	80.3	74.1	90.4	76	82	84	86	82	86	86	84	87	86	86	90	86	72	84	5	9	100
88.7	80.4	80.2	85.2	78	80	86	80	80	87	82	82	80	81	82	72	84	74	81	4	9	99
86.4	82.1	80.4	85.6	78	74	76	70	74	72	76	74	78	80	88	76	80	72	76	5	8	99
84.6	80.3	80.4	90.2	72	68	69	70	70	70	72	72	78	74	88	76	89	72	74	5	9	99
82.4	78.4	78.6	91.4	70	72	70	70	70	69	68	70	71	68	96	78	76	72	74	5	9	100

SPO2														F.P.S	P.M.S	A.R.S	L.V.R.S	RECALL	POST OP COMPLICATION			
loading dose			intra op						postop										hypo	brady	vomit	resp dep
3 min	6 min	10 min	15 min	20 min	25 min	30 min	35 min	40 min	1 min	30min	60 min	90min	120 min									
99	99	99	99	99	99	99	99	99	99	99	99	99	99	2	1	3	3	NO	no	no	no	no
100	100	100	100	100	100	100	100	100	100	100	100	100	100	2	1	4	4	NO	no	no	no	no
99	99	99	99	99	99	99	99	99	99	99	99	99	99	2	2	5	4	NO	no	no	no	no
99	99	99	99	99	99	99	99	99	99	99	99	99	99	2	1	5	4	NO	no	no	no	no
99	99	99	99	99	99	99	99	99	99	99	99	99	99	2	1	4	5	NO	yes	no	no	no
99	99	99	99	99	99	99	99	99	99	99	99	99	99	2	2	4	4	NO	no	no	no	no
99	99	99	99	99	99	99	99	99	99	99	99	99	99	2	1	3	5	NO	no	no	no	no
100	100	100	100	100	100	100	100	100	100	100	100	100	100	2	2	6	6	NO	no	no	no	no
100	100	100	100	100	100	100	100	100	100	100	100	100	100	2	1	5	6	NO	no	no	yes	no
99	99	99	99	99	99	99	99	99	99	99	99	99	99	2	2	5	3	YES	no	no	no	no
99	99	99	99	99	99	99	99	99	99	99	99	99	99	4	2	6	4	NO	no	no	no	no
99	99	99	99	99	99	99	99	99	99	99	99	99	99	2	1	4	3	YES	no	no	no	no
100	100	100	100	100	100	100	100	100	100	100	100	100	100	4	3	4	4	NO	no	no	no	no
99	99	99	99	99	99	99	99	99	99	99	99	99	99	2	1	6	4	NO	no	no	no	no
99	99	99	99	99	99	99	99	99	99	99	99	99	99	4	2	3	6	YES	no	no	no	no
100	100	100	100	100	100	100	100	100	100	100	100	100	100	2	1	4	6	NO	no	no	yes	no
100	100	100	100	100	100	100	100	100	100	100	100	100	100	6	2	6	5	NO	no	no	no	no
99	99	99	99	99	99	99	99	99	99	99	99	99	99	2	1	5	5	NO	no	no	no	no
99	99	99	99	99	99	99	99	99	99	99	99	99	99	2	1	5	3	NO	no	no	no	no
99	99	99	99	99	99	99	99	99	99	99	99	99	99	2	1	4	5	NO	no	no	no	no
99	99	99	99	99	99	99	99	99	99	99	99	99	99	4	1	4	6	NO	no	no	no	no
100	100	100	100	100	100	100	100	100	100	100	100	100	100	4	1	5	4	NO	no	no	no	no
99	99	99	99	99	99	99	99	99	99	99	99	99	99	2	1	5	4	NO	no	no	no	no
99	99	99	99	99	99	99	99	99	99	99	99	99	99	2	1	4	4	NO	no	no	no	no
99	99	99	99	99	99	99	99	99	99	99	99	99	99	6	1	6	4	NO	no	no	no	no
100	100	100	100	100	100	100	100	100	100	100	100	100	100	2	1	5	4	NO	no	no	no	no
99	99	99	99	99	99	99	99	99	99	99	99	99	99	2	1	6	5	NO	no	no	no	no
99	99	99	99	99	99	99	99	99	99	99	99	99	99	2	1	5	4	NO	no	no	no	no
99	99	99	99	99	99	99	99	99	99	99	99	99	99	2	1	6	4	NO	no	no	no	no
100	100	100	100	100	100	100	100	100	100	100	100	100	100	2	1	6	5	NO	no	no	no	no

NAME	AGE	SEX	ASA	GROUP	WT	B.P															
						baseline	loading dose			intra op						post op					baseline
						0min	3 min	6 min	10 min	15 min	20 min	25 min	30 min	35 min	40 min	1 min	30 min	60 min	90 min	120 min	
rajam	60	F	II	D	55	130/70	127/74	118/74	112/64	98/74	102/74	104/60	101/65	100/68	100/62	108/70	106/76	104/72	106/75	110/76	84.5
krishnamani	66	M	II	D	64	127/88	118/54	114/72	104/68	99/71	99/68	98/64	98/64	98/72	98/72	110/80	110/64	112/62	118/72	120/74	88.4
MUTHUSAMI	58	M	I	D	68	114/62	112/64	108/64	104/61	102/64	101/64	100/61	98/74	98/72	99/60	101/62	104/62	108/72	106/64	104/61	90.1
NATESAN	64	M	II	D	70	130/82	114/72	112/74	112/64	108/71	106/64	101/64	100/54	100/54	100/61	104/65	106/54	110/68	112/74	112/64	94.2
BHUVANA	56	F	I	D	54	114/62	140/92	134/74	130/64	121/64	118/70	120/64	118/64	116/58	110/78	114/62	104/61	110/58	112/72	114/64	96.4
MUKUNTHAN	64	M	II	D	55	124/76	118/76	98/64	94/64	96/61	92/60	94/67	96/64	94/61	97/54	118/62	116/54	108/61	108/64	108/70	92.4
VEERAN	66	F	II	D	60	120/78	136/74	138/80	138/80	130/74	138/64	136/84	136/72	136/72	138/72	124/64	110/62	108/70	108/64	110/74	86.7
VASAN	64	M	II	D	64	130/72	118/74	101/64	98/58	96/56	94/56	96/60	96/60	92/64	94/62	128/78	120/76	118/64	114/72	110/68	88.6
MARAN	57	M	I	D	66	118/76	102/74	94/54	92/60	92/58	90/64	92/64	94/58	99/68	94/64	104/68	117/64	118/64	118/64	120/74	84.6
MARIYAMMAL	57	F	I	D	68	114/76	104/66	96/64	94/64	94/58	94/60	96/64	96/66	99/70	97/62	104/70	106/68	106/64	114/72	114/68	84.4
SUJATHA	58	F	I	D	70	116/76	102/64	98/64	96/64	94/54	92/66	94/64	94/64	98/64	98/64	108/76	106/68	110/72	114/76	114/72	86.4
RAJAN	54	M	I	D	56	124/72	101/58	96/64	94/56	94/60	94/66	96/58	96/61	100/61	102/66	106/72	108/76	110/82	114/80	116/78	92.4
SUBBU	62	M	II	D	54	117/64	100/54	99/64	94/54	96/60	98/64	98/54	96/54	98/60	99/64	114/76	124/68	122/72	120/70	122/72	94.3
KASI	70	M	II	D	58	112/74	100/57	98/64	96/60	96/58	100/64	100/64	101/64	102/64	104/64	118/72	116/70	120/74	120/72	124/78	94.1
KALA	64	F	II	D	54	130/80	114/72	98/61	96/52	96/58	101/64	104/64	104/64	102/64	104/70	108/68	108/72	110/70	108/70	110/72	88.6
MALA	66	F	II	D	52	132/87	116/64	94/64	92/64	92/60	94/60	92/64	92/58	96/72	99/74	102/68	104/68	106/72	106/68	104/62	92.4
PORIYAN	67	M	II	D	50	126/74	112/64	96/64	96/56	94/60	94/64	96/60	96/58	98/67	97/64	106/76	108/68	110/72	110/72	112/72	84.6
MASAMMA	58	F	I	D	64	122/64	100/64	96/64	98/74	96/68	94/62	94/56	92/64	98/76	99/72	102/64	104/70	104/68	106/70	106/72	88.7
SUNDARI	52	F	I	D	61	114/72	102/64	96/74	96/64	94/58	100/64	98/97	96/64	100/64	99/62	110/62	110/72	110/68	112/70	114/68	90.4
ANNAM	61	F	II	D	69	108/64	140/88	136/80	136/78	128/72	124/74	124/78	118/64	116/72	114/68	118/72	120/64	120/72	122/70	122/72	92.4
RAMAN	63	M	II	D	66	104/61	106/64	94/64	96/58	94/60	96/64	94/62	95/66	97/64	98/70	102/64	104/70	106/72	106/64	108/70	94.5
RAMASAMY	67	M	II	D	64	104/66	104/64	96/61	96/64	98/66	100/75	100/68	104/64	104/64	106/64	108/68	106/68	108/64	106/72	108/68	94.8
NATESAN	58	M	II	D	63	104/62	100/76	92/64	90/60	90/64	94/64	96/54	98/62	96/64	96/62	96/58	110/74	112/64	112/72	112/80	93.1
SAMIRAJ	59	M	II	D	64	102/76	100/64	92/64	94/70	92/66	96/64	97/64	98/60	96/64	96/58	108/64	106/70	108/68	108/66	110/70	91.2
MUTHU	54	M	I	D	59	116/72	100/58	94/56	96/64	94/60	96/64	94/66	94/60	96/64	96/64	108/68	110/72	112/64	112/70	112/64	86.7
RAMAYEE	57	F	I	D	55	106/74	100/62	96/54	92/66	94/62	98/64	100/64	104/64	102/64	106/64	106/78	108/70	110/68	114/66	116/72	86.7
SIVAGAMI	54	F	I	D	54	103/74	101/64	96/60	94/64	96/70	99/64	99/64	96/64	96/72	98/68	108/68	106/66	104/70	106/72	116/78	88.7
SIVASU	56	F	I	D	64	106/76	112/64	94/58	94/58	94/64	96/72	98/64	98/64	94/66	97/64	96/54	106/74	120/74	120/74	122/68	84.4
SUNDARAM	52	M	I	D	70	116/78	108/66	104/64	100/56	98/64	96/62	96/60	94/62	92/64	94/62	106/64	106/71	112/70	114/71	110/71	84.6
CHINNAYI	60	F	II	D	68	106/72	106/72	104/56	98/70	96/58	96/60	96/60	96/58	98/62	100/70	100/72	104/72	104/64	110/76	110/78	82.4

mean M.A.P			P.R															TIME TO	TIME TO		
loading	intraop	post op	baseline	loading dose			intra op						post op					RSS 2	RSS 3	baseline	l
			0	3min	6 min	10 min	15 min	20 min	25 min	30 min	35 min	40 min	1 min	30 min	60 min	90 min	120 min			0	3 min
74.1	71.2	88.4	78	75	71	70	68	62	59	59	61	60	67	72	74	76	76	2	7	99	99
71.1	72.4	91.4	78	81	74	76	64	65	61	64	62	67	68	66	72	74	78	3	5	100	99
72.1	73.1	92.4	81	84	64	66	62	59	59	58	61	64	71	74	72	74	76	3	5	99	99
74.1	71.1	94.4	87	64	61	61	58	57	56	56	56	56	58	71	75	82	80	4	5	100	99
74.1	71.4	94.2	87	112	96	87	84	81	74	76	76	68	71	72	74	84	84	5	6	99	99
72.1	70.4	90.4	82	80	69	94	92	58	58	57	64	70	84	82	82	86	81	3	7	99	99
74.4	71.4	92.4	84	114	112	101	106	104	98	97	87	84	78	64	68	72	76	4	7	100	100
74.6	72.1	92.2	88	76	69	66	64	64	62	59	59	61	70	84	84	86	86	4	8	99	99
73.4	72	94.4	86	82	66	64	58	58	58	64	64	66	72	76	72	82	84	4	5	99	99
73.4	72.4	87.6	84	84	64	64	61	61	60	60	68	70	71	74	76	80	78	5	8	100	99
72.1	72.1	90.4	78	64	72	70	64	62	62	62	64	70	68	72	74	80	76	3	6	99	99
72.4	72.4	92.4	76	72	74	66	58	60	58	56	66	74	78	80	82	80	84	3	6	99	99
71.1	72.1	94.4	74	68	64	59	58	58	56	56	62	64	70	72	72	74	76	6	6	99	98
74.1	70.4	94.4	76	69	68	62	62	60	58	59	59	58	57	72	78	76	74	5	7	99	100
72.1	71.1	92.2	79	74	66	64	62	62	60	62	72	74	76	76	72	80	82	4	7	100	99
74.4	72.1	92.4	75	72	68	64	62	62	63	62	61	59	64	64	72	74	78	4	6	99	100
72.4	72.4	90.4	74	68	64	61	62	61	64	66	68	68	72	78	76	82	82	3	7	99	99
78.4	71.6	94.4	74	72	68	64	64	59	59	60	61	64	78	72	76	76	80	5	6	99	100
70.4	71.4	94.1	66	68	66	64	62	58	58	58	64	72	76	76	74	72	74	5	7	100	100
71.6	72.4	92.4	75	104	112	108	98	98	100	96	92	88	82	74	72	74	68	3	6	99	99
72.1	72.23	93.1	88	78	76	74	70	69	69	69	68	72	80	76	86	84	88	5	7	99	100
72.6	70.4	92.1	87	78	76	74	72	72	64	66	62	64	76	74	80	84	89	6	5	99	99
70.4	71.6	94.4	86	79	76	64	61	61	62	62	70	68	76	86	84	84	86	3	6	100	98
74.1	71.6	92.4	86	88	86	78	70	71	70	68	69	72	82	80	88	86	90	4	6	99	100
76.1	72.3	84.7	84	89	88	80	76	72	72	59	58	64	70	76	76	84	88	4	6	100	100
74.4	72.4	84.6	82	92	84	76	72	70	72	70	60	64	72	88	92	90	88	3	7	99	99
74.6	74.1	85.2	80	90	86	76	74	68	66	66	64	64	74	76	74	68	72	4	7	99	99
76.4	72.4	86.4	87	90	88	72	72	64	62	62	59	62	72	70	72	76	78	5	7	99	99
72.4	71	90.2	88	82	80	75	72	66	64	61	60	64	72	74	76	78	80	5	6	99	99
70.4	72.1	91.4	82	84	74	67	60	56	56	58	59	60	72	74	76	74	76	4	6	99	98

SPO2													F.P.S	P.M.S	time to	L.V.R.S	RECALL	POST OP COMPLICATION			
oading dose		intra op						postop							ARS 10			hypo	brady	vomit	resp dep
6 min	10 min	15 min	20 min	25 min	30 min	35 min	40 min	1 min	30min	60 min	90min	120 min									
98	99	99	99	99	99	99	99	99	99	99	99	99	4	1	8	6	NO	no	no	no	no
99	99	99	99	99	99	99	99	99	99	99	99	99	2	1	6	6	NO	no	no	no	no
99	98	98	98	98	98	98	99	100	100	100	100	100	2	1	8	6	NO	no	no	no	no
99	99	100	100	100	100	100	100	100	99	99	99	99	2	1	9	5	NO	no	YES	no	no
99	99	99	100	100	100	100	99	100	100	100	100	100	4	1	9	6	NO	no	no	no	no
99	99	99	99	99	99	99	99	100	100	100	100	100	2	1	8	5	NO	no	no	no	no
100	99	98	98	100	100	100	100	100	100	100	100	100	2	1	10	4	NO	no	no	no	no
98	99	100	100	100	100	100	100	99	99	99	99	100	2	2	9	6	YES	no	no	no	no
98	100	99	99	98	100	100	99	100	100	100	100	100	2	1	8	4	NO	no	no	no	no
99	99	100	98	98	100	98	99	99	99	99	99	99	2	1	9	3	NO	no	no	YES	no
98	98	100	100	100	100	99	98	99	99	99	99	99	2	1	9	6	YES	no	no	no	no
98	99	100	100	100	98	99	98	99	99	99	99	99	2	1	8	5	YES	no	no	no	no
98	100	98	98	99	99	99	98	99	99	99	99	99	4	1	7	6	NO	no	no	no	no
100	99	99	99	99	99	99	99	100	100	100	100	100	2	1	9	5	NO	no	YES	no	no
99	99	99	99	98	98	98	99	99	99	99	99	99	2	1	8	6	NO	no	no	no	no
100	100	100	99	100	100	98	99	99	99	99	99	99	4	1	8	5	NO	no	no	no	no
100	99	99	99	99	99	99	100	100	100	100	100	100	2	1	9	6	NO	no	no	no	no
100	98	100	99	99	99	99	99	99	99	99	99	99	2	2	8	3	NO	no	no	no	no
100	99	99	99	99	99	99	99	100	100	100	100	100	2	1	6	5	NO	no	no	no	no
99	99	99	99	99	99	99	99	99	99	99	99	99	2	1	9	5	NO	no	no	no	no
100	99	100	99	100	100	98	99	99	99	99	99	99	2	1	9	6	YES	no	no	no	no
99	98	100	99	100	100	98	99	100	100	100	100	100	6	1	6	6	NO	no	no	YES	no
99	99	100	100	99	99	100	100	99	100	100	100	100	2	1	8	4	NO	YES	no	no	no
100	100	99	99	99	99	99	98	99	100	100	100	100	2	1	6	5	NO	no	no	no	no
100	100	99	99	99	99	99	99	99	99	99	99	99	2	1	7	6	NO	no	no	no	no
99	99	99	99	99	99	99	99	99	99	99	99	99	2	1	8	6	NO	no	no	no	no
99	99	99	99	99	99	99	99	99	99	99	99	99	2	1	9	3	NO	no	no	no	no
99	99	100	100	100	100	100	100	100	100	100	100	100	2	1	7	4	NO	YES	no	no	no
99	99	99	99	99	99	99	99	99	99	99	99	99	2	3	9	6	NO	no	no	no	no
99	100	98	99	100	98	98	99	99	99	99	99	99	2	1	7	5	NO	no	no	no	no

NAME	AGE	SEX	ASA	GROUP	WT	B.P															
						baseline	loading dose			intra op						post op					baseline
						0min	3 min	6 min	10 min	15 min	20 min	25 min	30 min	35 min	40 min	1 min	30 min	60 min	90 min	120 min	
MARY	62	F	II	C	62	130/70	127/74	118/74	112/64	138/74	132/74	134/60	131/60	127/64	128/67	108/70	116/76	104/72	106/75	110/76	88.4
MANI	58	M	I	C	66	127/88	118/54	114/72	118/64	122/67	118/64	128/64	122/64	122/64	126/64	110/80	110/64	114/80	118/72	122/64	86.4
MUNIYAYI	64	F	II	C	70	114/62	112/64	126/64	130/74	130/64	132/64	128/64	132/64	138/64	133/64	101/62	104/62	108/72	106/64	104/61	90.1
NATESAN	66	M	II	C	68	130/82	114/72	112/74	112/64	108/71	106/64	101/64	100/54	100/54	100/61	104/62	106/54	112/64	112/74	112/64	94.2
SANTHI	54	F	I	C	56	114/62	140/92	134/74	130/64	121/64	118/70	120/64	118/64	116/58	110/78	114/62	104/61	110/58	120/74	124/70	92.4
MUKUNTHAN	66	M	II	C	54	124/76	118/76	128/64	124/76	126/71	122/64	134/72	136/72	134/61	136/78	118/62	116/54	108/61	108/64	108/70	91.4
VASUKI	68	F	II	C	64	120/78	136/74	138/80	138/80	130/74	138/64	136/84	136/72	136/72	138/72	124/64	110/62	108/70	104/70	102/60	92.1
VASAN	64	M	II	C	66	130/72	121/74	121/72	128/67	136/74	134/74	126/72	126/66	128/72	136/72	128/78	120/76	118/64	114/72	110/68	94.4
MEENA	58	F	I	C	64	118/76	120/76	124/66	122/60	122/64	122/64	122/64	124/64	122/64	122/70	106/80	107/64	118/64	118/64	120/74	84.6
MINNAL	58	F	I	C	66	114/76	114/64	116/64	120/72	120/64	120/64	118/72	118/72	118/70	108/72	104/70	106/68	106/64	114/72	114/68	84.4
SUMITRA	62	F	II	C	68	116/76	118/76	118/72	114/70	114/70	114/64	116/64	118/74	108/74	106/64	108/76	106/68	108/62	104/77	114/72	86.4
PANDIYAN	64	M	II	C	58	124/72	120/72	126/80	124/88	128/60	124/60	126/72	126/64	120/70	120/74	106/72	108/76	110/82	114/80	116/78	92.4
SEETHA	52	F	I	C	52	117/64	124/70	128/67	124/72	126/78	124/72	124/64	122/72	122/68	128/72	114/76	110/74	122/72	120/70	122/72	94.3
RAVI	68	M	II	C	56	112/74	100/57	118/78	114/68	118/78	118/68	119/72	120/78	120/72	120/78	118/72	116/70	120/74	120/72	124/78	94.1
KAMALAM	64	F	II	C	64	130/80	114/72	118/76	124/72	132/74	134/74	136/74	136/74	138/74	124/74	108/68	108/72	110/70	108/70	110/72	88.6
DURGA	66	F	II	C	58	132/87	124/64	122/64	122/72	120/74	128/74	128/80	124/64	128/72	128/78	102/68	110/64	116/72	116/68	114/62	92.4
RAJAN	68	M	II	C	60	126/74	132/64	136/76	137/68	137/68	134/62	136/72	134/74	134/80	128/69	128/70	108/68	110/72	110/72	112/72	84.6
KALIYAYI	60	F	II	C	54	122/64	120/64	120/64	120/76	122/72	120/74	120/76	120/74	120/68	118/76	112/76	114/70	104/68	106/70	106/72	88.7
MUPIDATI	62	F	I	C	61	114/72	102/64	96/74	126/74	126/66	124/64	120/78	120/74	120/76	118/74	110/62	110/72	110/68	102/70	104/68	84.5
SORNAM	64	F	II	C	69	108/64	130/87	118/72	118/64	128/72	124/74	124/78	118/64	116/72	104/72	122/72	120/64	120/72	122/70	122/72	92.4
RAMAN	56	M	I	C	66	104/61	106/64	104/62	102/64	104/64	102/66	102/74	104/64	108/68	106/70	114/62	114/70	106/72	106/64	108/70	88.7
NEHRU	68	M	II	C	64	104/66	104/64	106/72	104/66	102/64	102/66	104/64	104/64	104/64	106/64	108/68	106/68	108/64	102/72	104/68	94.8
VASANTHI	58	F	I	C	64	104/62	100/76	104/67	106/80	102/64	102/57	106/80	106/62	102/70	104/64	102/64	110/74	112/64	102/72	102/80	93.1
KARUPAIYA	67	M	II	C	63	102/76	100/64	106/80	104/72	106/72	108/76	106/72	108/70	104/70	102/68	118/94	116/70	108/68	108/66	110/70	86.4
MARISAN	64	M	II	C	69	116/72	128/76	136/78	136/87	134/85	135/76	134/74	134/72	136/80	128/74	118/60	108/72	112/64	102/68	102/64	86.7
VIJAYA	54	F	I	C	55	106/74	120/76	128/74	124/64	124/64	122/72	122/80	122/72	124/64	118/78	116/72	118/70	110/68	114/66	116/72	91.4
SELVAM	58	M	I	C	54	103/74	101/64	106/64	106/64	106/70	109/64	109/67	100/64	104/60	102/64	104/72	106/66	102/64	108/68	118/67	88.7
ANBURAJ	56	M	I	C	54	106/76	112/64	127/64	128/64	128/72	138/74	136/84	136/72	136/64	129/78	118/74	116/72	120/74	120/74	122/68	90.2
AROKIYAM	54	M	I	C	54	116/78	124/80	126/72	124/76	126/72	126/72	124/64	124/64	122/74	124/72	104/72	104/68	112/70	114/71	112/64	86.4
KANCHANA	64	F	II	C	58	106/72	136/76	134/76	130/72	130/78	134/88	136/78	132/74	124/64	118/72	104/68	104/72	114/70	110/76	114/72	84.4

mean M.A.P			P.R															TIME TO	TIME TO		
loading	intraop	post op	baseline	loading dose			intra op						post op					RSS 2	RSS 3	baseline	
			0	3min	6 min	10 min	15 min	20 min	25 min	30 min	35 min	40 min	1 min	30 min	60 min	90 min	120 min			0	3 min
90.4	91.2	86.4	98	96	98	94	98	96	96	94	94	94	78	72	70	74	74	-	-	99	99
90.2	94	90.2	98	91	96	95	74	96	95	94	98	98	86	78	72	74	78	-	-	100	100
90.1	92.4	92.4	94	99	98	82	84	109	104	110	102	104	91	76	72	74	76	-	-	99	99
89.4	90.8	94.4	87	74	96	92	92	98	87	87	88	84	70	72	76	72	82	-	-	99	99
88.7	89.6	94.2	88	82	86	97	84	81	74	76	76	68	71	72	74	84	84	-	-	99	99
86.4	90.34	88.4	96	100	106	94	92	108	110	106	104	106	84	82	82	76	86	-	-	99	99
92.4	88.4	92.4	84	104	102	101	106	104	98	97	87	84	78	74	80	72	90	-	-	100	100
88.4	88.6	92.2	88	97	89	96	84	85	84	81	82	87	90	84	84	86	84	-	-	100	100
87.4	92.1	96.4	86	102	86	94	101	100	102	102	100	97	82	76	72	82	86	-	-	100	100
87.6	92.4	86.4	84	84	94	104	97	87	84	88	86	89	91	74	86	70	88	-	-	99	99
89.4	91.4	90.4	78	74	102	107	97	94	106	105	104	100	84	88	74	80	94	-	-	99	99
88.4	90.6	92.4	76	102	74	66	102	100	108	76	76	74	78	80	82	80	90	-	-	99	99
90.1	91.4	94.4	74	68	74	59	72	74	106	106	102	104	80	72	84	74	84	-	-	100	100
92.1	90.4	92.4	76	88	107	102	97	77	72	80	84	82	92	84	78	86	78	-	-	99	99
94.4	90.6	91.4	79	74	82	94	99	97	98	94	97	96	86	86	72	80	76	-	-	99	99
95.4	90.4	92.4	86	72	68	97	98	97	96	96	98	84	84	64	72	74	72	-	-	100	100
96.4	92.1	95	74	54	97	104	97	104	104	106	108	102	92	78	76	84	80	-	-	100	100
94.2	91.1	94.4	74	72	99	104	98	101	100	100	100	97	86	82	86	76	78	-	-	99	99
95.4	91.4	94.1	66	64	99	104	97	98	94	96	96	96	64	76	74	82	76	-	-	99	99
94.1	91.4	92.1	75	94	92	108	99	98	100	96	92	88	84	74	72	74	70	-	-	99	99
94.4	92.3	93.1	88	96	96	102	100	108	104	106	102	106	80	86	84	84	84	-	-	99	99
92.1	92	91.7	87	98	96	102	102	104	105	105	105	105	76	74	80	86	86	-	-	100	100
90.2	93.4	92.4	86	94	96	64	100	104	104	105	105	104	96	88	82	84	84	-	-	100	100
86.4	91.4	92.4	94	88	86	78	101	105	107	106	104	104	90	80	82	88	90	-	-	99	99
84.5	89.4	88.4	95	89	88	80	87	88	92	96	98	97	84	84	86	84	84	-	-	99	99
84.4	88.4	86.4	92	92	94	96	92	86	86	84	87	86	86	86	84	78	76	-	-	100	100
86.4	87	85.2	90	90	96	100	100	97	102	102	100	101	82	84	81	72	78	-	-	99	99
84.6	86.4	89.1	87	90	96	100	104	102	106	104	101	100	88	80	76	74	78	-	-	99	99
89.4	88.7	90.2	96	82	90	95	92	96	94	91	98	94	88	89	74	78	72	-	-	99	99
88.4	92.1	94	92	94	98	94	90	96	98	98	98	96	96	76	74	76	70	-	-	100	100

SPO2													F.P.S	P.M.S	A.R.S	L.V.R.S	RECALL	POST OP COMPLICATION			
loading dose		intra op						postop										hypo	brady	vomit	resp dep
6 min	10 min	15 min	20 min	25 min	30 min	35 min	40 min	1 min	30min	60 min	90min	120 min									
99	99	99	99	99	99	99	99	99	99	99	99	99	6	1	1	3	YES	no	no	no	no
100	100	100	100	100	100	100	100	100	100	100	100	100	4	1	2	4	YES	no	no	no	no
99	99	99	99	99	99	99	99	99	99	99	99	99	6	2	1	4	YES	no	no	no	no
99	99	99	99	99	99	99	99	99	99	99	99	99	6	1	2	4	YES	no	no	no	no
99	99	99	99	99	99	99	99	99	99	99	99	99	6	1	1	5	YES	yes	no	no	no
99	99	99	99	99	99	99	99	99	99	99	99	99	6	2	1	5	YES	no	no	no	no
100	100	100	100	100	100	100	100	100	100	100	100	100	4	1	2	5	YES	no	no	no	no
100	100	100	100	100	100	100	100	100	100	100	100	100	6	2	2	6	YES	no	no	no	no
100	100	100	100	100	100	100	100	100	100	100	100	100	4	1	2	6	NO	no	no	yes	no
99	99	99	99	99	99	99	99	99	99	99	99	99	6	3	3	3	YES	no	no	no	no
99	99	99	99	99	99	99	99	99	99	99	99	99	6	3	2	4	NO	no	no	no	no
99	99	99	99	99	99	99	99	99	99	99	99	99	6	1	2	3	YES	no	no	no	no
100	100	100	100	100	100	100	100	100	100	100	100	100	4	2	2	4	NO	no	no	no	no
99	99	99	99	99	99	99	99	99	99	99	99	99	8	1	1	4	YES	no	no	no	no
99	99	99	99	99	99	99	99	99	99	99	99	99	4	3	1	6	YES	no	no	no	no
100	100	100	100	100	100	100	100	100	100	100	100	100	8	1	2	6	YES	no	no	yes	no
100	100	100	100	100	100	100	100	100	100	100	100	100	8	3	2	5	NO	no	no	no	no
99	99	99	99	99	99	99	99	99	99	99	99	99	4	1	1	5	YES	no	no	no	no
99	99	99	99	99	99	99	99	99	99	99	99	99	2	1	2	3	YES	no	no	no	no
99	99	99	99	99	99	99	99	99	99	99	99	99	4	3	2	5	YES	no	no	no	no
99	99	99	99	99	99	99	99	99	99	99	99	99	2	1	1	6	NO	no	no	no	no
100	100	100	100	100	100	100	100	100	100	100	100	100	4	1	2	4	YES	no	no	no	no
100	100	100	100	100	100	100	100	100	100	100	100	100	6	3	2	4	YES	no	no	no	no
99	99	99	99	99	99	99	99	99	99	99	99	99	6	1	1	5	YES	no	no	no	no
99	99	99	99	99	99	99	99	99	99	99	99	99	6	2	2	4	YES	no	no	no	no
100	100	100	100	100	100	100	100	100	100	100	100	100	6	1	1	4	NO	no	no	no	no
99	99	99	99	99	99	99	99	99	99	99	99	99	6	2	2	5	YES	no	no	no	no
99	99	99	99	99	99	99	99	99	99	99	99	99	6	3	1	4	YES	no	no	no	no
99	99	99	99	99	99	99	99	99	99	99	99	99	6	1	1	6	YES	no	no	no	no
100	100	100	100	100	100	100	100	100	100	100	100	100	6	1	2	5	YES	no	no	no	no