COMPARISON OF REGIONAL WITH GENERAL ANESTHESIA TECHNIQUES FOR NON CARDIAC SURGERY IN PATIENT WITH ISCHEMIC HEART DISEASE.

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INTRODUCTION
As incidence of ischemic heart disease (IHD) has increased dramatically nowadays, we are finding at least one or two patients of IHD daily in operating lists of our hospital. It is a lifestyle disease and also found in younger age group.

Due to advancement in techniques and gazettes of surgery and anesthesia, more and more high risk patients are operated which includes IHD as a major risk group. The cardinal rule for anesthesia in IHD patients is that myocardial oxygen requirement should not be allowed to exceed myocardial oxygen supply. Myocardial oxygen demand can be reduced by reduction in heart rate and after load. Electrocardiograph (ECG) monitoring during anesthesia may reveal fresh events. (12) We have conducting a study in our hospital to evaluate better method of anesthesia for patients of ischemic heart disease operated for non cardiac surgery.

AIMS OF STUDY
1) To compare different regional anesthesia techniques with general anesthesia technique in patients of IHD undergoing non cardiac surgery.
2) To compare hemodynamic stability, heart rate, and blood pressure variability in different techniques.
3) To compare the complications (any new cardiac event) in different techniques.
MATERIAL AND METHODS
The study comprised of 100 patients of ischemic heart disease subjected to different non-cardiac surgeries under general anesthesia and under various regional anesthesia. Inclusion and exclusion criteria were decided.

INCLUSION CRITERIA
1. Patients having history of myocardial infarction in past.
2. ECG changes suggestive of myocardial ischemia, i.e. Asymptomatic T wave inversion, ST segment depression, Presence of pathological Q wave.(12)
3. Patients taking anti angina medication.
4. Patient with reports of TMT or coronary angiogram suggestive of IHD.
5. Patient with angina of exertion in NYHA class 1 or 2.
6. Patient for elective surgery and with sinus rhythm.

EXCLUSION CRITERIA
1. History of myocardial infarction in last 6months.
2. ECG changes in symptomatic patient-suggestive of acute myocardial ischemia.
3. Unstable patients.
4. Patients with angina on exertion NYHA class 3 or 4. patients showing echocardiography evidence of global left ventricular hypokinesia.
5. Patients with ejection fraction less than 50%.

Clinical examination included all the systems.
Base line routine investigations were done. Special investigation like 2D Echo was asked when needed. Procedure explained to the patients and VAS Score was explained & informed written consent was taken.

Patients were randomly allocated into two groups of 50 each.
1. **Group- A**: patients operated under general anesthesia.
2. **Group- B**: patients operated under regional anesthesia.

GROUP-A
Patients were pre medicated with intravenous inj. Glycopyrrolate + inj. Midazolam. General anesthesia was induced with sodium thiopentone Neuromuscular blockade was carried out with i.v. vecuronium bromide. mechanical ventilation with mixture of 50% oxygen, 50% nitrous oxide and isoflurane / sevoflurane(14) in low concentration. During surgery patients were monitored by multipara moniter, monitoring H.R, blood pressure, SpO₂, EtCo₂ and ECG. Postoperative analgesia was given with i.v. Tramadole and bupivacaine infiltration of the scar. Postoperative oxygen was supplied in ICU using oxygen mask until 4 hours.
GROUP –B
Procedure was explained to the patient. He was asked to communicate if any feeling of 
uncomfort he feels during the process..

All provisions for general anesthesia and all measures for resuscitation were kept ready.

SPINAL ANESTHESIA
2 to 2.5ml of Inj. bupivacaine 0.5% injected. Level of sensory block achieved was restricted to 
T10/T8.

EPIDURAL ANESTHESIA
0.5% Bupivacaine 2 mg/kg injected in the space. Epidural catheter was advanced for the 
purpose of post operative analgesia. Level of sensory block achieved was not higher than 
T10/T8 level.

PERIPHERAL NERVE BLOCK
With the help peripheral nerve locator, paresthesia was elicited, Inj. Bupivacaine 0.5% were 
given in a volume as per the need of the block. Through aseptic measures were taken. 
Heart rate, blood pressure, Spo2, ECG, were recorded at every five minutes.

CRITERIA FOR DEFINING COMPLICATIONS:
1. Persistence of new arrhythmia for more than a minute or ventricular ectopics more than 
   6 per minute were considered as complications.
2. Any positive or negative deviation of 20 mm of Hg in blood pressure or 20 beats per 
   minute in heart rate from baseline were considered significant for Group A patients.
3. For Group B patients, absolute heart rate of less than 60 / min. and more than 120 / min 
   were labeled as bradycardia and tachycardia respectively while systolic blood pressure 
   more than 150 (Hypertension) and less than 90 (hypotension), diastolic blood pressure 
   more than 90 (Hypertension) and less than 60 (Hypotension) were labeled accordingly. 
   Complications were treated adequately per operatively.
   Patients were monitored in ICU for 2 days postoperatively to look for development of 
   new ECG abnormalities, chest pain, respiratory problems and other complications. (30).

OBSERVATION AND RESULTS
Both groups were demographically comparable. Age group selected was ranging from 30-70 
years. Majority patients in both the groups belongs to 50-60 years (28%in group-A, 32% in 
group B), and 60-70 years (32% in group A, 28% in group B).
### TABLE I: PRESENCE OF CLINICAL RISK FACTORS IN BOTH GROUPS

<table>
<thead>
<tr>
<th></th>
<th>GROUP-A</th>
<th>GROUP-B</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MAJOR</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INTERMEDIATE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mild Angina (NYHA class I/II)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Prior MI(Q Wave / old MI in ECG)</td>
<td>1</td>
<td>4</td>
<td>0.17</td>
</tr>
<tr>
<td>Compensated Heart Failure</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Diabetes Mellitus</td>
<td>2</td>
<td>3</td>
<td>0.65</td>
</tr>
<tr>
<td>Renal insufficiency</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>MINOR</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advanced age (&gt;65)</td>
<td>3</td>
<td>4</td>
<td>0.70</td>
</tr>
<tr>
<td>Abnormal ECG</td>
<td>25</td>
<td>25</td>
<td>1</td>
</tr>
<tr>
<td>Rhythm other than sinus</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>H/O Stroke</td>
<td>0</td>
<td>1</td>
<td>0.31</td>
</tr>
<tr>
<td>Uncontrolled Hypertension (&gt; 140/90)</td>
<td>7</td>
<td>7</td>
<td>1</td>
</tr>
</tbody>
</table>

Debrata Mukerji and Eagle et al (2).
Most of the surgeries conducted in this study involved intermediate surgical risk.
In Group A, 50% patients were given isofluane and other 50% were given sevolurane.
In Group B, 48% patients were given Spinal anesthesia, 24% were given Epidural anesthesia, 28% were given nerve blocks.

### Table 2: INCIDENCE OF COMPLICATIONS IN GROUP A PATIENTS

<table>
<thead>
<tr>
<th></th>
<th>ISOFLURANE</th>
<th>SEVOFLURANE</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HYPOTENSION</strong></td>
<td>10 PATIENTS (40%)</td>
<td>7 PATIENTS (28%)</td>
<td>0.46</td>
</tr>
<tr>
<td><strong>HYPERTENSION</strong></td>
<td>12 PATIENTS (48%)</td>
<td>7 PATIENTS (28%)</td>
<td>0.25</td>
</tr>
<tr>
<td><strong>BRADYCARDIA</strong></td>
<td>1 PATIENT (4%)</td>
<td>3 PATIENTS (12%)</td>
<td>0.31</td>
</tr>
<tr>
<td><strong>TACHYCARDIA</strong></td>
<td>17 PATIENTS (68%)</td>
<td>3 PATIENTS (12%)</td>
<td>0.001</td>
</tr>
<tr>
<td><strong>ISCHEMIC CHANGES</strong></td>
<td>4 PATIENTS (16%)</td>
<td>NO PATIENT</td>
<td>0.04</td>
</tr>
<tr>
<td><strong>ARRHYTHEMIAS</strong></td>
<td>4 PATIENTS (16%)</td>
<td>NO PATIENT</td>
<td>0.04</td>
</tr>
</tbody>
</table>
Table 3: INCIDENCE OF COMPLICATIONS IN GROUP B PATIENTS

<table>
<thead>
<tr>
<th></th>
<th>SPINAL</th>
<th>EPIDURAL</th>
<th>NERVE BLOCK</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>HYPOTENSION</td>
<td>6 PATIENTS (24%)</td>
<td>2 PATIENTS (16%)</td>
<td>0 PATIENTS (0%)</td>
<td>0.03</td>
</tr>
<tr>
<td>HYPERTENSION</td>
<td>2 PATIENTS (4%)</td>
<td>0 PATIENTS (0%)</td>
<td>0 PATIENTS (0%)</td>
<td>0.13</td>
</tr>
<tr>
<td>BRADYCARDIA</td>
<td>2 PATIENTS (4%)</td>
<td>0 PATIENTS (0%)</td>
<td>0 PATIENTS (0%)</td>
<td>0.13</td>
</tr>
<tr>
<td>TACHYCARDIA</td>
<td>4 PATIENTS (8%)</td>
<td>0 PATIENTS (0%)</td>
<td>0 PATIENTS (0%)</td>
<td>0.01</td>
</tr>
<tr>
<td>ISCHEMIC CHANGES</td>
<td>2 PATIENTS (4%)</td>
<td>0 PATIENTS (0%)</td>
<td>NO PATIENT (0%)</td>
<td>0.13</td>
</tr>
<tr>
<td>ARRHYTHEMIAS</td>
<td>2 PATIENTS (4%)</td>
<td>0 PATIENTS (0%)</td>
<td>NO PATIENT (0%)</td>
<td>0.13</td>
</tr>
</tbody>
</table>

DISCUSSION & CONCLUSION.

Because of wide By careful understanding of the physiology of coronary circulation and knowing the factors that increase myocardial oxygen demand and factors that decrease myocardial oxygen supply, we can improve the anesthetic management of the patients with IHD undergoing noncardiac surgery. Availability of anesthestic agents, one can say that there is no universally accepted agents or techniques that apply to all patients of ischemic heart disease. Each patient should be treated as an individual with unique problems.

Preoperative optimization of blood pressure and heart rate is essential to achieve better outcome. Incidents of Post operative myocardial infarction and dangerous arrhythmias are more seen in IHD patients undergoing noncardiac surgery. (6) These patients should be kept in intensive care unit (ICU) for 2-3 post operative days. Beta blocker along with calcium channel blockers were used for the purpose. (8)

A comparison was made between general (group A) and various regional anesthesia (group B) techniques. Heart rate variability and blood pressure fluctuations were more apparent in group A patients, which were seen intra operatively (20 minutes after induction), in B group hemodynamic changes were seen during immediate post induction period. Elderly patients had higher complication rate in group-A. Postoperative minor complaints were more common in group-A (32% vs 8%). Overall complication rate was significantly higher in general anesthesia group (76%) as compared to regional anesthesia group (24%), in our study. There were more chances of fresh IHD - many times life threatening in elderly patients undergoing non cardiac surgery under General anesthesia. (9) General anesthesia was also less effective in relieving post operative pain as compared to regional anesthesia group irrespective of mode of analgesia used.

In group A, patients receiving sevoflurane as a maintenance agent suffered less cardiac complications as compared to patients receiving Isoflurane.(5). In group B, patients who were operated under peripheral nerve block had no complication as expected while epidural sub group was hemodynamically more stable than spinal sub group.
REFERENCES:


