A Review on Supplemental Oxygen Effects on Nausea and Vomiting in Patients under Spinal Anesthesia for Elective Cesarean

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ABSTRACT

Introduction: Nausea and vomiting is seen after surgery in 20 to 70 percent of cases. In some studies supplemental oxygen could decrease Nausea and vomiting after surgery and in other studies it had no positive effect to decrease Nausea and vomiting. So this study aims to study on using supplemental oxygen effects on Nausea and vomiting changes of elective cesarean in patient under spinal anesthesia.

Methods: 120 women who candidates for elective cesarean were chosen randomly for two-group intervention study. During the surgery and for six hours after surgery the intervention group received 60% oxygen and the control group received 30% oxygen with simple mask. The rate of Nausea and vomiting was recorded by visual tool (VAS) and the result was analyzed by SPSS19.

Result: the incidence of Nausea and vomiting during surgery, recovery and women ward was different but there was not meaningful difference. There was also no meaningful difference for the intensity of Nausea and vomiting between two groups.

Conclusion: in this study clinical trial to prescribe supplemental oxygen could not show any prevention role on Nausea and vomiting rather than routine oxygen.

Keywords: Nausea and vomiting, supplemental oxygen, cesarean, spinal anesthesia

INTRODUCTION

Nausea and vomiting is the most common complications after surgery. The mechanism of Nausea and vomiting includes vestibule stimulation and Cochlea in ear and stimulation of central chemical receptors and gastrointestinal local mechanisms. Outbreak of this is reported between 20-70% but in spinal anesthesia it is reported 66%. These complications may cause outpatients release delay, electrolyte disorders, wound dehiscence, increase of eye and skull pressure, tiredness and stress of patients, dehydration and wound bleed, increase of aspiration risk and release delay of recovery ward. Researches show that patients want to stop Nausea and vomiting after surgery even by spending more money or even suffering pain. There are researches which recommend using supplemental oxygen during and after surgery or acupuncture to prevent Nausea and vomiting after surgery. In abdominal surgeries, supplemental oxygen is prescribed after surgery for patients to prevent hypoxia and its complications. In cesareans, patients are at the risk of hypoxia for the high pressure on stomach and diaphragm and for the spinal anesthesia. And unfortunately cesarean is increasing and spinal anesthesia increases nausea and vomiting after surgery. Beside decrease of blood pressure, unrelated factors such as fatness, sex of patient and age can affect nausea and vomiting. According to the researches in some cases prescribing oxygen with high concentration decreased nausea and vomiting after surgery but in other cases it had no effect.
In the other word prescribing oxygen with high concentration had different effects in different researches. Qods and friends found a meaningful difference between using oxygen with 60% concentration with mask and using oxygen with 30% concentration with Canola and incidence and severity of nausea and vomiting after cesarean with general anesthesia. But Seydi and friends reported no meaningful difference for incidence of nausea and vomiting in recovery after 6 hours of the surgery. In some researches there was mentioned some limitations like lack of controlling mobile dizziness, alcohol and cigarette consumption which show incomplete control on distortive factors in those researches. So the researcher tried to have better control on mentioned limitations and to review effects of prescribing supplemental oxygen on nausea and vomiting after elective cesarean with spinal anesthesia in Asali educational hospital of Lorestan province in Iran.

METHODS

The randomized intervention was carried out on 120 women candidate for cesarean after receiving the code from ethic committee and clinical trial center of Iran IRCT and after acceptance of Asali educational hospital. On arrival to operating room necessary information was given to the patients and their testimonials were gathered. The samples divided into two groups (60 persons) based on block categorization and randomized numbers table and with considering parity and age matching of patients.

Qualified individuals for sampling including elective cesarean had to be fasting 6-8 hours before and after surgery, they had to have no symptotic digestive deseases, no moving desease, no diziness, no Cardiovascular and Pulmonary problems, no Middle ear diseases, diabetes, infectious diseases, fever, hypertension, side surgeries except cesarean, no smoke and alcohol consumption, no Immunosuppressive medications, no too much or unusual bleeding during surgery, no Hemoglobin higher than 10 per DL, no receiving any medication except antibiotic and one time painkiller until 6 hours after surgery.

All patients received spinal anesthesia woth same method. Before spinal anesthesia 500ML Ringer serum infused for patients and then100 mg Lidocaine Hayprbar injected to patients with needle No 25 and patinets sit in supaine position and their blood pressure and heart beats were measured and recorded per 1 and then per 5 minutes. The anesthesia team and nurses of the ward received necessary trainings.  The Shahed group received 30% oxygen 3-5 ml per minute with simple mask during surgery and in recovery ward. the Azmun group received 60% oxygen after surgery in recovery ward and for 6 hours in surgery ward. The results were recorded by two trained nurses as 10 oxygen venturi maks were recorded. In case of any problem like necessary general anesthesia, tough vomiting, unwillingness to continue cooperating or side surgery necessity patinets would be spared from the research. The data gathering tools included questionnaires and check lists which all demographic information of patients including nausea and vomiting condition during and after surgery for 6 hours recorded in them. Numbers of nausea and vomiting were measured and recorded by standard tools. Based on this tool numbers and intensity of nausea and vomiting is expressed from 0-10. O means no nausea and vomiting, 1-3 means slight nausea and vomiting, 4-7 means average nausea and vomiting and 8-10 means tough nausea and vomiting. Data was analyzed by SPSS which Anesthesiologists, obstetricians, and statistical consulting group operating room and anesthesia team chose it. Stability of the test achieves r=0.92 with retesting and Spearman correlation coefficient. All data and information of the test analyzed by SPSS 19 using independent T statistical and Chi-square methods. The meaningfulness of the tests was 0.05.
RESULTS

In this research 61 persons were studied in the intervention group and 59 persons were studied in the control group. The age of patients was between 18-42 years old and their average BMI was 30.55+3.30. The parity average was 2.11+0.86 and their hemoglobin was 12.1+0.77. Although the Peripheral oxygen saturation of patients in the intervention group was higher than the control group but based on the independent T test there was no meaningful difference for SPO2 in the first minute, during and last minutes of caesarean between the groups and based on the independent test the Chi square had no meaningful difference for nausea and vomiting during surgery. No meaningful difference seen for nausea and vomiting intensity P>0.05.

Table 1. Comparison of the incidence of nausea and vomiting during surgical

<table>
<thead>
<tr>
<th>Nausea and Vomiting</th>
<th>Test Group</th>
<th>Yes</th>
<th>No</th>
<th>P - Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Numbers</td>
<td>Percent</td>
<td>Numbers</td>
</tr>
<tr>
<td>Nausea</td>
<td>Intervention</td>
<td>26</td>
<td>42/6</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>27</td>
<td>45/8</td>
<td>32</td>
</tr>
<tr>
<td>Vomiting</td>
<td>Intervention</td>
<td>12</td>
<td>19/7</td>
<td>49</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>8</td>
<td>13/6</td>
<td>51</td>
</tr>
</tbody>
</table>

According to the independent T test there were no difference for Length of stay in the recovery room, systolic and diastolic pressure in the recovery room, recovery room temperature, SPO2 first minute last minute entry and stay in the recovery room between the intervention and control groups. Based on the independent test the Chi square had no meaningful difference for nausea and vomiting indication between the intervention and control groups (table 2) (P>0.05). Also there was no meaningful difference between nausea P=0.056 and vomiting P=0.191 in recovery for the two groups.

Table 2. Comparison of the incidence of nausea and vomiting in recovery

<table>
<thead>
<tr>
<th>Nausea and Vomiting</th>
<th>Test Group</th>
<th>Yes</th>
<th>No</th>
<th>P - Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Numbers</td>
<td>Percent</td>
<td>Numbers</td>
</tr>
<tr>
<td>Nausea</td>
<td>Intervention</td>
<td>7</td>
<td>11/5</td>
<td>54</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>13</td>
<td>22</td>
<td>46</td>
</tr>
<tr>
<td>Vomiting</td>
<td>Intervention</td>
<td>2</td>
<td>3/3</td>
<td>59</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>4</td>
<td>6/8</td>
<td>55</td>
</tr>
</tbody>
</table>

According to the independent T test there was no difference between the groups for Systolic and diastolic pressure in surgery ward. There was no meaningful difference between the two groups for SPO2 in first minutes entering surgery ward P=0.202 and six hours after surgery P=0.583. Based on the independent test the Chi square had no meaningful difference between nausea indication between two groups in surgery ward (table 3) and between vomiting intensity between the groups P=0.572. There was no vomiting in the groups.
Table 3. Comparison of the incidence of nausea and vomiting in surgery ward

<table>
<thead>
<tr>
<th>Intervention Group</th>
<th>Nausea</th>
<th>Yes</th>
<th>Percent</th>
<th>No</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention</td>
<td>Numbers</td>
<td>4</td>
<td>6/6</td>
<td>57</td>
<td>93/4</td>
</tr>
<tr>
<td>Control</td>
<td>Numbers</td>
<td>4</td>
<td>6/8</td>
<td>55</td>
<td>93/2</td>
</tr>
<tr>
<td>Total</td>
<td>Numbers</td>
<td>8</td>
<td>6/7</td>
<td>112</td>
<td>93/3</td>
</tr>
</tbody>
</table>

P=0.961

CONCLUSION

Results show conformance of groups. Patients were matched for parity, age and receiving medications and anesthesia method and these factors show balancing effects effective on nausea and vomiting after surgery. During studying on patients SPO2 no differences found. In different papers every change of Systolic pressure and ischemia and hypoxia mentioned as effective factors on nausea and vomiting but in the current research no meaningful difference found and it is good for the results.

According to the independent Chi square test no meaningful difference found between the groups for nausea and vomiting indication during surgery, in recovery and in Obstetrics and gynecology surgery ward in the other word there was no meaningful difference from beginning of surgery and six hours after surgery. Some researches confirmed it but Golfam, Sadrosadat and friends, Grif, Rincon and Wald reported positive effects of using supplemental oxygen for prevention of nausea and vomiting. Although our research protocol is same as Seyyedi but the results are different.

They found no meaningful difference in nausea and vomiting indication during surgery but they reported meaningful differences in recovery ward and 6 hours after surgery. Qods said: oxygen therapy can’t decrease nausea and vomiting for 60% after cesarean. Porhanden and friends compared using 30% and 80% oxygen and then 30% and 50% oxygen in Laparoscopy patients and they reported supplemental oxygen can’t decrease nausea and vomiting after surgery.

Ordic and Roy were first researchers who offered supplemental oxygen idea and two years later Grif and friends found about effects of supplemental oxygen on vomiting and then they reported positive effects of supplemental oxygen on decrease of nausea and vomiting after surgery in Laparoscopy. Gul confirmed that but later researches did not confirm it. Mucader and friends reject positive effects of Secretion of serotonin on decrease of nausea and vomiting after abdominal surgeries. Tatanja Simorina and friends in a research on 120 Laparoscopy patients prescribed 30%, 50% and 80% oxygen in early 2 hours of surgery and the supervised them till 24 hours and she reported that 50% and 80% oxygen without anti-nausea medication could not decrease or prevent nausea and vomiting but only high concentrated oxygen can prevent early vomiting. So even high concentrated oxygen can’t be recommended as an anti-nausea medication in surgeries such as gynecology laparoscopy. Dolaresem and friends researched on 30% and 80% oxygen in patients with general anesthesia and found no meaningful difference. Heydari and friends researched on orthopedic surgery patients under spinal anesthesia using 20%, 30% and 70% oxygen and they reported no meaningful difference.
Other studies reported meaningful difference for 80% oxygen and in other studies using supplemental oxygen under 80% no meaningful differences reported. So we can say that oxygen under 80% can’t prevent nausea and vomiting and using high concentrated oxygen for long terms has its bad complications. The different results might be for different methods of anesthesia. For example in surgeries with less abdominal manipulation oxygen had less effect. Our study includes abdominal surgery under spinal anesthesia and finally nausea and vomiting got controlled we also used venture mask for being sure about oxygen concentration. So according to the current study 60% supplemental oxygen can prevent vomiting. We also recommend more studies on different types of surgery. Our research has been carried out on elective cesarean in an educational hospital and the results of the current study can’t be generalized to all patients under surgery.

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