THE EFFECTS OF BETAMETHASONE ON REDUCING THE POSTOPERATIVE PAIN, NAUSEA, AND VOMITING

Mohammad-Hasan Esmaili MD*, Kambiz Kardan MD

Pain, nausea, and vomiting are among common complications seen after different types of surgeries which need medical attention. In this study we tried to evaluate the effects of short-acting betamethasone on postoperative pain, nausea, and vomiting. In a period of 4 months, from February until May 2000, 60 females with American Society of Anesthesiologists (ASA) class I or II undergoing elective gynecologic surgeries were enrolled into this prospective study. These patients were randomly assigned into 2 equal groups of 30 each. The procedures of induction [diazepam (0.1 mg/kg), morphine (0.1 mg/kg), thiopental (5mg/kg), and atracurium (0.5 mg/kg)], and maintenance [1 % halothane and oxygen (3 L/min) together with N₂O (3 L/min)] of anesthesia were the same for both groups. The study group received 8 mg of betamethasone IM just 10 min prior to the induction of anesthesia. We evaluated the frequency of postoperative pain of different intensities at 1st, 2nd, 3rd, 12th and 24th hr after the operation using verbal scores of 1 to 4 as follows: 1= no pain, 2= mild pain, 3= moderate pain, and 4= severe pain. At the same time, the frequencies of postoperative nausea and vomiting were determined in a similar fashion, scoring them from 1 to 3 as follows: 1= no nausea, 2= nausea, and 3= vomiting. Data were interpreted by Chi-square, Pearson’s, and Mantel-Haenszel tests, using SPSS software. P-values < 0.05 were considered as statistically significant. Patients of the study group experienced significantly less pain, nausea, and vomiting at the 1st, 2nd, and 3rd postoperative hours when compared to the control group. On the other hand, there was no significant difference between both groups at 12th and 24th hr after the surgery. We found that a single dose of betamethasone, administered intramuscular IM 10 min prior to the induction of anesthesia, had an acceptable analgesic and antiemetic effect, lasting for at least 3 hr after surgery. Due to its effectiveness in reducing the frequency of postoperative pain, nausea, and vomiting, we recommend the preinduction use of betamethasone.

Keywords • betamethasone • nausea and vomiting • postoperative pain

Introduction

Pain, nausea, and vomiting are among common complications seen after different types of surgeries which need medical attention. There have been different reports of analgesic and antiemetic properties of corticosteroids used during different types of operations.1–8

Aasboe et al9 have demonstrated the effectiveness of a combination of short-(phosphate) and long-acting (acetate) betamethasone on reducing postoperative pain, nausea, and vomiting. The effects of this combination had started after the 3rd postoperative hour and had lasted for a week. In this study we tried to find out the effects of short-acting type of betamethasone on the above-mentioned parameters at 1st, 2nd, 3rd, 12th, and 24th hr after the elective gynecologic surgeries and to see whether the observation made in the above study was due to the effect of betamethasone in combination or the long-acting type alone.

We did this prospective study on 60 female patients who underwent elective gynecologic surgeries in 2 hospitals of Zeinabieh and Shaheed
The effects of betamethasone on reducing the postoperative pain, nausea, and vomiting

Faghihi, affiliated to Shiraz University of Medical Sciences, in a period of 4 months from February through May 2000.

Patients and Methods

All patients aged over 20 years and belonged to the American Society of Anesthesiologists (ASA) class I or II. These patients had not been on corticosteroids either for long-term or within a week prior to the operation. All patients denied using analgesics of any type in a week prior to the operation and did not complain of having pain, nausea, or vomiting before the induction of anesthesia. There was also no history of active gastric ulcer or presence of allergy to any kind of drug.

The patients were randomly assigned into 2 equal control and study groups of 30 members each. The procedures of induction and maintenance of the anesthesia were the same for both groups. We induced the anesthesia using thiopental (5 mg/kg), and atracurium (0.5 mg/kg), diazepam (0.1 mg/kg), morphine (0.1 mg/kg), and maintained it by 1% halothane and oxygen (3 L/min) together with N2O (3 L/min). In all patients the anesthesia was reversed using atropine (1.25 mg) and neostigmine (2.5 mg). After the beginning of the spontaneous breathing, the patients were extubated, and they were transferred to the recovery rooms where they were kept for 3 hr for preliminary evaluation.

Only the study group received 8 mg of short-acting betamethasone intramuscularly (IM) in the gluteal region 10 min prior to the induction of anesthesia. As planned, after the operation and in the recovery room the members of both groups were questioned with regard to the intensity of pain, nausea, and vomiting they experienced.

Pain was verbally scored from 1 to 4 as follows: 1) no pain; 2) mild (patient responded to a single dose of oral 325 mg acetaminophen); 3) moderate (patient did not respond to acetaminophen but did so to nonsteroidal antiinflammatory drug [NSAID]); and 4) severe (patient just responded to narcotics and none of the aforementioned regimens).

When necessary, acetaminophen was given orally, the effect of which was usually observed after 30 min. If required, diclofenac was the NSAID that was given IM, (the effects usually observed within minutes). Nausea and vomiting were similarly scored from 1 to 3 as follows: 1) neither nausea nor vomiting; 2) nausea; and 3) vomiting. Finally, we recorded the frequency of the above-mentioned scores at 1st, 2nd, 3rd, 12th, and 24th hr after the operation.

Statistical analysis

Data were interpreted by Chi-square, Pearson’s, and Mantel-Haenszel tests, using SPSS software. P-values smaller than 0.05 were considered as statistically significant. To have a reliable statistical inference from the obtained data, the categories of nausea and vomiting at 1st, 2nd, 3rd, 12th, and 24th hr after the surgery (Table 1), mild and severe pain at the 1st, 2nd, and 3rd postoperative hours (Table 2), and that of “no pain and mild pain” together with “moderate and severe pain” at 12th and 24th hr after the operation (Table 3) were considered together, due to low number of subjects in each respective category.

Table 1. The frequency rate of postoperative nausea and vomiting at 1st, 2nd, 3rd, 12th, and 24th hr after the surgery.

<table>
<thead>
<tr>
<th>Hours after surgery</th>
<th>Number (%) of patients in the study group with</th>
<th>Number (%) of patients in the control group with</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No nausea</td>
<td>Nausea/Vomiting</td>
</tr>
<tr>
<td>1st</td>
<td>18 (60.0)</td>
<td>12 (40.0)</td>
</tr>
<tr>
<td>2nd</td>
<td>11 (36.7)</td>
<td>19 (63.3)</td>
</tr>
<tr>
<td>3rd</td>
<td>15 (50.0)</td>
<td>15 (50.0)</td>
</tr>
<tr>
<td>12th</td>
<td>30 (100)</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td>24th</td>
<td>30 (100)</td>
<td>0 (0.0)</td>
</tr>
</tbody>
</table>

*p < 0.05; †: not significant.

Table 2. The frequency of postoperative pain with different intensities at 1st, 2nd, and 3rd hr after the surgery.

<table>
<thead>
<tr>
<th>Hours after surgery</th>
<th>Number (%) of patients in the study group with</th>
<th>Number (%) of patients in the control group with</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No pain</td>
<td>Mild pain</td>
</tr>
<tr>
<td>1st</td>
<td>17 (56.7)</td>
<td>11 (36.7)</td>
</tr>
<tr>
<td>2nd</td>
<td>11 (36.7)</td>
<td>16 (53.3)</td>
</tr>
<tr>
<td>3rd</td>
<td>10 (33.3)</td>
<td>17 (56.7)</td>
</tr>
</tbody>
</table>

*p < 0.05.
 Results

The results are summarized in Tables 1, 2, and 3. As it is evident from Table 1, at the 1st, 2nd, and 3rd postoperative hours, betamethasone could significantly decrease the frequency of both nausea and vomiting in the study group compared to the control (p < 0.05). Though the difference between either group at 12th hr after the surgery was quite obvious, however, it was not significant. At the 24th postoperative hour none of the patients in either group had nausea or vomiting. Table 2 clearly shows the difference between the study and the control groups as to the frequency of the pain at the 1st, 2nd, and 3rd postoperative hours, which turned out to be significant (p < 0.05). Table 3 shows that the observed difference between both groups, with regard to the frequency of postoperative pain at 12th and 24th hr, was not significant.

<table>
<thead>
<tr>
<th>Hours after surgery</th>
<th>Number (%) of patients in the study group with</th>
<th>Number (%) of patients in the control group with</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No /Mild pain</td>
<td>Moderate/Severe pain</td>
</tr>
<tr>
<td>12</td>
<td>2 (6.7)</td>
<td>28 (93.3)</td>
</tr>
<tr>
<td>24</td>
<td>5 (10.0)</td>
<td>27 (90.0)</td>
</tr>
</tbody>
</table>

†: not significant.

Discussion

Our findings showed that betamethasone could effectively reduce the frequency of postoperative nausea, vomiting, and pain during the 1st, 2nd, and 3rd hr after the surgery. These results are in line with other reports highlighting the effectiveness of corticosteroids in reducing postoperative pain in oral and orthopedic surgeries, operation of tonsil, and cholecystectomy.1 – 8 Skjelbred et al12 showed that the injection of betamethasone IM is highly effective in reducing the pain during the 3 postoperative hours after dental surgery. Methylprednisolone was shown to be as effective as paracetamol in reducing the postoperative pain after oral surgery.13

In other reports the effectiveness of corticosteroids against nausea and vomiting was demonstrated.14 – 18 Asaboe and his colleagues9 showed that betamethasone (50% acetate and 50% phosphate) was effective against postoperative pain, nausea, and vomiting. This effect had started almost 3 hr after the surgery and had lasted for a week. The major difference between their study and ours was that the effect of betamethasone in combination had started with delay, and had lasted for a longer period of time.

Asaboe et al9 had put forward a question as to whether the effect seen in that study was due to the property of long-acting betamethasone or due to the use of betamethasone in both forms of short- and long-acting. The current study answers the above-mentioned dilemma in that the presence of the long-acting type of betamethasone alone, due to its delayed absorption, was responsible for the delayed response, which had in turn lasted for a longer period of time. We recommend the preinduction use of betamethasone in reducing the frequency of postoperative pain, nausea, and vomiting.

References

11 Wong HY. Nonopioid analgesia use in the
The effects of betamethasone on reducing the postoperative pain, nausea, and vomiting

preoperative period. Physiological and Pharmacological Basis of Anaesthesia; 1996: 559 – 600.


