Original article

Use of ondansetron to prevent postspinal morphine induced vomiting

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Background: The use of Ondansetron, a selective serotonin type 3 (5-hydroxytryptamine [5-HT3] antagonists has been used to prevent postspinal morphine induced vomiting in post-surgical cases. Besides this it has been widely used for the prevention of vomiting induced by chemtherapy post-anaesthesia and radiotherapy.

Methods: A prospective study was carried out for the use of ondansterone to prevent morphine induced post spinal vomiting in vaginal hysterectomy cases at Gaur, Mahottari district in eastern part of Nepal from 02 - 12 - 2006 to 09- 12- 2006. A total of 100 cases were taken in the study.

Result: Among the 100 cases of postspinal morphine 15 case (15%) found to have episodes of vomiting,5% cases reported mild pruritus and 10% had complains of pain, but even a single case did not have respiratory depression.

Conclusion: Use of Ondansetron can decrease the incidence of nausea and vomiting produced by intrathecal morphine however many studies have revealed no significant difference between the placebo group.

Key words: Ondansterone, Morphine, spinal anesthesia, vomiting

Introduction

Ondansetron is a potent and highly selective 5-HT receptor antagonist.Its presise mode of action in the control of nausea and vomiting is not known.However it is thought that by blocking a reflex initiated in the gut by many chemicals which release 5- HT and also the release of 5- HT in the chemoreceptor trigger zone (CTZ) results in prevention of nausea and vomiting. Besides this it increases nociceptive threshold by modulating spinal nociceptive responses .By blocking the serotonin receptors in the spinal cord which influences pain perception in the spinal cord by involving in antinociceptive mechanism [1]

Ondansetron has been introduced for the prevention and treatment of emesis produced by opioids , general anesthesia, radiotherapy and post-chemotherapy conditions.

Nausea and vomiting induced by intrathecal or epidural opioids are likely the result of cephalad migration of drug in C.S .F and subsequent interaction with opiod recepters located in the area postrema.[2] Another contributing factor for nausea and vomiting following morphine administration is due to sensitization of vestibular system, decrease in gastric emptying time, and *its direct action on dopamine receptors of the CTZ in the area postrema*.[3]

Among the all side effects,the most feared side effects of intrathecal morphine is respiratory depression.Life threatening respiratory depresswion has been reported following intrathecal use of morphine.[3]Following lumbar intrathecal Morphine administration, respiratory depression is maximal when peak concentration of morphine is attained in the medulla. Delayed respiratory depression has been seen 6 – 12 hours following intrathecal or epidural administration of Morphine, yet may persists 24 hours[4].

The use of epidural and spinal morphine along with Bupivacaine has been used as good post operative pain management in many surgical conditions. The analgesic

effect of intrathecal morphine is due to its action on opioid receptors in the substantia gelatinosa in the dorsal horn of spinal cord and in the supraspinal level.In majority of cases intrathecal Morphine has shown its analgesic effect for a period up to 24 hours, *because of its low lipid solubility than other opioids*[5]

Material and methods

This is a prospective study which was conducted at Gaur, Rautahat district eastern part of Nepal from 02- 12 – 06 to 09- 12-06 at camp. A total of 100 cases of vaginal hysterectomy of ASA 1 and 2 were selected for the study. All patients were explained about the study and informed consent was obtained from them.

All the patients were given oral dose of 2gm of Tinidazole, 750mg of Ciprofloxacin, 300mg of Ranitidine, and 5mg of Diazepam a day before surgery. They were preloaded with 1000-ml of Ringer lactate solution just before surgery.use of Ondansetron 4mg IV given to all the patients 5 minutes before spinal anesthesia. Baseline BP recorded 30 minutes prior spinal anesthesia and Intra operatiively BP was monitored in every 3- 5 minutes and compared with baseline value at 5, 10, 20, 40, and 60 minutes interval. The number of patients who had, nausea and vomiting werel assessd over 24 hours after surgery ,according to following score along with the Post operative pain intensity scored with visual analogue scale (VAS) as given in table 1. For the patients who had more than one episode of vomiting and nausea for more than 30 minutes were given IV 10mg of metoclopramide.Similarly the patients who had moderate to severe pain were given IM 75mg of diclofenac sodium or 50mg of pethidine plus promethazine 25mg IM or both as patient demands.

Table1: Scoring Table

Nausea & vomiting Score
0 = No emetic symptoms
1 = Nausea only
2 = vomiting
Post operative pain intensity scored with visual analogue scale (VAS)
> 7 ------Severe pain
3 – 7 -----Moderate pain
< 3 -----Light or no pain
Sedation score
4 ---Completely awake, Open eyes
3----Drosy, closed eyes
2----Asleep, responds to oral call
1----Asleep responds to touch or pain
0-----Does not responds

Results

Table 2: Distribution of the cases in different age groups.

(n= 100)	
Age in years	**Frequency**
25 - 35	22
36 - 45	38
46 - 55	21
> 56	19
Total	**100**
Mean ± SD	**45.1 ± 12.2 years**

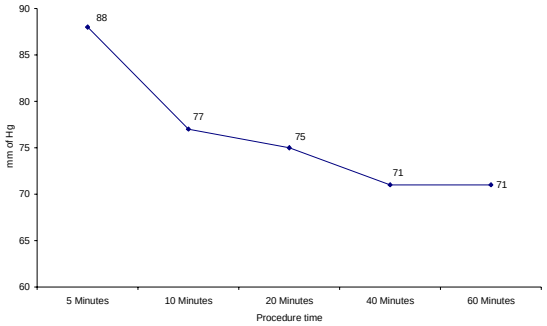

Fig. 1 : MAP change from base line MAP (84mm of Hg)

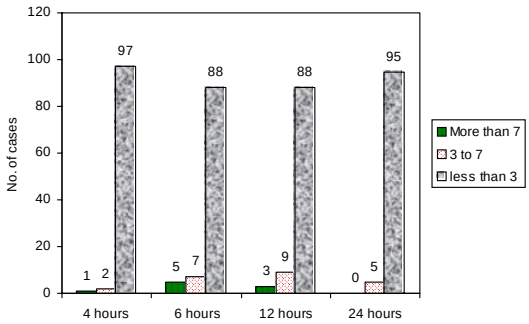

Fig. 2 : Pain Intensity Score

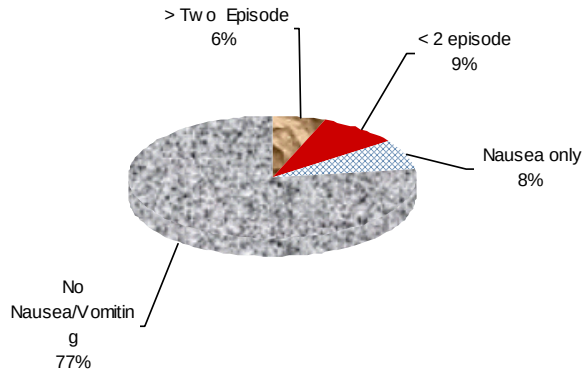

Fig. 3: Nausea and vomiting

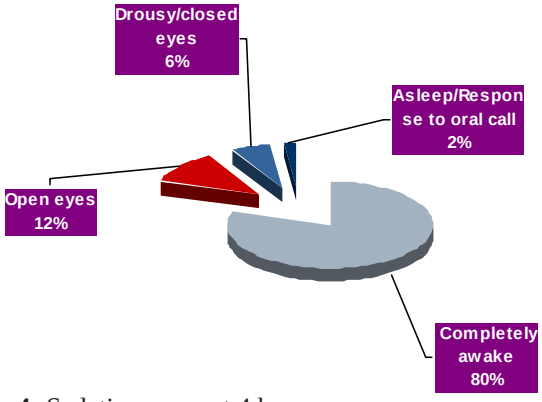

Fig. 4: Sedation score at 4 hours

Discussion

Post-spinal morphine induced nausea and vomiting is one of the most unpleasant conditions to the patients.

To overcome this side effect many authors have recommended many drugs in their studies.

The incidence of nausea and vomiting is seen different according to type of surgery and type of anesthesia given. Various studies performed by many authors on many drugs to prevent morphine induced postspinal nausea and vomiting have revealed different result.

In our study done on the use of Ondansetron to prevent intrathecal morphine induced vomiting has shown 23% incidence of nausea and vomiting.

The study done by Bromage Pr.et.al.[2], on incidence of nausea and vomiting following intrathecal opioids have revealed approximately 30% incidence. To compare with this study there is no statistically significant difference between our study (p value >0.05).[2]

In another study done by A.J Peixoto, et.al[6] on Ondansetron or Droperidol for prophylaxis of nausea and vomiting on 132 cases of cesaerean section after intrathecal morphine.They have revealed the 10% incidence of nausea and vomiting on Ondansetron 4mg group.Which is statistically significant with our result.(p value 0.02)[6]

Another study done by Dasilva, P.H.D.P et.al. on the efficacy of prophylactic ondansetron and other drugs to prevent nausea and vomiting after major gynaecological surgeries have revealed 37% incidence of nausea and vomiting on Ondansetron 4mg group(p value 0.03)[7]

Similarly the study done by J.H RAPHAEL et.al.on antiemetic efficacy of prophylactic Ondansetron in laproscopic syrgery have revealed 18 % incidence of vomiting with ondansetron group(p value 0.38) while the incidence of nausea and vomiting is 53% with Metoclopramide group (p value 0.00001).[8]

Epidural or spinal morphine has been used in number of other non surgical cases including cancer patients.De Leon-Casasola , et al. have given their experience in management of 4227 cancer patients. They used 0.1% Bupivacaine and 0.01% Morphine at a rate of 5 – 10 ml per hour to keep the pain score <5/10. They have shown the 22% incidence 0f nausea and vomiting.This result is not significantly different with the result obtained from our study (p value=0.81). The incidence of pruritus in this study is 22%.while our study shows only 5%. Statistically it is highly significant with our study(p value<0.0001).The most fearful side effects of intrathecal or epidural morphine is respiratory depression even though we did not noticed even a single case of respiratory depression in our study in contrast they have revealed 0.07% of respiratory depression.[9]

Conclusion

Use of Ondansetron can decrease the incidence of nausea and vomiting produced by intrathecal morphine however many studies have revealed no significant difference between the placebo group.

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