POSTOPERATIVE NAUSEA AND VOMITING IN KORLE BU TEACHING HOSPITAL

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SUMMARY

Objective: Postoperative nausea and vomiting (PONV) is one of the most distressing morbidities associated with surgery. Even though the incidence can be as high as 30% elsewhere no work has been done to assess the incidence in any health facility in Ghana. This study was carried out to find out the incidence, risk factors and the management of PONV in a tertiary healthcare facility.

Design: This was a prospective study.

Setting: The study was carried out in Korle Bu Teaching Hospital (KBTH).

Subjects and Methods: All patients above the age of 18 years who had surgery including general surgery were included in the study. Information obtained using a questionnaire included demographic data, the type of anaesthesia, the incidence of PONV and its management.

Results: Three hundred and six (306) completed forms out of 322 questionnaires were analyzed. One hundred and six patients (34%) had episodes of PONV of whom 82 (77.4%) had intra-operative opioids. Of the other factors only age was found to be a risk factor with patients in the 20-49 age group constituting 71.8% (p= 0.007). Eleven out of 93 patients who reported the episode to a health worker received medication for their PONV. Drugs used included promethazine and antimalaria.

Conclusions: Thirty-four percent of patients in the study had PONV indicating that the problem is not uncommon among post-surgical patients in KBTH. Awareness of the problem should be highlighted and adequate management should be given to all patients. Patients at risk should be identified and appropriate management instituted.

Keywords: Postoperative, nausea, vomiting, opioids

INTRODUCTION

One of the most distressing morbidities associated with surgical operations is postoperative nausea and vomiting (PONV). The incidence has been variously reported as between 25-30%.[1] In ambulatory care surgery setting PONV can lead to unanticipated hospital admission resulting in increased costs and inconvenience to patients.[2]

Majority of surgical interventions are for benign conditions. Any morbidity therefore experienced by patients is of greater concern to the patients and sometimes their relatives. In one study, patients reported that the avoidance of PONV was of greater concern than the avoidance of pain.[3] Patients with previous experience of PONV may show more concern about the possible recurrence of PONV than the surgery itself.

No previous work on PONV has been published from the Korle Bu Teaching Hospital (KBTH), the largest tertiary hospital in Ghana. This study was carried out to determine the incidence of PONV at KBTH, associated risk factors and its management.

SUBJECTS AND METHODS

This prospective study was carried out in June to August and December 2004. All patients aged 18 years and above who had the following types of surgery were included: general surgical, gynaecological, orthopaedics, ear, nose and throat operations. The purpose of the study was explained to the patients and after that a verbal consent was obtained. A questionnaire was administered to each patient in order to collect the following information: age, sex, weight, duration and type of surgery and anaesthesia and all the drugs used. Other information included episodes and time interval between the end of anaesthesia and PONV and the management. The patients were followed up for 48 hours postoperatively.

Microsoft Access was used to capture the data and SPSS version 13.0 was used for the analysis. Chi-square was used to test the differences in frequency of episodes and student t-test was used to compare mean weight and age for frequency of nausea and vomiting. P-value of less than 0.05 was considered as statistically significant.

RESULTS

Three hundred and six (306) completed forms out of 322 questionnaires administered were analyzed. There

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were 94 (30.7%) males and 212 (69.3%) females giving an approximate ratio of 1:2. Their mean age was 41.2 years ±14.5 and the mean weight 70.3kg ±13.0. Of the 306 patients whose data were analyzed PONV occurred in 106 (34.6%) of whom 78 (73.6%) were females and 28 (26.4%) were males. There was no significant difference between the sexes, P=0.235. Forty five patients (42.5%) had nausea and vomiting, 39 (36.8%) had nausea only, 21 (19.8%) vomiting only and 1 (0.9%) had vomiting with retching.

Table 1 The weight groups of the patients and episodes of PONV

Weight groups in kg	Episodes of PONV
40 – 49	7
50 – 59	16
60 – 69	28
70 – 79	30
80+	25
Total	**106**

Fifty-seven (53.8%) of the patients had one episode of PONV, 29 (27.4%) had two episodes and one patient (0.94%) had seven episodes. The episode of PONV occurred between 2-6 hours after surgery in 52 (49.0%) of the patients and between 6-24 hours in 38 (35.8%) of the patients. The episodes of PONV increased with increasing body weight. The differences were not statistically significant p=0.587(Table 1).

Table 2 Age groups and incidence of PONV

Age groups (years)	PONV Present (%)	Absent (%)	Total
<20	7(6.6)	8(4.0)	15
20-29	22(20.8)	27(13.5)	49
30-39	29(27.4)	53(26.5)	82
40-49	25(23.6)	55(27.5)	80
50-59	8(7.5)	35(17.5)	43
60-69	3(2.8)	15(7.5)	18
70+	12(11.3)	7(3.5)	19
Total	**106(100)**	**200(100)**	**306**

The highest incidence of PONV occurred between the ages of 20 and 49 years. This group constituted 71.8% of the patients who had PONV. This finding was statistically significant p = 0.007 (Table 2)

Two hundred and forty patients had general anaesthesia (GA) out of which 81 (33.8%) had PONV. Twenty-four out of 63 (38.1%) patients who had regional anaesthesia (RA) had PONV and 1 out of 3 patients who had combined GA and RA had PONV. The incidence of PONV in relation to the types of anaesthesia was not statistically significant; p=0.811.

The induction agents used were thiopentone (155), propofol (54), midazolam (28) and ketamine (9). The induction agents used did not statistically influence the incidence of PONV p=0.559.

The following opioids namely: pethidine (226), morphine (12) and fentanyl (8), were given intra-operatively to 246 patients the commonest being pethidine. Eighty-two (33.3%) out of 246 patients who received intra-operative opioids had PONV. This number constituted 77.4% of all the patients who had PONV. There was no significant difference between the 3 opioids used p=0.596% (Table 3).

Table 3 Intraoperative opioids and PONV

Opioids	PONV Present	Absent	Total
Pethidine	74	152	226
Morphine	4	8	12
Fentanyl	4	4	8
Total	**82**	**164**	**246**

There was no significant difference between the patients who had surgical procedures in the different surgical categories and PONV, p=0.576. There was also no difference between elective and emergency surgery, p=0.696. The duration of surgery and the observed frequency did not correlate with PONV.

Diclofenac suppository for postoperative analgesia was given to 112 patients and pethidine to 94 patients. PONV occurred in 46 (41.1%) and 29 (30.9%) respectively in those who received diclofenac and pethidine. The difference was not significant, p=0.129.

Ninety-three (87.7%) patients who had PONV informed a health worker: a doctor, a nurse or an orderly. Some of the reasons given by 13 PONV patients who did not inform any health worker are shown in Table 4.

Table 4 Some stated reasons for not informing a health worker

i. The episode was short lived
ii. It was not a big problem
iii. It was not necessary
iv. It was not severe
v. Patient was not asked about PONV

Only 11 (11.8%) out of the 93 patients who reported their episodes of PONV received any medications. The drugs used were promethazine, metoclopramide and antimalaria. Majority of the patients were reassured or given a bowl. There was no indication as to the effectiveness of the drug therapy.

DISCUSSION

The study shows that the incidence of PONV is not uncommon in the surgical patients in KBTH. The incidence of PONV of 34.6% found in this study is similar to those reported by previous authors.[3]

A multifactorial aetiology, including patient specific, anaesthetic, surgical and postoperative factors has been suggested[2]**.** Apfel et al[4] did a study involving 2722 patients from two centres who received inhalational anaesthetic without antiemetic prophylaxis for various types of operation. In that study 4 predictors of PONV were identified namely: the female gender, history of motion sickness or previous PONV, non smoking and the use of postoperative opioids. The likelihood of PONV is 10% in those with no risk factors, 21% in those with two, 39% in the presence of three and 79% in those with four risk factors.

In this study there was no difference between females and males. This could perhaps be due to the smaller number of patients in this study. No previous history of PONV or motion sickness was ascertained hence their contributions to PONV in this study cannot be determined.

In an earlier study involving ear, nose and throat surgical patients, Apfel et al found that young age is also a risk factor[5]. The result of this study which showed that 77.7% of the patients who had PONV were below 50 years of age, confirmed that young age is a risk factor. This high incidence in the young patients may be due to the fact that they are more likely to complain about PONV than the older patient. There is also the possibility that young patients may have a high autonomic tone and respond more adversely to the anaesthetic agents and analgesics including opioids.

Anaesthetic technique is also considered an important risk factor. Induction agents, maintenance and the use of intra-operative opiods have all been implicated in PONV. Although propofol is known for its anti-emetic effect this, however, was not seen in this study.

The risk associated with the use of intra-operative opioids was seen in this study. Opioids can produce nausea and vomiting by direct stimulation of the chemoreceptor trigger zone (CTZ) and also cause delayed gastric emptying and reduction in gastrointestinal motility.[6] There was no statistical difference between pethidine, morphine and fentanyl in relation to PONV. This may be due to the small number of patients who received morphine and fentanyl compared to those who received pethidine. A previous study had indicated that the incidence of PONV associated with fentanyl is lower than that of the longer acting opioids. This difference may be due to the shorter duration of action of fentanyl rather than any inherent anti-emetic effect.[7]

There was no difference in the incidence of PONV between pethidine and diclofenac suppositories; the most common drugs used for postoperative analgesia in this hospital. The decision to use either of these drugs should therefore be guided by the severity of the pain and availability of the drugs.

Anaesthetic complications such as hypotension and hypoxia may also predispose to PONV. In a study by Greif et al[8] high concentration of supplemental oxygen (80%) reduced the incidence of PONV significantly in patients undergoing colonic resection. The efficacy of supplemental higher concentration of oxygen intraoperatively in the prevention of PONV was however not seen in patients who had modified radical mastectomy.[9]

The exact mechanism of prevention of PONV by oxygen is not known. The hypothesis is that CTZ is sensitive to dopamine and serotonin and that hyperoxia decreases dopamine release by the carotid bodies and reduces serotonin release by ameliorating intestinal ischaemia.[8,10]

Goll et al[10] compared ondansetron and supplemental oxygen in the prevention of PONV. Their conclusion was that there was no difference between the two. They further stated that since oxygen is inexpensive and essentially risk-free, they preferred supplemental oxygen to ondansetron for the reduction of PONV. High concentration of oxygen may however increase the risk of awareness, atelectasis and surgical fires.[9]

Most studies of PONV have been done in patients given opioid based general anaesthesia. Studies involving RA usually centred on factors such as the intensity of the block and that PONV was of secondary importance. There was no difference between the patients who had GA and those who had RA in the incidence of PONV in this study.

Several mechanisms have been implicated as the causes of PONV associated with RA especially spinal anaesthesia. Crocker and Vandam[11] in a retrospective study found that factors such as hypotension, high spi-

nal block, use of vasopressors and recently opioids like fentanyl and morphine as part of regional anaesthesia contributed to PONV. Fentanyl is commonly used during spinal anaesthesia in this hospital. Fentanyl a lipophilic agent, carries less risk of PONV than morphine or pethidine.

Certain surgical procedures such as ear, nose and throat surgery, laparotomy, gynaecological laparoscopy are known to be associated with a high incidence of PONV. This was however not found in this study.

Forty-nine percent of the patients had PONV within 2-6 hours after surgery. In a previous study by Amponsah[12], 62% of the patients had PONV within 0-6 hours. This is the period during which the patient may still be under the influence of anaesthetic agents.

The small percentage of patients, 11.8%, who received treatment for PONV is a reflection of how health workers view the clinical significance of PONV. This finding is similar to an earlier study by Amponsah[12] where only 9.1% of the patients who had PONV received any medication.

PONV can lead to a number of unwanted side effects including fluid and electrolyte imbalance, wound dehiscence, delayed discharge of day care patients[13], unanticipated hospitalization of day care patients[14] with extra costs to the patient and the hospital. Increasingly there is a trend towards day care surgery therefore these last two factors have become important considerations.

PONV can lead to a lot of stress for the patient, their relatives and health workers and create major negative impact on patient satisfaction and overall surgical experience. In one study patients reported that avoidance of PONV was of greater concern than avoidance of postoperative pain.[15]

The management of PONV includes adequate hydration, oxygenation and anti-emetics. Various drugs have been used in the management including anticholinergics, antihistamines, phenothiazines, benzamides, butyrophenones and more recently dexamethasone and 5-HT3- receptor antagonists.

In general no drug used for prophylaxis should be readministered as treatment in the immediate postoperative period. An agent from a different pharmacologic class should be used since the prophylactic drug is deemed to have failed. A combination of drugs may be needed in severe cases especially in patients with 2 or more risk factors.

CONCLUSION

The incidence of PONV in the surgical patients of this hospital is high and all health care providers should be aware of this problem. They should be able to identify patients at risk and those with two or more risk factors should receive prophylaxis and other preventive measures to minimize the incidence of PONV. Further studies should be done in other health institutions and if this high incidence is confirmed a consensus policy on the identification of patients at risk and their management can then be instituted nationally.

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