

IMPORTANT ASPECTS IN THE MANAGEMENT OF POSTOPERATIVE NAUSEA AND VOMITING

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Abstract: Nausea and vomiting are some of the most frequent postoperative incidents, which have a significant negative influence on the patient's progression and, implicitly, on the quality of postoperative recovery, as well as on their life, in terms of the comfort of postintervention and satisfaction with the care received. In order to properly manage the prevention and treatment of PONV, the recommendations of the guidelines must be followed, starting from the PONV risk assessment and informing the patient about this risk, followed by appropriate pre-operative preparation, with sufficient hydration, choosing the most appropriate type of anesthesia, depending on the patient's profile and the level of risk for PONV, the use of associated anti-emetic regimens with proven efficacy to ensure rapid solution of problems and implicit psychological and physical comfort of the patient.

INTRODUCTION

Nausea and vomiting are some of the most frequent postoperative incidents, which have a significant negative influence on the patient's progression and, implicitly, on the quality of postoperative recovery, as well as on their life, in terms of the comfort of postintervention and satisfaction with the care received. Studies of their incidence show a high percentage, between 20-30% to 70-80%, the upper limits being reached in the population with a high risk of occurrence of these manifestations.^(1,2) Although, clinically, they do not generate serious consequences but rather psychological impairment (patient fear is more related to nausea and vomiting than to pain, as results from the questionnaires (3,4) the postoperative occurrence of these events leads to the resumption of delayed supply to the bone, the impossibility of early mobilization of the patient, possible dehiscence of the wound operator due to the vomiting effort, which leads to an increase in the number of hospitalization days with up to 25% (5) and of costs. These manifestations may occur separately or in combination, with different or concomitant times of occurrence, duration and response to discrete anti-emetic therapy on a case-by-case basis.

Under these circumstances, identifying the factors favoring the occurrence of these incidents, correlates with the type and duration of intervention and anesthesia, establishing optimal prevention measures and defining an effective antiemetic treatment system which is important for both surgeon, anesthetist, as well as for the care team. All this is done in the context of preoperative and postoperative care, defined in clear directions: clinical, respiratory, cardiovascular, neuromuscular monitoring, temperature monitoring, pain, drainage, bleeding, fluid balance. Besides these monitoring, the postoperative scheme should include and provide an infusion requirement derived from the required metabolism of water and electrolytes, as well as compensation for abnormal losses, nutritional needs, optimal and effective analgesia, prevention of complications.⁽⁶⁾

PURPOSE

- identifying the frequency of postoperative vomiting in the

studied group

- storage of risk factors for postoperative vomiting
- determining the profile of the patient at high risk of postoperative nausea and vomiting (PONV)
- stabilizing the influence of the type of anesthesia and surgery on the occurrence of vomiting
- identifying the most effective antiemetic therapies.

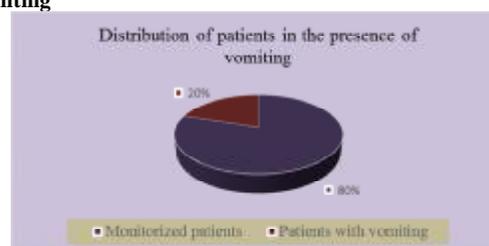
MATERIALS AND METHODS

In the study we monitored a batch of 200 patients with surgery in the immediate postoperative period in the Intensive Care Unit of the Emergency Clinical Hospital in Craiova for a 4-month period (July-October 2016). The data were collected from the general clinical observation sheets and the centralized and processed intensive care sheets by applying predefined criteria of distributions. The results have been translated into graphs to facilitate understanding and to highlight some correlations, thus making comparisons with the conclusions of various studies in the literature. All the steps were taken in compliance with the deontological norms of the research and the legal provisions regarding the processing of personal data.

RESULTS AND DISCUSSIONS

The postoperative surveillance of 200 patients surprised the occurrence of vomiting in 50 of them, which means an incidence of 25%, the result similar to those in the literature.

Figure no. 1. Distribution of patients in the presence of vomiting



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CLINICAL ASPECTS

Thus, the risk factors involved in triggering PONV are divided into three categories: patient-dependent factors, anesthesia factors and factors related to the type of surgery, as outlined in the following table:(7)

Table no. 1. Risk Factors for PONV in Adults (Adaptation by Ionescu, D. et al, 2009)

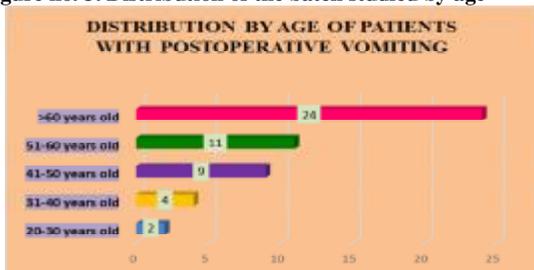
A. Patient-dependent risk factors	Female sex
	Non-smoking
	A history of PONV / motion sickness
B. Anesthetic risk factors	Use of volatile anesthetics
	Use of Protoxide Nitrogen
	Intraoperative and postoperative opioid administration
C. Surgical Risk Factors	Duration of surgery
	Type of surgery

The distribution of the batch studied according to the sex of the patients shows a predominance of women with a M/W ratio of 2.33, comparable to the results of studies on the subject, which indicate the occurrence of postoperative nausea and vomiting in a number of women about 3 times higher than that of men.(8)

Figure no. 2. Distribution of batch by sex

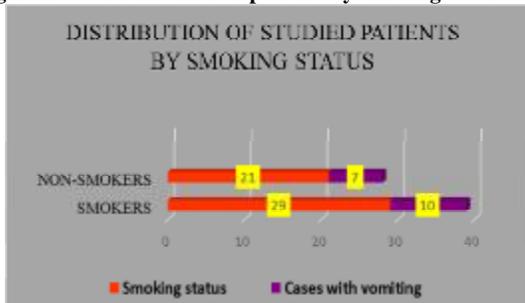


Figure no. 3. Distribution of the batch studied by age



Although not mentioned as a risk factor, age is an important element contributing to establishing the demographic profile of the patient presenting PONV. Age distribution of patients shows that PONV has an increased frequency in the range of 51-60 years, but especially for patients older than 60.

Figure no. 4. Distribution of patients by smoking status



In the literature, a decrease in the incidence of PONV

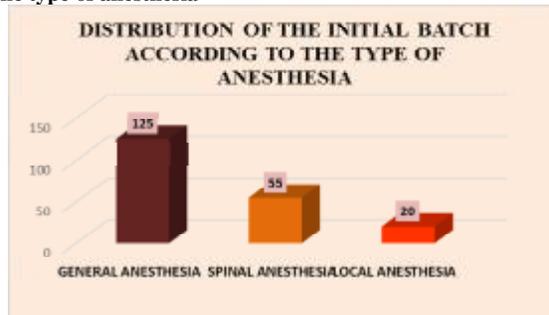
is reported while aging, but this analysis criterion should not be considered individually, but in conjunction with other aspects, such as duration and type of anesthesia and intervention, location of intervention, associated pathology.

Another risk factor for PONV is the non-smoking status. Analysing patients in the study group, we found an incidence of PONV almost equal in non-smokers (33.33%) as compared to smokers (34.48%).

The percentages obtained may be considered to be in contradiction to the findings of some small-scale research, indicating a doubling of the risk of developing PONV for non-smokers. The theory underlying this predominance evokes the influence of a polycyclic aromatic hydrocarbon contained in cigarette smoke on the metabolism of volatile anesthetics with an emetic effect, but the mechanism is poorly known and the data insufficient.(8) The results for the smoker category are justified by the fact that a smoker can develop a postoperative complication more often than a non-smoker because the amount of oxygen is lower and, correlated with general anesthesia and surgery, may adversely affect postoperative progression, even the healing of the wound.

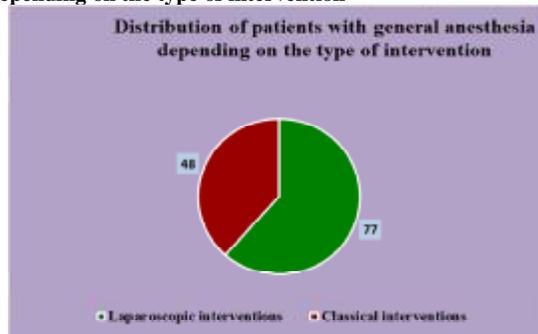
The incidence of PONV in the studied group is closely related to the type of anesthesia and surgery. It was considered useful to analyse the initial batch from this perspective because the literature indicates a significant increase of PONV frequency in general anesthesia, regardless of the volatile anesthetic used.

Figure no. 5. Distribution of the initial batch according to the type of anesthesia



The prevalence of general anesthesia was noted, and regarding the type of surgery with this form of anesthesia, put of 125 patients, 77 patients underwent laparoscopic interventions and 48 patients underwent classical surgical procedures.

Figure no. 6. Distribution of patients with general anesthesia depending on the type of intervention

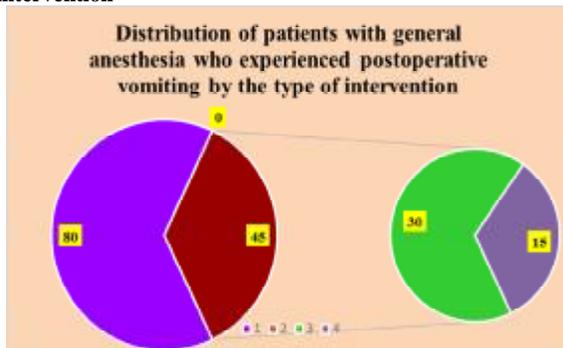


The subgroup of patients with general anesthesia who had postoperative vomiting was divided as follows: 30 patients underwent laparoscopic surgery and 15 patients classic surgery. It can be seen that the number of patients who had vomiting after laparoscopic surgery was higher than those who had

CLINICAL ASPECTS

undergone a classic intervention, a situation justified by the very type of anesthesia, thus supporting its categorization as an important risk factor in the occurrence of PONV. Laparoscopic surgery also appears as a non-mutagenic risk factor for PONV, along with specific localisation of surgery – breast, abdominal, pelvic.(9)

Figure no. 7. Distribution of patients with general anesthesia who experienced postoperative vomiting by the type of intervention

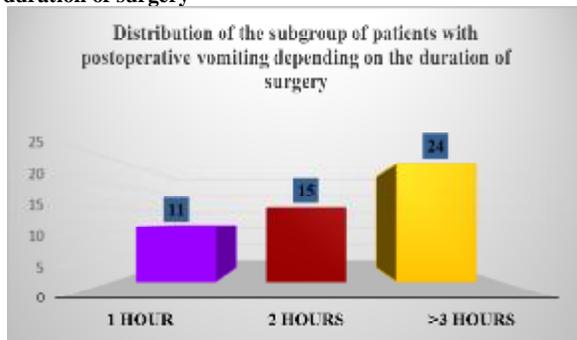


Patients operated under rahianeasia had a low incidence of PONV (9.09%) versus 36%, the percentage of those with general anesthesia. It should be noted that those with local anesthesia did not show PONV.

The previously identified aspects will guide to the recommendations of the specialist guides to opt for locoregional anesthesia when the patient's condition and type of intervention allow it, reduction/avoidance of the use of volatile anesthetics and nitrous oxide, avoidance of intra and postoperative use of opioids, effective preoperative hydration of the patient.(11) In addition to hydration, glucose administration at the end of the surgery, except for diabetic patients, is useful in the prevention of PONV.(11,12)

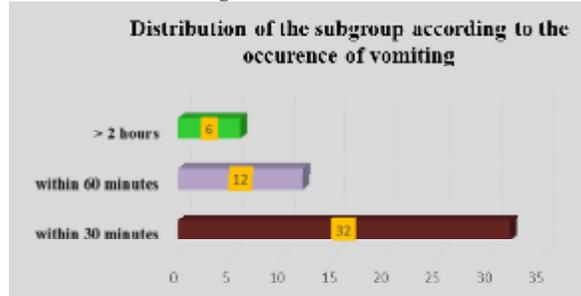
Another important aspect to consider in assessing the risk of PONV is the duration of surgery, equivalent to the duration of anesthesia and the period of exposure to the anesthetic. The 25% incidence of PONV in monitored surgical patients is clearly influenced by the fact that 78% of those affected had had interventions lasting over 2 hours.

Figure no. 8. Distribution of the batch depending on the duration of surgery



PONV may occur in single or repetitive episodes in the immediate postoperative period with the possibility of prolongation up to 5 days after the intervention.(13) For the studied group, PONV increased within the first 30 minutes postoperatively for more than half of the patients (64%). 24% of them had vomiting episodes at one hour after the surgery and only 12% had problems more than 2 hours after the surgery.

Figure no. 9. Distribution of patients according to the occurrence of vomiting



In order to combat PONV in the studied group we used Dexamethasone, Ondasetron, and Metoclopramide, administered separately or in combination, demonstrating that the combination of antiemetics can be successfully used and with notable effects by rheur aggregation. Thus, the 50 patients were structured in 5 subgroups of 10 patients each, of which in 2 groups we used antiemetic monotherapy, in another 2 groups antiemetic association, and at the last group we added the antiemetic propofol and glucose.

Figure no. 10. Distribution of the batch according to the antiemetic therapy used



Dexamethasone is a glucocorticoid which, being administered at the beginning of surgery at a dose of 4-8 milligrams blocks in the digestive tract the local synthesis of prostaglandins, acting on the mucus, decreasing its amount but also acting on hydrochloric acid and pepsin in the sense of stimulating their secretion. In addition, dexamethasone also has an anti-inflammatory and anti-allergic effect (decreases capillary permeability, inhibits phospholipase A2, blocks cyclooxygenase 2, immunoprecipitant effect, decreases cytokine production and T lymphocytes).(6,14) Ondasetron is a 5-HT3 antagonist that is given at a dose of 1-4 milligrams at the end of surgery, resulting in minimal side effects: headache, constipation.(15,16) Metoclopramide, a type 2 dopamine receptor antagonist (from the chemoreceptor site and the nucleus of the solitary tract), blocks the H1 receptors, and has a prokinetic effect in the digestive tract. It is given in the dose of 10-30 milligrams.(14) Propofol used in minimal doses diminishes intestinal peristalsis by blocking calcium channels, thus exhibiting an antiemetic effect.(6)

The monitoring of these sub-classes with regard to the patient's efficacy, tolerability and satisfaction with the care received, satisfaction assessed by the postoperative comfort level due to rapid PONV, showed positive results in anti-hemagglutinin subgroups (16 patients out of 20), compared to the ratio of monotherapy subgroups (9/20). Also, the beneficial effect of propofol in combination with antiemetic and glucose was demonstrated in 8 out of 10 patients. These results are in line with those in the literature that highlights the individual

CLINICAL ASPECTS

efficacy of these antiemetics in PONV, with a risk reduction of approximately 25%, but especially their cumulative action when administered in associated therapy.(17)

Other measures to prevent and combat PONV have been mentioned over the years in specialized papers, such as supplementary oxygen administration, the use of remifentanyl (short-acting opioid) instead of fentanyl, gastric tube decompression, and even acupuncture. Regarding the effectiveness of supplemental oxygen, it no longer supports the findings of various research (18) and is therefore not recommended in the guidelines of PONV prevention and treatment. A study of 5,000 patients did not reveal a decrease in the incidence of PONV due to the replacement of fentanyl with remifentanyl.(8) The use of acupuncture, or stimulation of P6 acupuncture, is likely to have similar effects to antiemetic medication (19), but it is more difficult to apply as an effective way to prevent PONV in our current practice.

CONCLUSIONS

Post operative nausea and vomiting are a matter of concern in the pre- and post-operative management of the patient due to their increased incidence, the multitude of risk factors for these events and the important consequences they have on the patient's evolution and satisfaction but also on the health system by influencing costs. The profile of the patient with high risk of PONV resulting from the present study is defined by the following characteristics: female sex, over 50 years of age, smokers who undergo laparoscopic surgery under general anesthesia with a duration greater than 3 hours and who show vomiting in the first 30 minutes postoperatively.

In order to properly manage the prevention and treatment of PONV, the recommendations of the guidelines must be followed, starting from the PONV risk assessment and informing the patient about this risk, followed by appropriate pre-operative preparation, with sufficient hydration, choosing the most appropriate type of anesthesia, depending on the patient's profile and the level of risk for PONV, the use of associated anti-emetic regimens with proven efficacy to ensure rapid solution of problems and implicit psychological and physical comfort of the patient.

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