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Profilaxia de Náuseas e Vômitos Pós-Operatórios em Obesos Mórbidos Submetidos a Gastroplastias por Laparoscopias. Estudo Comparativo entre Três Métodos *

*Prophylaxis of Postoperative Nausea and Vomiting in Morbidly Obese Patients Undergoing Laparoscopic Gastroplasties. A Comparative Study among Three Methods**

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RESUMO

Mendes MN, Monteiro RS, Martins FANC - Profilaxia de Náuseas e Vômitos Pós-Operatórios em Obesos Mórbidos Submetidos a Gastroplastias por Laparoscopias. Estudo Comparativo entre Três Métodos.

JUSTIFICATIVA E OBJETIVOS*: As intervenções cirúrgicas bariátricas videolaparoscópicas são associadas à alta incidência de náuseas e vômitos pós-operatórios. Estes eventos podem levar a significativa morbidade, aumentam o custo da internação e levam à insatisfação dos pacientes. O objetivo desse estudo foi comparar diferentes esquemas para a prevenção de náuseas e vômitos no pós-operatório de gastroplastias videolaparoscópicas.*

MÉTODO*: Estudo prospectivo ao acaso com 77 pacientes submetidos à gastroplastia videolaparoscópica. Foram divididos em: grupo Cont, controle (n = 19) sem administração de qualquer antiemético; grupo Dexa (n = 16) administrado dexametasona; grupo Onda (n = 20), ondansetrona; grupo Dexa + Onda (n = 22), associação das duas últimas medicações. Para todos os pacientes foi feita anestesia padronizada e analgesia pós-operatória com morfina por via venosa. Foram excluídos do estudo aqueles que faziam uso prévio de protetores gástricos ou antieméticos, bem como portadores de hérnia hiatal. Foram registrados os dados demográficos, duração da operação, dose de morfina usada e ocorrência de náuseas e vômitos no pós-operatório imediato (até seis horas).*

RESULTADOS*: Não houve diferença estatística entre os grupos com relação aos dados demográficos e doses de morfina usadas (One-way ANOVA). A incidência de náusea e/ou vômito em cada grupo foi: grupo Cont - 78,94%; grupo Dexa - 62,5%; grupo Onda - 50% e grupo Dexa + Onda - 18,8% (p = 0,0002).*

CONCLUSÕES*: A incidência de náusea e/ou vômito pós-operatórios em gastroplastia videolaparoscópica é reduzida com a associação ondansetrona e dexametasona de forma mais eficaz do que o uso isolado dessas medicações.*

Unitermos: CIRURGIA: gastroplastias: videolaparoscópica; COMPLICAÇÕES: náusea e vômito; DOENÇAS, Obesidade: mórbida.

SUMMARY

Mendes MN, Monteiro RS, Martins FANC –Prophylaxis of Postoperative Nausea and Vomiting in Morbidly Obese Patients Undergoing Laparoscopic Gastroplasties. A Comparative Study among Three Methods.

BACKGROUND AND OBJECTIVES: *Videolaparoscopic bariatric surgeries are associated with a high incidence of postoperative nausea and vomiting. Those events can lead to significant morbidity, increase hospitalization costs, as well as patient dissatisfaction. The objective of this study was to compare different prophylaxis protocols of postoperative nausea and vomiting in videolaparoscopic gastroplasties.*

METHODS: *This is a randomized prospective study with 77 patients undergoing videolaparoscopic gastroplasty. Patients were divided into four groups as follows: Cont group, control (n = 19) where antiemetics were not administered; Dexa group (n = 16), patients received dexamethasone; Onda group (n = 20), patients received ondansetron; and Dexa+Onda group (n = 22), patients received dexamethasone and ondansetron. All patients underwent standardized anesthesia and postoperative analgesia with intravenous morphine. Patients who were taking gastric protectors or antiemetics and those with hiatal hernia were excluded. Demographic data, duration of the surgery, doses of morphine, and development of nausea and vomiting in the immediate postoperative period (up to six hours) were recorded.*

RESULTS: *Demographic data and doses of morphine administered did not differ among the groups (One-way ANOVA). The incidence of nausea and/or vomiting in the different groups was: Cont group – 78.94%; Dexa group – 62.25%; Onda group – 50%; and Dexa+Onda group – 18.8% (p = 0.0002).*

CONCLUSIONS: *The incidence of postoperative nausea and vomiting in videolaparoscopic gastroplasties was more effectively reduced with the association of ondansetron and dexamethasone than with each drug separately.*

Keywords: COMPLICATIONS: nausea and vomiting; DISEASES, Obesity: morbid; SURGERY: gastroplasty: videolaparoscopic.

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Prophylaxis of Postoperative Nausea and Vomiting in Morbidly Obese Patients Undergoing Laparoscopic Gastroplasties. A Comparative Study among Three Methods

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INTRODUCTION

Despite the continuing investigation and development of new drugs and techniques, postoperative nausea and vomiting (PONV) are still frequent and contribute to increase hospital costs, delay discharge from the hospital, demand unexpected hospitalizations, and decrease patient satisfaction[1]. Postoperative nausea and vomiting usually develop in the first 24 postoperative hours and can lead to significant morbidity since, in abdominal surgeries, the increase in intra-abdominal pressure jeopardizes the stitches, increases central venous pressure, and increase the risk of aspiration of gastric contents. Electrolyte imbalances and an increase in intracranial pressure can also be observed. The effort during vomiting increases postoperative pain and autonomous responses[1,2].

The etiology of nausea and vomiting can be related with gender, age, weight, history of PONV, smoking, fear and anxiety, pain, hypotension, and dehydration. The presence of conditions that affect the gastroesophageal junction, such as hiatal hernia and obesity, besides the presence of blood and secretions in the stomach, can increase the incidence of PONV. The choice of anesthetic technique (opioids, nitrous oxide, and halogenated anesthetics) and place and duration of the surgery are also important factors[2].

Videolaparoscopic gastroplasties are associated with a high incidence of postoperative nausea and vomiting and the number of those procedures has been increasing progressively, hence the need to search for methods to prevent those undesirable events in this patient population[3]. Several drugs can be used in the prophylaxis of postoperative nausea and vomiting and among them we should mention: dexamethasone and ondansetron, which are widely used.

Ondansetron, a serotonergic receptor (5-HT3) antagonist, is particularly useful in the treatment of PONV related to blood-induced stimulation of gastric enterochromaffin cells, and it has been the most accepted drug in the prophylaxis of PONV in patients with more risk factors[2].

Dexamethasone, a corticosteroid with an unknown antiemetic effect, is also used very often in the prevention of PONV, especially in association with other drugs[2].

The objective of this study was to compare the efficacy of dexamethasone and ondansetron, alone or in combination, in the prophylaxis of postoperative nausea and vomiting in patients with morbid obesity.

METHODS

After approval by the Medical Ethics on Research Committee of the Hospital Santa Rita (São Paulo, SP, Brazil), 77 patients ages 20 to 56 years, ASA II, body mass index (BMI) $\geq$ 35 $kg.m^{-2}$ undergoing videolaparoscopic gastroplasty participated in the prospective clinical study. Patients taking gastric protectors or antiemetics as well as those with hiatal hernia were excluded.

Patients were randomly divided into four groups according to the antiemetic drug administered: Cont group (n = 19), control group, patients did not receive any antiemetic drug; Dexa group (n = 16), 0.1 $mg.kg^{-1}$ of Dexamethasone corrected for body weight (BW) up to a maximum of 10 mg; Onda group (n = 20), ondansetron 0.1 $mg.kg^{-1}$ of BW up to 8 mg; and Dexa+Onda group (n = 22), in which both drugs in the doses mentioned above were associated.

In the operating room, monitoring consisted of: electrocardioscope, pulse oximeter, automatic non-invasive blood pres-

Table I – Anthropometric Data, Duration of the Surgery, and Doses of Morphine

Parameter/Group	Control	Dexamethasone	Ondansetron	Association	p
Age (years)	33.8 ± 8.78	35.31 ± 7.92	38.2 ± 9.89	37.45 ± 9.37	0.41
BMI (kg.m^{-2})	40 ± 1.7	40.71 ± 5.02	43.99 ± 5.19	42.57 ± 5.91	0.12
Duration of surgery (min)	133.4 ± 36.18	122.5 ± 38.73	153 ± 45.86	151 ± 49.54	0.11
Doses of morphine (mg)	4.66 ± 2.58	4.87 ± 2.09	3.35 ± 2.92	4.66 ± 2.17	0.21

Results expressed as Mean ± SD

sure, and capnograph with inspiratory and expiratory gas analyzer. After venipuncture and oxygenation with 100% O_2 all patients underwent standardized anesthetic induction with fentanyl (5 μg.kg^{-1} of BW), propofol (2 mg.kg^{-1} of BW) and atracurium (0.5 mg.kg^{-1} of BW), and maintenance with remifentanil (0.1 to 0.3 μg.kg^{-1}.min^{-1} of BW) and 1% isoflurane in a mixture with oxygen and medical air (1:1).

Patients were maintained in controlled ventilation with a flow of 2 L.min^{-1}, tidal volume 8 to 10 mL.kg^{-1} of BW, FiO_2 0.5, and adequate respiratory rate to maintain the expired fraction of expired CO_2 around 35 to 40 mmHg.

Ketoprofen 100 mg, and dypirone 2 g, administered immediately after anesthetic induction were used as adjunct to analgesia, along with morphine 0.08 mg.kg^{-1} of BW 30 minutes before the end of the surgery.

At the end of the surgery, atropine and neostigmine were used to reverse the neuromuscular blockade and patients were extubated. They were transferred to the post-anesthetic unit care (PACU), where an anesthesiologist unaware of which group the patient belonged to, evaluated patients periodically for the presence of nausea and vomiting. Dimenidrate 50 mg was administered to patients who developed those undesirable effects.

The following parameters were evaluated: anthropometric data, duration of the surgery, and dose of morphine. The incidence of postoperative nausea and vomiting in each group was also recorded. One Way ANOVA was used for the statistical analysis of the anthropometric data, dose of morphine, and duration of the surgery. The incidence of PONV in patients in the four groups was analyzed by the Chi-square test for tendencies.

RESULTS

All groups were homogenous for age, body mass index (BMI), duration of the surgery, and dose of morphine (Table I). One Way ANOVA did not detect statistically significant differences among them. As for the incidence of nausea and vomiting (Figure 1), it was observed that: the Cont group presented in the first six postoperative hours a 78.94% incidence of nausea and vomiting; in the Dexa (Dexamethasone) group 62.50% of patients developed PONV; in the Onda (Ondansetron) group the incidence of PONV was 50%; and in the Dexa+Onda group 18.18%. Using the Chi-square test for tendencies a p= 0.0002 was observed implying a significant linear tendency between treatment and the reduction in the incidence of nausea and vomiting. The association of dexamethasone and ondansetron showed better results than each drug alone.

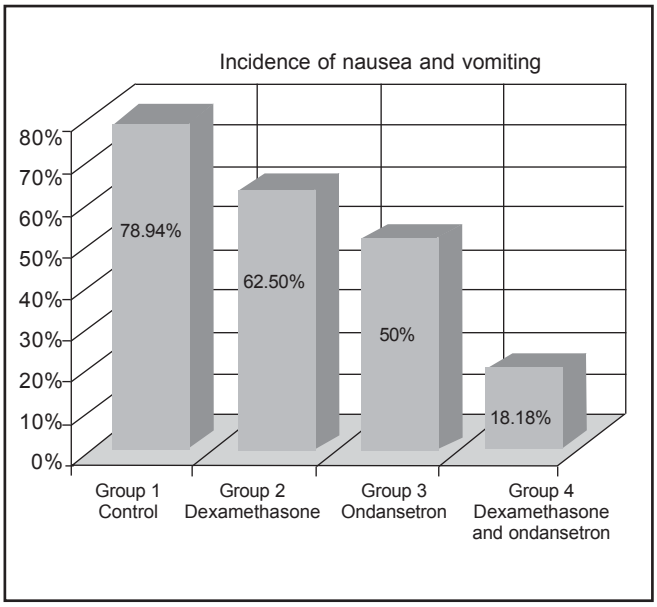

Figure 1 – Incidence of Nausea and Vomiting in Each Group

DISCUSSION

Anthropometric parameters did not show significant differences among the study groups. A correlation between obesity and greater incidence of postoperative nausea and vomiting is known to exist. In the present study, statistically significant differences among the study groups in body mass index were not observed. Similarly, the mean age of the patients did not differ among all four groups. Older individuals have an increased tendency to develop nausea and vomiting after anesthesia-surgeries. The duration of the surgery, another determinant factor for the development of postoperative nausea and vomiting, did not differ among the groups.

The etiology of nausea and vomiting is multifactorial and it is related with four types of neurotransmitters: serotonin,

dopamine, acetylcholine, and histamine, that modulate the chemoreceptor trigger zone located in the area postrema[4].

Antiemetics are classified according to their action on receptors found in this area and normally affect one of them; therefore, the use of a single drug might not be adequate and the association of two or more drugs might be necessary to obtain better results, which was observed in the present study with the association dexamethasone-ondansetron[4-6]. Ondansetron is an antagonist of 5-HT3 receptors and exerts its actions by inhibiting the release of serotonin by enterochromaffin cells in the stomach; those receptors are found in the termination of afferent fibers that travel in the vagus nerve to the postrema region of the solitary tract nucleus, responsible for emesis. As for dexamethasone, although its mechanism of action is unknown, it is believed to be due to the antagonism of prostaglandins or by the reduction in the secretion of intestinal serotonin. It has been suggested that when used in combination with other drugs the dose should not exceed 10 mg[7-9].

Several studies have proved the superiority of the multimodal prophylaxis in the control of postoperative nausea and vomiting when compared to the use of a single drug or placebo (control group) [10-11]. According to the literature, ondansetron has been shown to be more effective than placebo in the prophylaxis and treatment of PONV. Very few undesirable effects have been recorded after a single or multiple doses of this drug[9]. McKenzie et al. observed in a double-blind randomized study with 180 women undergoing general anesthesia for gynecological surgeries that the combination of ondansetron and dexamethasone was superior to the combination of ondansetron and placebo[9].

In a study by Habib et al. with patients undergoing videolaparoscopic cholecystectomy, 90% of the patients in the group that received multimodal therapy did not develop nausea and vomiting in the first two postoperative hours ($p < 0.05$) [10].

The results of the present study also demonstrate the superiority of the combination of antiemetic drugs over the use of a single drug in the prevention of postoperative nausea and vomiting.

Studies demonstrating the efficacy and/or superiority of alternative treatments in the prophylaxis of postoperative nausea and vomiting in morbidly obese patients undergoing videolaparoscopic gastroplasty are lacking. In the present study, it was observed that those undesirable effects can have an incidence of almost 80% when prophylaxis is not used (control group). The inclusion of a control group in the present study was possible because rescue treatment with dimenidrate was readily available. On the other hand, due to the presence of important risk factors for the development of postoperative nausea and/or vomiting, i.e., obesity and peritoneal insufflation with carbon dioxide, prophylaxis with a combination of drugs is mandatory.

Under the conditions of the present study, the association of dexamethasone and ondansetron was superior to each drug separately in reducing the incidence of postoperative nausea and vomiting of morbidly obese patients undergoing videolaparoscopic gastroplasty.

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RESUMEN

Mendes MN, Monteiro RS, Martins FANC - Profilaxis de Náuseas y Vómitos Postoperatorios en Obesos Mórbidos Sometidos a la Gastroplastia por Laparoscopías. Estudio Comparativo entre Tres Métodos.

JUSTIFICATIVA Y OBJETIVOS*: Las intervenciones quirúrgicas bariátricas videolaparoscópicas están asociadas a la alta incidencia de náuseas y vómitos postoperatorios. Esos eventos pueden conllevar a una significativa morbidez, aumentan el coste del ingreso y conllevan a la insatisfacción de los pacientes. El objetivo de este estudio, fue comparar diferentes esquemas para la prevención de náuseas y vómitos en el postoperatorio de gastroplastias videolaparoscópicas.*

***MÉTODO**: Estudio prospectivo hecho al azar con 77 pacientes sometidos a la gastroplastia videolaparoscópica. Fueron divididos en: grupo Cont, control (n = 19) sin administración de cualquier antiemético; grupo Dexa (n = 16) administrado dexametasona; grupo Onda (n = 20), ondansetrona; grupo Dexa + Onda (n = 22), asociación de las dos últimas medicaciones. Para todos los pacientes se aplicó una anestesia estandarizada y una analgesia postoperatoria con morfina por vía venosa. Se excluyeron del estudio aquellos que usaban protectores gástricos o antieméticos, como también portadores de hernia de hiato. Se registraron los datos demográficos, duración de la operación, dosis de morfina usada y el aparecimiento de náuseas y vómitos en el postoperatorio inmediato (hasta seis horas).*

***RESULTADOS**: No hubo diferencia estadística entre los grupos con relación a los datos demográficos y a las dosis de morfina usadas (One-way ANOVA). La incidencia de náusea y/o vómito en cada grupo fue: grupo Cont - 78,94%; grupo Dexa - 62,5%; grupo Onda - 50% y grupo Dexa + Onda - 18,8% (p = 0,0002).*

***CONCLUSIONES:** La incidencia de náusea y/o vómito postoperatorios en gastroplastia videolaparoscópica queda reducida con la combinación de la ondansetrona y la dexametasona de forma más eficaz que con el uso aislado de esas mismas medicaciones.*