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SCIENTIFIC ARTICLE

Use of positive pressure in pre and intraoperative of bariatric surgery and its effect on the time of extubation

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KEYWORDS
Diseases;
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Abstract
Background and objective: To investigate the influence of intraoperative and preoperative positive pressure in the time of extubation in patients undergoing bariatric surgery.
Method: Randomized clinical trial, in which 40 individuals with a body mass index between 40 and 55 kg/m^2, age between 25 and 55 years, nonsmokers, underwent bariatric surgery type Roux-en-Y gastric bypass by laparotomy and with normal preoperative pulmonary function were randomized into the following groups: G-pre ($n = 10$): individuals who received treatment with noninvasive positive pressure before surgery for 1 h; G-intra ($n = 10$): individuals who received positive end-expiratory pressure of 10 cm H_2O throughout the surgical procedure; and G-control ($n = 20$): not received any pre or intraoperative intervention. Following were recorded: time between induction of anesthesia and extubation, between the end of anesthesia and extubation, duration of mechanical ventilation, and time between extubation and discharge from the post-anesthetic recovery.
Results: There was no statistical difference between groups. However, when applied to the Cohen coefficient, the use of positive end-expiratory pressure of 10 cm H_2O during surgery showed a large effect on the time between the end of anesthesia and extubation. About this same time, the treatment performed preoperatively showed moderate effect.
Conclusion: The use of positive end-expiratory pressure of 10 cm H_2O in the intraoperative and positive pressure preoperatively, influenced the time of extubation of patients undergoing bariatric surgery.

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PALAVRAS-CHAVE
Doenças;
Obesidade;
Cirurgia bariátrica;
Ventilação mecânica: pressão positiva

Utilização da pressão positiva no pré e no intraoperatório de cirurgia bariátrica e seus efeitos sobre o tempo de extubação

Resumo
Justificativa e objetivo: Investigar a influência do uso da pressão positiva intraoperatória e pré-operatória no tempo de extubação de pacientes submetidos à cirurgia bariátrica.
Método: Trata-se de ensaio clínico randomizado, no qual 40 indivíduos com índice de massa corporal entre 40 e 55 kg/m^2, idade entre 25 e 55 anos, não tabagistas, submetidos à cirurgia bariátrica do tipo derivação gástrica em Y de Roux por laparotomia e com prova de função pulmonar pré-operatória dentro da normalidade foram randomizados nos seguintes grupos: G-pré (n = 10): indivíduos que receberam tratamento com pressão positiva não invasiva antes da cirurgia, durante uma hora, G-intra (n = 10): indivíduos que receberam Positive End-expiratory Pressure de 10 cm H_2O durante todo o procedimento cirúrgico e G-controle (n = 20): não receberam qualquer tipo de intervenção pré ou intraoperatória. Foram anotados os seguintes tempos: tempo decorrido entre a indução anestésica e a extubação, entre o término da anestesia e extubação, tempo de ventilação mecânica, e tempo entre a extubação e a alta da Recuperação Pós-Anestésica.
Resultados: Não houve diferença estatística entre os grupos, porém quando aplicado ao Coeficiente de Cohen, o uso da Positive End-expiratory Pressure de 10 cm H_2O no intraoperatório mostrou um efeito grande sobre o tempo entre o término da anestesia e a extubação. Sobre este mesmo tempo, o tratamento realizado no pré-operatório apresentou efeito moderado.
Conclusão: O uso da Positive End-expiratory Pressure de 10 cm H_2O no intraoperatório e da pressão positiva no pré-operatório, pode influenciar o tempo de extubação de pacientes submetidos à cirurgia bariátrica.

Introduction

Obesity is currently considered a public health problem that is reaching epidemic proportions.[1] In 2008, over 1.4 billion adults were overweight and, of these, over 200 million men and nearly 300 million women were obese.[1] Considered to be of multifactorial origin, the probable causes of obesity include a combination of genetic, endocrine, behavioral, socioeconomic, psychological, and environmental imbalances and, consequently, the emergence of multiple comorbidities.[2] Conservative treatment involves nutritional therapy, drug therapy, and physical activity. When conservative treatment is unsuccessful and obesity becomes morbid, the bariatric surgery is indicated.[3]

Most surgical procedures requiring general anesthesia may trigger the onset of postoperative complications, such as atelectasis, due to a decrease in functional residual capacity (FRC).[4] Moreover, the loss of abdominal muscle integrity due to the incision and the need for neuromuscular blockers, sedatives, and analgesics also interfere with muscle contractility, which in turn triggers the inadequate respiratory muscle performance after surgery.[5]

These effects of general anesthesia when associated with morbid obesity may further worsen the development of intraoperative and postoperative complications.[6] Thus, the longer the duration of surgery, and consequently the anesthetic procedure, the greater the chances of postoperative pulmonary complications.[7]

Respiratory physiotherapy with re-expansion techniques has proven benefits in reducing complications after abdominal surgery,[8] but there are no well-designed clinical trials in the literature to prove that there is superiority between the proposed treatment forms for the preoperative, intraoperative and post-operative periods of abdominal surgery.

Literature on the use of noninvasive mechanical ventilation postoperatively is vast and shows good results.[9–11] Some ventilatory strategies have been used postoperatively in an attempt to improve gas exchange through the use of positive pressure maneuvers aiming at alveolar recruitment and even reducing the surgical time.[12,13] However, the literature on the use of positive pressure preoperatively as a prophylactic manner is still scarce.

Thus, the hypothesis of the study was that positive pressure applied during both pre- and intraoperative periods may influence the extubation time of patients undergoing bariatric surgery.

Therefore, the aim of this study was to investigate the influence of intraoperative 10 cm H_2O positive end-expiratory pressure (PEEP) and preoperative positive pressure on extubation time of patients undergoing Roux-en-Y gastric bypass bariatric surgery.

Method

Study design

Randomized clinical trial approved by the Ethics Research Committee, Universidade Metodista de Piracicaba (UNIMEP),