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Official Publication of the Brazilian Society of Anesthesiology
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SCIENTIFIC ARTICLE

Analysis of the prevalence of atelectasis in patients undergoing bariatric surgery[☆]

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Received 14 April 2014; accepted 26 November 2014

KEYWORDS

Obesity;
Morbid;
Bariatric surgery;
Pulmonary
atelectasis;
Physiotherapy
specialty

Abstract

Background and objective: To observe the prevalence of atelectasis in patients undergoing bariatric surgery and the influence of the body mass index (BMI), gender and age on the prevalence of atelectasis.

Method: Retrospective study of 407 patients and reports on chest X-rays carried out before and after bariatric surgery over a period of 14 months. Only patients who underwent bariatric surgery by laparotomy were included.

Results: There was an overall prevalence of 37.84% of atelectasis, with the highest prevalence in the lung bases and with greater prevalence in women (RR = 1.48). There was a ratio of 30% for the influence of age for individuals under the age of 36, and of 45% for those older than 36 (RR = 0.68). There was no significant influence of BMI on the prevalence of atelectasis.

Conclusion: The prevalence of atelectasis in bariatric surgery is 37% and the main risk factors are being female and aged over 36 years.

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<http://dx.doi.org/10.1016/j.bjane.2014.11.016>

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Please cite this article in press as: Baltieri L, et al. Analysis of the prevalence of atelectasis in patients undergoing bariatric surgery. Rev Bras Anesthesiol. 2015. <http://dx.doi.org/10.1016/j.bjane.2014.11.016>

PALAVRAS-CHAVE

Obesidade;
Mórbida;
Cirurgia bariátrica;
Atelectasia
pulmonar;
Especialidade em
Fisioterapia

Análise da prevalência de atelectasia em pacientes submetidos à cirurgia bariátrica

Resumo

Justificativa e objetivo: Observar a prevalência de atelectasia em pacientes submetidos à cirurgia bariátrica e a influência do índice de massa corporal (IMC), sexo e idade sobre a prevalência de atelectasia.

Método: Estudo retrospectivo de 407 pacientes e laudos de radiografias de tórax realizadas antes e após a cirurgia bariátrica durante um período de 14 meses. Apenas os pacientes submetidos à cirurgia bariátrica por laparotomia foram incluídos.

Resultados: Houve uma prevalência geral de atelectasia de 37,84%, com maior prevalência nas bases pulmonares e em mulheres (RR = 1,48). Houve uma proporção de 30% para a influência da idade nos indivíduos com idade inferior a 36 anos e de 45% naqueles com idade superior a 36 anos (RR = 0,68). Não houve influência significativa do IMC sobre a prevalência de atelectasia.

Conclusão: A prevalência de atelectasia em cirurgia bariátrica é de 37%, e os principais fatores de risco são sexo feminino e idade superior a 36 anos.

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Introduction

Obesity has reached epidemic proportions, and in 2008 over 1.4 billion adults were overweight.^{1,2} In addition to the comorbidities that accompany obese subjects, some changes in the respiratory system and lung function can also be found, due to the accumulation of fat around the ribs, diaphragm and abdomen, thus limiting movement of the rib cage.³

Obesity is a chronic disease,^{3,4} and bariatric surgery is indicated for patients who do not respond to conservative treatment.⁴

In a study by Chung et al.⁵ it was shown that obesity is a forerunner for the appearance of intra and post-operative respiratory complications during or after surgery. Since gastroplasty, one of the bariatric surgery techniques, is upper abdominal surgery, it presents changes inherent to this procedure, such as reduced lung volumes, increased respiratory rate and respiratory muscle dysfunction.⁶ The appearance of atelectasis is frequent amongst all types of patient during general anesthesia.^{7,8} On submitting patients to elective upper abdominal surgery, Pereira et al.⁹ found a 32% incidence of pulmonary complications in patients who presented the restrictive pulmonary syndrome, as compared to 6% of complications in patients without respiratory co-morbidities. Atelectasis appeared in 34% of the whole sample.

The situation is worse in obese patients in whom atelectasis may appear and persist for up to 24 h after extubation, which does not occur in non-obese patients.¹⁰ Moreover, even during the surgical procedure, handling the abdominal cavity results in diaphragmatic elevation and further increases the possibility of atelectasis.¹¹

According to Martí-Valeri et al.,¹² who studied patients suffering from obstructive apnea sleep syndrome (OASS), a prevalence of 17% of atelectasis was diagnosed by chest radiography after bariatric surgery.

However, there is a lack of data in the literature concerning the prevalence of atelectasias after bariatric surgery,

even though it is known that this could constitute one of the causes of pulmonary dysfunction and respiratory failure in these patients.

To recognize and identify postoperative respiratory complications after upper abdominal surgery could contribute to the development of preventive strategies.

The hypothesis of this study is that patients with morbid obesity who undergo surgery may have a higher index of atelectasis due to increased abdominal fat and the need for general anesthesia.

The aim of this study was to observe the prevalence of atelectasis in obese and morbidly obese patients who undergo gastroplasty using the Roux-Y Gastric Bypass technique (RYGB) by laparotomy, evaluating the chest X-rays 48 h after surgery, and also observing any influence of the BMI, gender or age on the prevalence of atelectasis.

Methods

The study followed ethical guidelines and was approved by the Ethics Committee of the Methodist University of Piracicaba, SP, Brazil (protocol number 09/08). This is a retrospective study in which chest X-ray reports made after bariatric surgery were analyzed at the moment of hospital discharge (48 h after surgery). Data were collected for a period of 14 months. The reports were collected from the medical records of patients who had undergone bariatric surgery.

Only patients submitted to RYGB-type bariatric surgery by laparotomy, with a BMI above 35 kg/m², no pulmonary symptoms or lung disease, normal pulmonary function test and normal preoperative chest X-ray, were included. All patients were submitted to the pulmonary function test and had a chest X-ray, but no lung diseases were identified. Dyspnea was not considered as a respiratory co-morbidity, since it is common in patients with morbid obesity.

Patients were excluded if they suffered from OASS or asthma, or showed any surgical (fistulas, bleeding, etc.) or clinical complications that could interfere with the length

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