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THE EFFECT OF PREOPERATIVE INCENTIVE SPIROMETRY WITH PATIENT EDUCATION ON POSTOPERATIVE COMPLICATIONS IN BARIATRIC SURGERY PATIENTS: A RETROSPECTIVE CHART REVIEW

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ABSTRACT

Research Question: Will bariatric surgery patients receiving pre-operative Incentive Spirometry (POISE) education at PST have less post-operative respiratory complications than bariatric surgery patients that did not receive pre-operative IS education. **Background information/Significance**: The prevalence of morbid obesity and metabolic disease have increased in the US over the past decade. As a result bariatric surgery rates have increased. While bariatric surgery is an effective and safe procedure with mortality becoming increasingly rare, complications can occur .Respiratory complications are the leading cause of morbidity and mortality following major abdominal surgery and patients who undergo bariatric surgery are particularly at risk as intrathoracic and abdominal fat can restrict lung expansion and decrease reserve volumes. Incentive spirometry (IS) devices are provided to surgical patients postoperatively to facilitate effective inspiration while offering visual feedback in terms of inspired flow and volume. These devices are designed to mimic natural signing and yawning by encouraging the patient to take long deep breaths. While the use of IS devices has gained popularity several systematic reviews including a recent analysis conducted by the Cochrane group found that the effectiveness of IS was inconsistent .Since this review a greater emphasis has been placed on patient education and use of IS. **Research design**: Retrospective chart review of patients undergoing bariatric surgery between May 2014–August 2016, ACE star model of knowledge transformation. **Results:** Data for 322 patients receiving IS with and without POISE (194 vs 128) undergoing laparoscopic vertical sleeve gastrectomy with or without lap-band removal was collected. While groups were similar with respect to demographics (age, gender and BMI) and characteristics such as ASA physical status, current smoking, OSA and other respiratory comorbidities, POISE+ group had a higher incidence of COPD (14.95% vs 4.69%, p=0.004). With respect to outcomes 5.15% (n=10) of patients in [POISE+] experienced respiratory complications vs 2.34% (n=3), p=0.21 in [POISE-] group. A composite outcome of respiratory, thromboembolic, bleeding complications and readmissions occurred in 9.79% (n=19) of [POISE+] patients vs 6.25% in [POISE-] patients, p=0.26. **Conclusion/Implication for practice:** Our data shows that spirometry patient education is not associated with significantly reduced respiratory complications. However given our limited sample size, the observational nature of the study and higher number of COPD patients in the education group it is difficult to draw definitive conclusions from our data. We propose to perform a randomized trial to ensure more balanced distribution of pre-existing comorbidities allowing for a more rigorous evaluation of the efficacy of spirometry education.

KEYWORDS: Intrathoracic, Incentive spirometry (IS).

INTRODUCTION

As the prevalence of morbid obesity has increased, so has the use of bariatric surgery.[1] While bariatric surgery is an effective and safe procedure with mortality becoming increasingly rare, complications can occur.[2] Respiratory complications are the leading cause of morbidity and mortality following major abdominal surgery and patients who undergo bariatric surgery are

particularly at risk as intrathoracic and abdominal fat can restrict lung expansion and decrease reserve volumes.[3]

Incentive spirometry (**IS**) devices are provided to surgical patients postoperatively to facilitate effective inspiration while offering visual feedback in terms of inspired flow and volume. These devices are designed to mimic natural sighing and yawning by encouraging the patient to take long deep breaths. While the use of **IS** devices has gained popularity several systematic reviews including a recent analysis conducted by the Cochrane group found that the effectiveness of IS was inconsistent.[4] Since this review a greater emphasis has been placed on patient education and use of IS. Since April 2015, bariatric surgery patients attending pre-surgical testing at North Shore University hospital have been receiving **IS** devices and pre-operative education in their use up to 2 weeks before their procedure. We propose to compare this cohort to historic controls who receive **IS** devices postoperatively with no education respect to postoperative respiratory and other complications.

OBJECTIVE

We propose to compare the efficacy of preoperative incentive spirometry education (**POISE**) and postoperative **IS** to postoperative **IS** alone in the prevention of pulmonary and other complications in bariatric patients at NSUH.

METHODS

A retrospective review of consecutive medical records of adult patients undergoing bariatric surgery from May 2014 to August 2016 at NSUH was conducted. Descriptive statistics, means (95% CI) medians (IQR) and percentages (n), were used to describe patient demographics, clinical characteristics, complications and composite outcome. For comparisons between the two groups when parametric methods are described normality was confirmed. Independent sample t-tests were used to assess statistical differences between both groups for continuous variables and chi square test was to determine statistical differences between groups for categorical variables such as the occurrence of postoperative pulmonary and other complications. Statistical analyzes was performed using SAS software (SAS Institute Inc., Cary, NC).

RESULTS

To date data for 143 patients receiving **IS** and **POISE** undergoing laparoscopic vertical sleeve gastrectomy with or without lap-band removal has been collected. The majority of patients were female (73.8%, n=104) with 71.56% (n=98) classified as ASA physical status of 3 or above. Median age was 42 (IQR 35-53) and median BMI was 43.4 (IQR 39.35 to 49.3). With respect to preoperative comorbidities 4.26% (n=34) of patients had a history of respiratory problems, 13% (n=17) were diagnosed with chronic obstructive pulmonary disease (COPD) and 51.2% (n=64) had a history of hypertension. With respect to outcomes 7.14% (n=10) of patients experienced respiratory complications such as obstructive sleep apnea and a composite of respiratory, thromboembolic and readmissions occurred in 9.9% (n=14) of patients.

CONCLUSION/FUTURE WORK

Future work will comprise additional data collection for patients who receive Incentive spirometry without preoperative incentive spirometry education.