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What is the true incidence of adverse events following surgical resection for esophageal and gastric cancer?

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Objective

Our objective was to document the incidence of adverse events (AEs) following major foregut surgery for esophageal and gastric cancer reported in prospective and retrospective literature and compare it to the prospectively collected data from The Ottawa Hospital's Division of Thoracic Surgery, Thoracic Morbidity and Mortality (TM&M) classification system database (www.ottawatmm.org), and establish the true rate of AEs.

Introduction

The true incidence of post-operative AEs from major foregut surgery for esophageal and gastric cancer remains controversial and poorly defined. Our aim was to determine the true rate of AEs following major foregut surgery for esophageal and gastric cancer. By comparing prospectively collected institutional morbidity and mortality rates with literature averages, we can determine discrepancies between retrospective and prospective AE reporting.

Methods

Data from all esophagectomy (n=165) and gastrectomy (n=96) surgeries completed between 01/2008-12/2014 were retrieved from The Ottawa Hospital's Thoracic Morbidity and Mortality classification system database; a prospective, standardized, and objective system for reporting and monitoring post-operative AEs and their severity. Surgical volume, morbidity and mortality rates for esophagectomy and gastrectomy surgeries were analyzed in this REB approved project. A literature review of 32 journals from 2000-2014 for esophagectomy and gastrectomy surgeries was conducted, and average literature morbidity and mortality rates were calculated and compared for statistical significance using Chi-square analysis.

Discussion

The discrepancy in AE rates can possibly be explained by our institution's prospective documentation of all complications and a broader definition of major complication. There is no standard system for classifying complications which makes the comparison of complication rates less accurate [1]. Our institution defines complications following the Clavien-Dindo system [1] and considers grades 1-2 minor complications, and grades 3a-5 major complications. Most literature articles consider only major complications in their definition of a complication. Only three articles [2,3,4] reviewed include minor grade 1 complications in their complication rate. Standardized complication classification allows for a more accurate comparison of complication rates. Our institution's definition of a major complication includes using pigtail catheter for a pleural effusion a grade 3a, while none of the reviewed literature includes the use of a pigtail as a complication. Five [2,5,6,7,8] of the 32 reviewed journals include pleural effusion as a complication.

Results

The Thoracic Morbidity and Mortality system identified statistically significant differences in esophagectomy surgery complication rates compared to prospective and retrospective literature averages. There were no statistical differences between the prospective and retrospective complication rates for gastrectomy surgery.

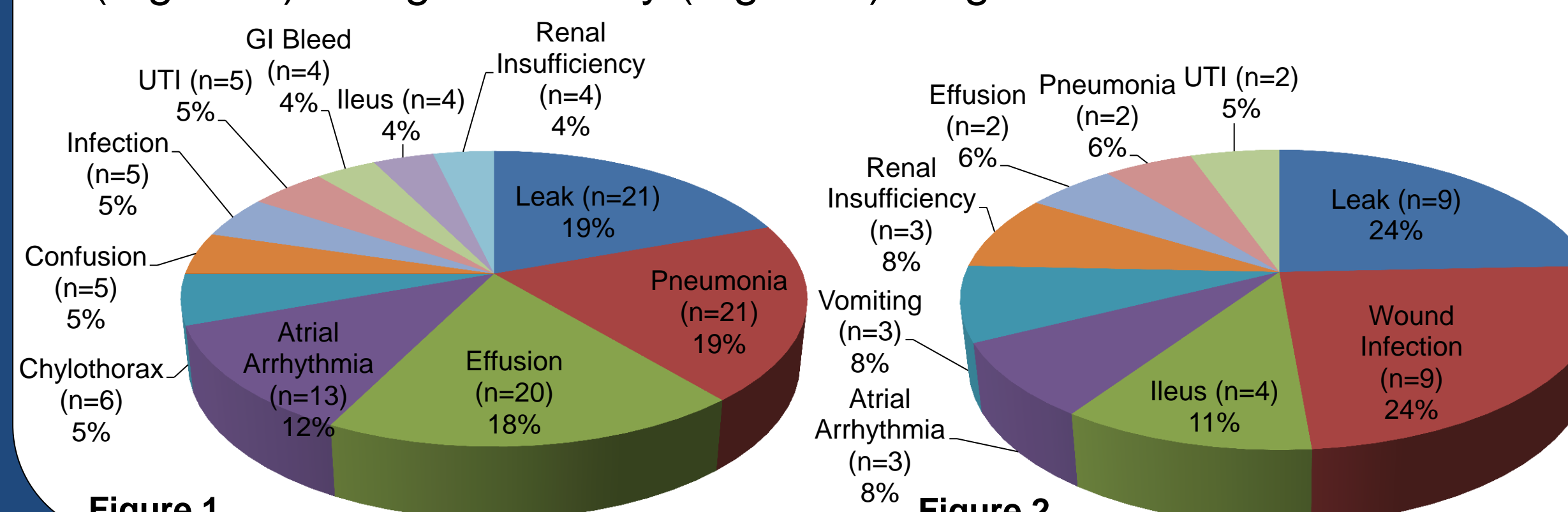
Table #1. Literary review table for esophagectomy and gastrectomy surgical data from 2000 to 2015

Table with 10 columns: Leading Author, Year Published, No. Patients Reviewed, Complication Reporting, Complication Rate, Minor Complication Rate, Major Complication Rate, Mortality Rate, Length of Follow up (day), Center. It is divided into Esophagectomy Retrospective Literature, Esophagectomy Prospective Literature, and Gastrectomy Retrospective Literature.

Table #2. Comparing prospectively and retrospectively collected post-operative adverse events for esophagectomy and gastrectomy surgeries. P-values compare institutional rates of adverse events to literature averages.

Summary table comparing overall, minor, major complication rates and mortality rates for esophagectomy and gastrectomy across retrospective literature, prospective literature, and TM&M data.

Figures #1-2. Most prevalent complications from esophagectomy (Figure 1) and gastrectomy (Figure 2) surgeries.



Conclusions

Prospectively recorded adverse events provide a more accurate representation of the true rate of post-operative adverse event following major foregut surgery for esophageal and gastric cancer. Standardized and prospectively recorded adverse events are critical to provide an accurate representation of complication rates that can be expected by surgeons and patients, help benchmark performance, and be useful for inter-institutional comparison and continuous self-evaluation.

Figure #3. Comparing retrospectively and prospectively collected adverse event rates for esophagectomy surgery. Standard deviations for literature morbidity and mortality rates are shown and data marked with an asterisk (*) are statistically different from TM&M data.

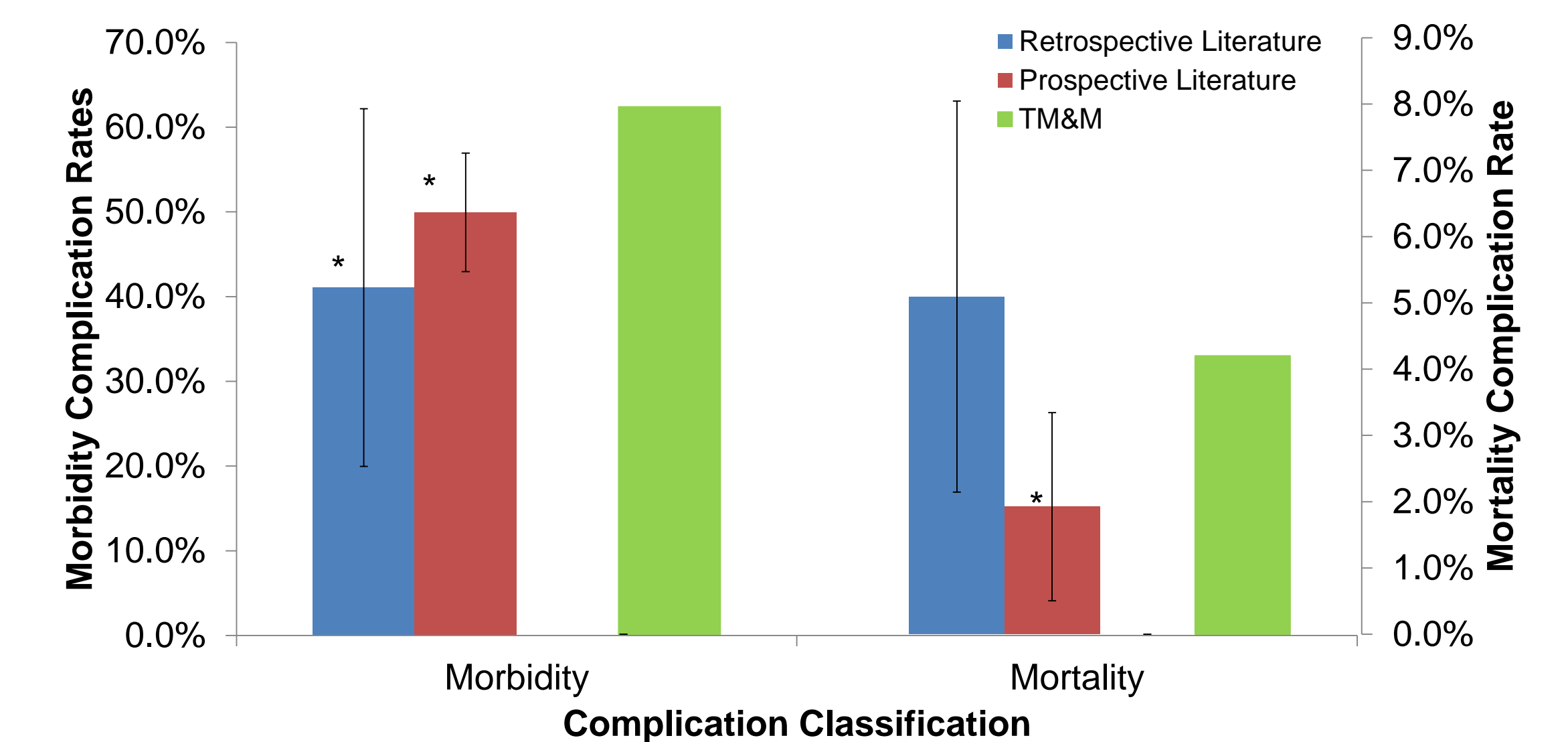
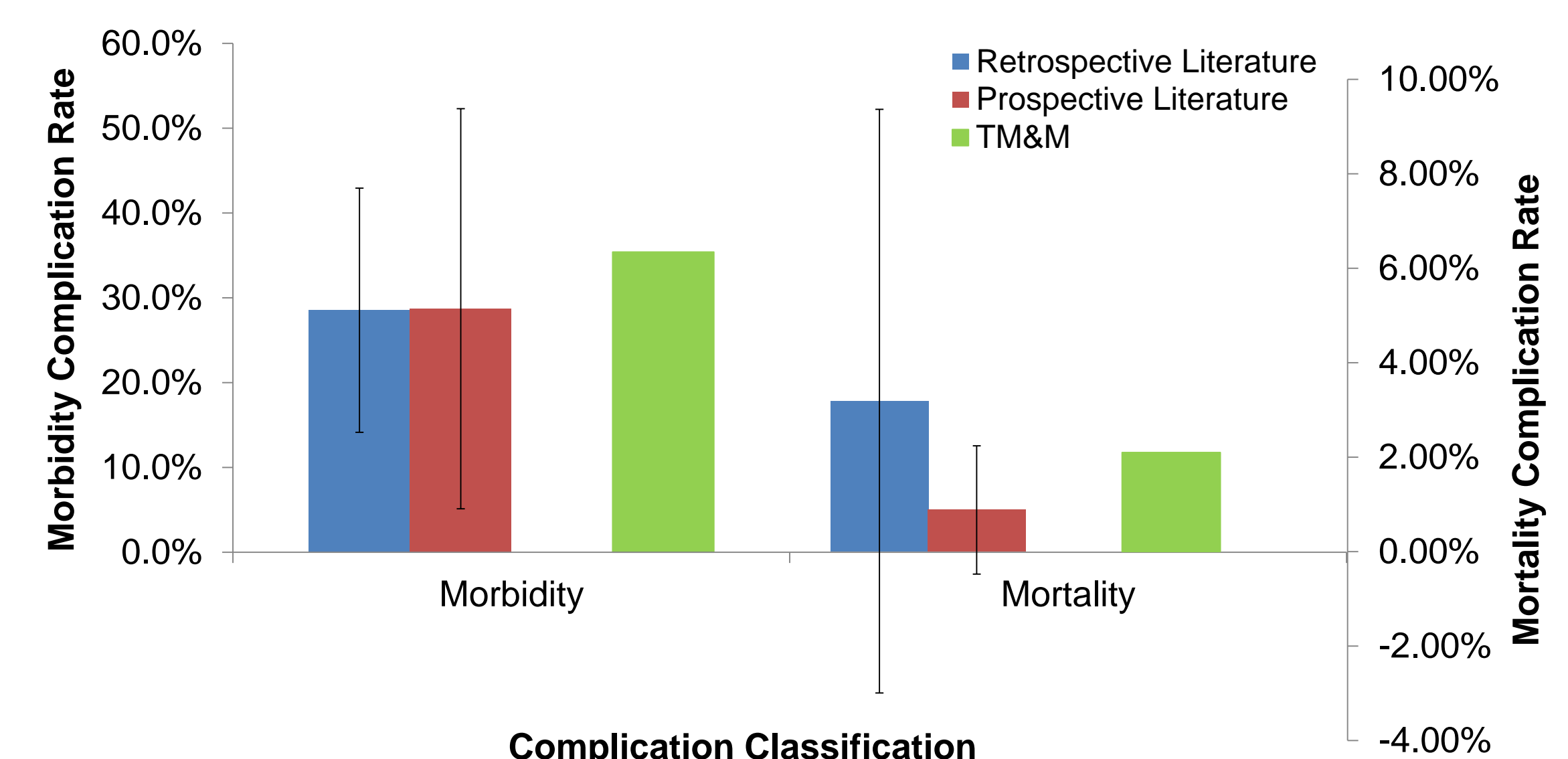


Figure #4. Comparing retrospectively and prospectively collected adverse event rates for gastrectomy surgery. Standard deviations for literature morbidity and mortality rates are shown.



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Acknowledgements

Thank you to the University of Ottawa, The Ottawa Hospital, The Ottawa Hospital Research Institute (OHRI), and The Ottawa Hospital's Division of Thoracic Surgery

