Incidence of Gastroparesis Following Orthotopic Lung Transplant

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Background

- Gastrointestinal motility is tightly regulated by the autonomic and central nervous system, which in turn synchronizes the motor and sensory functions of the enteric nervous system.
- Gastroparesis, also known as delayed gastric emptying (DGE), can result from the malfunction of this process, and is a symptom of foregut dysmotility.
- The gold standard for diagnosis of gastroparesis is a nuclear medicine solid-phase gastric emptying study.
- Studies have found that lung transplant recipients can develop gastroparesis approximately 10% of the time.
- Further studies indicate a correlation with gastroparesis and chronic lung allograft dysfunction and micro-aspiration.
- This led to patients developing bronchiolitis obliterans syndrome (BOS).
- BOS stands as a leading cause of late morbidity and mortality in lung transplant recipients, with an incidence of 50% at 5 years post-transplant.

Treatment Options

- First line: Promotility medications
  - Metoclopramide or prucalopride
- Botulinum-A Injections to the pylorus
  - Temporization of gastroparesis, but not long-term cure.
- Endoscopic Approach: Gastric per-oral endoscopic myotomy
  - Myotomy of the pylorus to improve gastric emptying
- Surgical
  - Pyloroplasty
  - Roux-en-Y Gastrojejunostomy
  - Partial Gastrectomy
  - Total Gastrectomy

Objective

- The primary objective of this study is to investigate the incidence and risk factors associated with gastroparesis (delayed gastric emptying) post-surgery in patients subjected to orthotopic lung transplant at AdventHealth Orlando.

Methods

- Retrospective study investigating the incidence and associated risk factors of gastroparesis following lung transplant between January 1, 2011, and January 1, 2021.
- Summary statistics for categorical variables will be frequency and percentages.
- Numerical summary will be mean with standard deviation for normally distributed variables and median with interquartile range for all other values.
- Incidence will be a point estimate and a 95% confidence interval. Individual risk factors may be tested with Chi-square, ANOVA or non-parametric testing as indicated.

Results

- There were 124 patients in this study.
- Of 124 patients, 65% (n=80) males, and 35% females. The mean age was 57, with an age range from 18 to 81.
- There were 71 former smokers, and 53 non-smokers.
- 6 patients had a pre-operative history of gastroparesis ,and 71 were subsequently diagnosed with gastroparesis post-operatively.
- No significant association between each demographic variable and Prior/Post Gastroparesis, respectively.
- Previous surgery had a significant relationship with Post-Gastroparesis with p-value 0.011. The results showed that all other medical conditions had no significant associations with Prior and Post-Gastroparesis.
- We found that Prior-EGD, Prior-UGI, Prior-EGD and Post-EGD had the significant associations with Post transplant Gastroparesis (P-values of 0.027, <0.001, <0.001, 0.038 and <0.001, respectively).
- Patients with diabetes have 6.19 times more chances to have gastroparesis compared to those without diabetes with the same conditions.
- The factors of Age, Diabetes, Prior Surgery, Prior-UGI and Prior-Gastroparesis were found as important risk factors with p-values of 0.070, 0.017, 0.038, <0.0001 and <0.001, respectively.

Discussion

- Foregut dysmotility is a known complication of lung transplant as multiple studies have shown a correlation between lung transplantation and post-operative gastroparesis.
- Pathogenesis of gastroparesis post lung transplant is unknown, but it is thought to be multifactorial in nature. Possibly due to vagal nerve injury or dysfunction, or to the toxicity of immunosuppressive medication.
- Factors associated with an increased risk of gastroparesis include history of diabetes, prior abdominal surgery, and prior gastrointestinal investigations without a pre-operative diagnosis of gastroparesis.

Conclusions

- We found a higher incidence of gastroparesis in patients with diabetes, prior surgical interventions, and prior GI investigation.
- This information may open the door to further avenues of prospective research, such as evaluating the role for prophylactic gastric emptying interventions, particularly to prevent the possible risks to a transplanted organ such as the lungs.
- A transplant is a precious gift, it warrants the research to try and protect prospective patients with the best possible evidence to reduce morbidity and mortality.

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