



Physicians Caring for Texans

TexMed 2017 Clinical Abstract

Please complete all of the following sections and include supporting charts and graphs in this document. Submit a total of two documents - this document and the Biographical Data and Disclosure Form to posters@texmed.org by midnight March 17, 2017.

Procedure and Selection Criteria

- Submissions not directly related to quality improvement or research may be accepted and should follow the standardized format outlined below. Content should enhance knowledge in the field of clinical care and be relevant to a given patient population.

PROJECT NAME: Retrospective chart review of kidney transplant patients and hyperglycemia

Institution or Practice Name: University of Texas at Houston McGovern Medical School

Setting of Care: Memorial Hermann Hospital

Primary Author: Emily Dewar

Secondary Author: Srikanth Sridhar, Evan Pivalizza

Other Members of Project Team:

Is the Primary Author, Secondary Author or Member of Project Team a TMA member (required)?

Yes No

Please provide name(s) and their role in the project:

TMA Member Name: Emily Dewar, primary author
Evan Pivalizza, secondary author

TexMed Poster Session Specialty Subject Area: Please check if these apply.

Enhanced Perioperative Recovery

Disaster Medicine and Emergency Preparedness

Clinical

Background (15 points max):

Hyperglycemia can be a clinical management problem following renal transplantation. Approximately 23% of patients receiving a kidney transplant have end-stage renal disease (ESRD) due to complications from diabetes mellitus, and are at an increased risk for postoperative hyperglycemia³. Hyperglycemia in transplant patients is complicated by the need for corticosteroid immunosuppressive therapy, which has been shown to contribute to the condition by increasing gluconeogenesis and insulin resistance. In addition, impaired or fluctuating renal function after transplant may make maintaining glycemic levels in these patients difficult¹. The effects of hyperglycemia in kidney transplant patients can be immediate or long-term. Inpatient hyperglycemia immediately following transplant surgery has been shown to increase the incidence of wound infection, while long term inpatient hyperglycemia may affect both graft and patient outcomes². Perioperative glycemic control has been shown in some studies to independently predict acute graft rejection in diabetic patients^{4;5}, and better understanding what factors impact this control could lead to improvement of patient care and overall outcomes in kidney transplant patients.

Intended Stakeholders (15 points max):

Each year, approximately 16,000 patients receive kidney transplants in the United States alone. This study could benefit not only these patients, but also the physicians and health practitioners that deliver their pre-, post-, and perioperative care.

Description of Accomplished Work (25 points max):

Due to the need to identify several groups, including patients with type 1 or 2 diabetes, those without diabetes, those with intraoperative hyperglycemia, and those receiving intraoperative insulin/dextrose treatment, groups of sufficient size would be required to afford statistical validity. Given that 80-100 kidney transplants are performed annually at Memorial Hermann Hospital, we retrospectively evaluated three years of transplants to meet the above criteria. Once groups were identified, appropriate non-parametric analysis was performed on group composition in Excel, with the anticipation of unequal group sizes. Correlation was sought between intraoperative glucose findings and postoperative hyperglycemia, with the use of appropriate tests to validate findings.

After analysis, we found that patients with diabetes mellitus (DM) had pre-operative hyperglycemia 27.1% of the time, while patients without DM (non-DM) only had pre-operative hyperglycemia 5% of the time. The mean pre-operative blood glucose level in DM patients was significantly higher than that of non-DM patients ($p=0.002$). In addition, DM patients had post-operative hyperglycemia 85.4% of the time, while non-DM patients only had post-operative hyperglycemia 46.5% of the time. The mean post-operative blood glucose level in DM patients was significantly higher than that of non-DM patients ($p=4.7E-6$). This suggests that DM is a direct risk factor for hyperglycemia in renal transplant patients. There was no significant difference in average post-operative blood glucose level in DM patients who received post-operative dextrose versus those who did not, nor was there a significant difference in post-operative blood glucose level between non-DM patients who received post-operative dextrose versus those who did not. In addition, there was no significant difference in average post-operative blood glucose level in DM patients who received post-operative insulin versus those who did not, nor was there a significant difference in post-operative blood glucose level in non-DM patients who received post-operative dextrose versus those who did not. This suggests that post-operative dextrose and insulin did not have a significant effect on post-operative blood glucose level.

The following figures are included in the addendum:

Figure 1. Proportion of diabetic KT patients showing both pre- and post-operative hyperglycemia, no hyperglycemia, pre-operative hyperglycemia only, and post-operative hyperglycemia only

Figure 2. Mean post-operative blood glucose (mg/dL) in patients receiving or not receiving insulin following KT, as seen in diabetics compared to non-diabetics.

Figure 3. Mean post-operative blood glucose (mg/dL) in patients receiving or not receiving dextrose following KT, as seen in diabetics compared to non-diabetics.

Figure 4. Percentage of patients showing pre-operative hyperglycemia and post-operative hyperglycemia among diabetic and non-diabetic patients.

Timeframe and Budget (20 points max):

This project was initiated on May 28th, 2016, and was concluded on August 15th, 2016. No expenses were incurred during this project.

Intended Use (25 points max):

With further analysis, we hope to find more correlations between peri-operative factors and renal transplant patient post-operative blood glucose level. This study reinforces that physiological responses to surgery are extensive and nuanced, and further research is needed to improve patient and graft outcomes.