

Data Studio

1:30–3:00pm, Wednesday, 5 January 2022

Videoconference: <https://stanford.zoom.us/j/92300593799?pwd=aXNHSUtQcFVmSEs5SVR2N3FRNmMx3Zz09>

Password: 909614

Investigator: Alana O'Mara (1)

Investigator: Michael J. Gardner (1)

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Title: Lower Extremity Orthopaedic Surgical Outcomes in Diabetic Females

Summary:

The Data Studio Workshop brings together a biomedical investigator with a group of experts for an in-depth session to solicit advice about statistical and study design issues that arise while planning or conducting a research project. This week, the investigator(s) will discuss the following project with the group.

Diabetes is an increasingly common disease in the United States, affecting around 13% of US adults. Diabetes can have systemic effects that impair bone mineral density such as increased release of cortisol and diabetic nephropathy which can lead to renal osteodystrophy. Furthermore, certain drugs commonly used in conjunction with diabetes can impact the skeleton. Thus, many diabetics have increased fracture risk. Moreover, post-operative surgery leads to derangements that can further exacerbate insulin resistance and lead to hyperglycemia which can lead to a relative immunodeficiency. Consequently, diabetics are more likely to experience post-operative adverse events. Very few studies have looked at the factors that play a role in 30-day postoperative outcomes for the study population of interest: female diabetics up to age 50 who have undergone lower extremity orthopaedic operations.

This study has two aims. The first aim is to compare the distribution of factors between two groups of female orthopaedic patients up to age 50 undergoing lower extremity surgeries: diabetics versus non-diabetics. The second aim is to determine which factors mentioned above play a role in post-operative outcomes and quantify the amount they may affect outcomes between those with and without diabetes. This study uses data from a large national surgical database that collects patient demographics, comorbidities, and 30-day postoperative outcomes. There are a total of 10,014 female subjects up to age 50 with lower extremity fractures. The specific factors of interest include: age, race, ethnicity, electiveness of surgery, fracture type, weight, history of COPD, use of medications, hypertension, congestive heart failure, dialysis, current cancer, race, smoking status, diagnosis of bleeding disorder, and transfusion before surgery. These factors are coded as either dichotomous (having disease or not), categorical (BMI, race, ethnicity), or continuous (weight and age). Postoperative outcomes we will consider include both continuous (length of hospital stay, days to death, days to unplanned reoperation or admission) and dichotomous (occurrence of superficial infection, occurrence of deep infection, occurrence of wound disruptions, occurrence of pneumonia, occurrence of intubation, occurrence of pulmonary embolism, occurrences of on ventilator, occurrence of renal insufficiency, occurrence of acute renal failure, occurrence of UTI, occurrence of stroke, occurrence of DVT, occurrence of MI, occurrence of sepsis, occurrence of death, unplanned reoperation or readmission).

Questions:

We need help with data analysis for this project.

1. Which factors are significantly different between diabetics and non-diabetics?
2. Which factors affect post-operative outcomes?
3. What are recommended descriptive analyses of the prevalence of the various factors between diabetics and non-diabetics?
4. How should we compare risk factors? For example, chi-squared for categorical vs linear modeling for age.
5. Factors to consider as covariates that may affect the post-surgical outcomes
 - (a) Does diabetes or congestive heart failure play a larger role in post-surgical outcomes?
 - (b) Is there a synergistic effect between having diabetes and another factor (ie congestive heart failure) on post-surgical outcomes, or do the two act separately?

Zoom Meeting Information

Join from PC, Mac, Linux, iOS or Android:

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For more information about Data Studio:

<http://med.stanford.edu/dbds/resources/data-studio.html>