Perioperative pregabalin as part of a multimodal treatment plan for pain after ureteroscopy with stent placement: a randomized, controlled trial

Statistical analysis plan

Version 1.0
Version date: February 27, 2020

Statistical Analysis Plan

Enrolled subjects' characteristics will be summarized using mean ± SD for continuous variables and proportions for categorical variables. The primary outcome of interest, the value on the visual analog scale of pain score (VAS score), will be summarized overall and by treatment group, those who received perioperative pregabalin and those who received placebo. To examine the research question, an independent sample t-test will be conducted to assess if differences exist on VAS scores by the treatment group. The assumptions of normality and homogeneity of variance will be assessed. Normality of the scores will be assessed using the One-Sample Kolmogorov-Smirnov test. Homogeneity of variance will be assessed using Levene's Test for the Equality of Error Variances. The *t*-test will be two- tailed with the probability of rejecting the null hypothesis when it is true set at $p < 0.05$. If groups are unbalanced with respect to one or more patients' characteristics, we will perform a stratified analysis of VAS scores based on that characteristics.
For the secondary outcomes of interest, a two sample t-test or a Chi-square test of independency will be used to compare the treatment groups for continuous and categorical outcomes, respectively.
In addition to univariate analysis, we will fit a generalized linear model or logistic regression model of outcome on treatment group controlling for possible confounding variables such as, gender, age, pre-operation VAS score and pre-operation Watson clock drawing score, depending on type of outcome.

Power Analysis

Group sample sizes of 59 per group achieve 80% power to reject the null hypothesis of equal means when the population mean difference in VAS score is as little as 1 unit, assuming the standard deviations of 1 for group 1 (based on our pilot study) and 2.5 for group 2 (from literature), and with a significance level (alpha) of 0.05 using a two-sided two-sample unequal-variance t-test. Assumption about 40% dropout rate, it requires approximately 200 total subjects with a planned 1:1 placebo to active treatment enrollment ratio. We estimate at least 500 eligible procedures are conducted each year at our institution. Accounting for excluded patients and those who do not wish to participate, we estimate that full enrollment should be attainable within one year.