220P-2013

Propensity Score-based Analysis of Short-Term Complications in Patients with Lumbar Discectomy in the ACS-NSQIP Database

Yubo Gao, Ph.D, Department of Orthopaedic Surgery & Rehabilitation, The University of Iowa

INTRODUCTION

- Lumbar discectomy can be done on outpatient or inpatient basis with varied benefits.
- There is no large study comparing the incidence of complications between inpatient and outpatient undergoing discectomy.

PURPOSE

- To compare the incidence of complications in patients undergoing discectomy between the inpatient and outpatient settings.
- To determine baseline 30-day complication rates, and
- To identify independent risk factors for complications.

MATERIALS & METHODS

- Patients were identified from the ACS NSQIP database from 2005 to 2010 using CPT code 63030. Total 4310 cases.

Explanatory/Control variables

- Patient demographics: age, sex, and race
- Preoperative variables: BMI, recent weight loss, diabetes, and *et al*
- Preoperative comorbidities: coronary artery disease, and *et al*.
- Operative variables: wound class, ASA class, and *et al*.

Outcomes

30-day complications after spine surgery include

- wound complications
- pulmonary complication
- hematologic complication
- cardiac complication
- renal complication
- neurologic complication
- And others

Statistical analysis

Unadjusted univariate comparison

- Proc ttest
- Proc freq

Propensity score_based model to reduce selection bias

- matching
- regression

SAS CODES

Propensity scores

```
proc logistic data=pgy2 descending;
      class sex new_race wtloss diabetes1 dialysis
            wndinf proper30 wndclas  asaclas;
      model inout2=sex new_race wtloss diabetes1
                        dialysis wndinf proper30
                        wndclas asaclas age1 bmi
                        prwbc prhct optime rbc/lackfit
                          risklimits;
      output out=propensity_scores pred=prob_inout;
run;
quit;
```

Evaluation of common support

```
proc univariate data=propensity_scores noprint;
      class inout2;
      histogram  prob_inout;
      inset N='N' (6.0)
      Mean='Mean' (4.2)  STD='STD' (4.2)/font='Arial'
      pos=ne height=3;
run;
```

Dividing propensity score into 5 groups

```
proc rank groups=5 data=propensity_scores out=r;
      ranks rnks;
      var prob_inout;
run;
data a;
      set r;
      quintile=rnks+1;
Run;
```

Regression

```
proc logistic data=a descending;
      class inout2;
      model complication= inout2 quintile/lackfit risklimits;
run;
quit;

proc glm data=a;
      class inout2 ;
      model continuous_variables=inout2 quintile/ss3 solution;
      lsmeans inout2/adjust=tukey pdiff cl;
quit;
```

Matching by Hash

```
data outpatients0(rename=(prob_inout=pscoreT))
    inpatients0(rename=(prob_inout=pscoreC));
    set a;
    if prob_inout=. then delete;
    RandomNumber= ranuni(2011);
    if inout2=0 then output outpatients0;     /*Treatment*/
    else if inout2=1 then output inpatients0; /*Control*/
run;
data outpatients0; /*Treatment*/
    set outpatients0;
    idT=_n_;
run;
data inpatients0; /*Control*/
    set inpatients0;
    idC=_n_;
run;
* Randomly sort the tables;
proc sort data= outpatients0 out= outpatients (keep=pscoreT
idT);
     by RandomNumber;
run;
proc sort data= inpatients0 out= inpatients (keep=pscoreC
idC);
     by RandomNumber;
run;
data Matched(keep= IdSelectedControl MatchedToTreatID);
     length pscoreC 8;
     length idC 8;
     if _N_ = 1 then do;
        declare hash h(dataset: "inpatients", ordered: 'no');
        declare hiter iter('h');
        h.defineKey('idC');
        h.defineData('pscoreC', 'idC');
        h.defineDone();
        call missing(idC, pscoreC);
     end;
     set outpatients;    /*Treatment*/
     retain BestDistance 99;
     rc= iter.first();
     if (rc=0) then BestDistance= 99;
     do while (rc= 0);
        ScoreDistance= abs(pscoreT - pscoreC);
        if ScoreDistance < BestDistance then do;
           BestDistance= ScoreDistance;
           IdSelectedControl= idC;
           MatchedToTreatID= idT;
        end;
        rc= iter.next();
        if (rc~= 0) then do;
           output;
           rc1= h.remove(key: IdSelectedControl);
        end;
     end;
run;
/*select those matched inpatients*/
proc sql noprint;
     create table Tinpatients as
     select a.*,b.*
     from matched a join inpatients b
     on a.IdSelectedControl=b.idC;
quit;
proc freq data=Tinpatients;
     tables idC;
run;
proc freq data=Tinpatients;
     tables IdSelectedControl;
run;
data analysis;
     set outpatients Tinpatients;
run;
data aa;
     set analysis;
     prob=pscoreT;
     if pscoreC ne . and pscoreT=. then prob=pscoreC;
Run;
/*after matching evaluation*/
proc univariate data=aa noprint;
     class inout2;
     histogram  prob;
     inset N='N' (6.0)
          Mean='Mean' (4.2)   STD='STD' (4.2)/font='Arial'
          pos=ne  height=3;
run;
```

CONCLUSION

- Outpatients have lower peri-operative complication rates than inpatients
- Risk factors of short term complication: age, diabetes, presence of pre-operative wound infection, blood transfusion, operative time exceeding 150 minutes, and an inpatient hospital stay