

Statistics 220 – Term Project

Due: Wednesday, May 18, 2005

The term project will involve an analysis of a data set using the methods discussed in the course. You may use a data set of your own choosing or the data set described starting on page 2. If you decide to work with a data set of your own choosing, you should choose one of some complexity to challenge yourself. In your analysis, there need to be specific applied questions addressed.

Your report should be between 5 and 10 pages single spaced, including the important figures and tables. Additional tables and figures may be included in an appendix. Part of the goal for this project is to get you to right up your results in a clear and concise manor, which is important in many situations (e.g. journal articles, a consulting report to a client, or reports to employers, etc).

If you are using your own data set, please include a brief description of the data set in your report and please make it available to me in an electronic format, so if necessary, your analyzes can be investigated. You may make the data set available either by email, web link, or on disk. Note if there are possible confidentiality problems in making the data set available, please contact me as soon as possible.

Selective Bowel Decontamination for Prevention of Infections Following Liver Transplantation

Between September 1, 1991 and March 31, 1993, a controlled clinical trial was performed at the University of Chicago Hospital investigating the efficacy of Selective Bowel Decontamination (SBD) in patients receiving liver transplants. Infection by aerobic gram-negative bacteria and yeast is a common problem in liver transplant patients. Two different drug regimens were studied and the intent of the study was to examine whether the use of oral antibiotics prior to transplantation would lower the infection rate.

- IV only: This regimen consisted of intravenous cefotaxime and ampicillin administered 30 minutes before surgery, every 6 hours intraoperatively, and then every 8 hours thereafter for 48 hours. Each dose of cefotaxime or ampicillin for adults was 2g, and the dose for children (15 years or younger) was 40mg/kg.
- IV + GNP: This regimen consisted of ampicillin and cefotaxime administered as in the IV only regimen; a suspension of gentamicin (80mg/10mL), polymyxin E (100mg/10mL), and nystatin (2 million U/10 mL) given orally or per a nasogastric tube every 6 hours; and a paste containing 2% gentamicin, 2% polymyxin E, and 2% nystatin applied to the buccal mucosa every 6 hours while the patient was in the intensive care unit receiving respiratory support.

Each dose of the suspension of oral antibiotics for adults was 10mL; the dose for children ≤ 10 kg was 2.5mL, and the dose for children 11-30kg was 5mL. Patients who were to receive a cadaver liver were instructed to begin taking the suspension of oral nonabsorbable antibiotics when active search for a donor began; patients who were to receive a liver segment from a living related donor began taking the suspension of oral nonabsorbable antibiotics 3-5 days before the scheduled date of transplantation.

The primary question of interest is whether the addition of GNP for SBD lowers the infection rates due to bacteria and/or yeast (candida). Secondary questions of interest are which of the other variables in the data set can also have an effect on the infection rates and whether the anti-infection treatments have an effect on rejection rates.

The dataset involves 69 patients, 33 in the IV only group and 36 in the IV + GNP group. The following variables were collected on the study participants

- Gender
- Age in years
- Weight in kg
- Creatinine: highest level during 24 hours pre-op (mg/dL)
- Bilirubin: highest level during 24 hours pre-op (mg/dL)

- UNOS status: 2, 3, or 4. The higher the level, the higher the priority for receiving a transplant. A code of 0 indicates a missing UNOS status and only occurs when the donor organ is from a living relative. (UNOS = United Network for Organ Sharing).
- Major Diagnosis
 - 0 = biliary atresia
 - 1 = primary biliary cirrhosis
 - 2 = alcoholic cirrhosis
 - 3 = cryptogenic cirrhosis
 - 4 = viral hepatitis cirrhosis
 - 5 = rejection of previous transplant
 - 6 = other
 - 7 = colongitis
- Preinfect: active infection during one week prior to transplant
 - 0 = none
 - 1 = suspected (fever)
 - 2 = liver abscess
 - 3 = intraabdominal infection
 - 4 = nonabdominal infection
- PriorAB: systemic antibacterials during one week prior to transplant
 - 0 = none
 - 1 = narrow spectrum
 - 2 = broad spectrum
- PriorTX: number of prior liver transplants
- Donor: Donor type (0 = cadaveric, 1 = living related donor)
- Regimen: IVonly, GNPSHORT, GNPLONG. GNPSHORT is IV + GNP for 2 or less days prior to transplant. GNPLONG is IV + GNP for 3 or more days prior to transplant
- preGNP: days pre transplant on GNP. This should be 0 for all IV only subjects.
- postGNP: days post transplant on GNP. This should be 0 for all IV only subjects.
- postAB: days post transplant on IV prophylaxis
- Surgery: time of surgery in hours]

- Transfuse: number of blood volumes transfused
- Immuno: primary immunosuppression
 - 0 = cyclosporine + solumedrol
 - 1 = cyclosporine + immuran + solumedrol
 - 2 = FK506 + solumedrol
 - 3 = immuran + solumedrol
- Reject: number of rejection episodes
- Complic: number of complications during the first 4 weeks post transplant. These include, among others, bleeding, portal vein thrombosis, bile leak, retransplant, hepatic artery thrombosis.
- Lap: number of laparotomies during the first 4 weeks post transplant
- Bacteria: number of bacterial infections during the first 4 weeks post transplant
- Yeast: number of yeast (candida) infections during the first 4 weeks post transplant

Note that missing data is coded with NA.