Introduction

Surgical site infection (SSI) accounts for 16% of nosocomial infections in the United States[1]. SSI adds to the cost of hospitalization and increases morbidity and mortality[2]. In the pediatric population, SSI has been shown to increase hospital stay by an average of 10.6 days and increase cost by $27,000[3]. Antibiotic prophylaxis has been shown to be effective in preventing infections in breast, appendix, and colorectal surgery in adults[4]. However, there have been few studies conducted in pediatric patients evaluating the efficacy of prophylactic antibiotics for prevention of SSI. This retrospective study was undertaken to determine the effect of antibiotic prophylaxis in the prevention of SSI in children.

Methods

With IRB approval, the perioperative electronic clinical information database was queried. Pediatric patients (≤18 yrs) undergoing general surgery, cardiac surgery, and spinal surgery at Mott Children’s Hospital between January 2000 to April 2010 were included. Demographics and preoperative data were obtained from the Centricity intraoperative database and any episodes of SSI were obtained by review of the Infection control records.

SSI Case Ascertainment

Surgical site infections were defined as superficial incisional or deep incisional or organ/space SSI.

Deep incisional SSI: Infection occurs within 30 days after the operative procedure and involves only skin and subcutaneous tissue of the incision.

Deep incisional SSI: Infection occurs within 30 days after the operative procedure if no implant is left in place or within one year if implant is in place and the infection appears to be related to the operative procedure and involves deep soft tissues (e.g., fascial and muscle layers) of the incision.

Organ/Space SSI: An organ/space SSI is an infection occurs within 30 days after the operative procedure if no implant is left in place or within one year if implant is in place and the infection appears to be related to the operative procedure. Infection involves any part of the body, excluding the skin incision, fascia, or muscle layers, that is opened or manipulated during the operative procedure.

Table 1: Surgical Case Types

Table 2: Risk Factors for SSI

Results

Emphasis has been placed on pre-surgical incision antibiotic administration to reduce SSI. To date, there are few studies which have attempted to look at risk factors for SSI in the pediatric population. More specifically, the role of antibiotic prophylaxis. This is the first study, to our knowledge, to demonstrate the importance of appropriate antibiotic administration in children as a means to reduce SSI development. The importance of correct antibiotic usage and dosing plays a major role in decreasing risk of SSI in children. From the analysis of cardiac, neurosurgery, and general surgery cases at our institution the use of antibiotic prophylaxis prior to incision is a modifiable risk factor to help prevent SSI. Larger prospective studies are needed to look specifically at timing of antibiotics in prevention of SSI as well as other modifiable risk factors.

Discussion

Statistical Analysis

Statistical analyses were performed using PASW statistical software. Descriptive data were analyzed using frequency distributions. Correlations between variables were calculated using Spearman’s rho correlation coefficient. Chi-square analysis with Fisher’s Exact test were used to examine relationships between various independent variables and the dependent outcome variable of surgical site infection. Data are presented as n (%). Statistical significance was accepted at the 5% level (P < 0.05).

References