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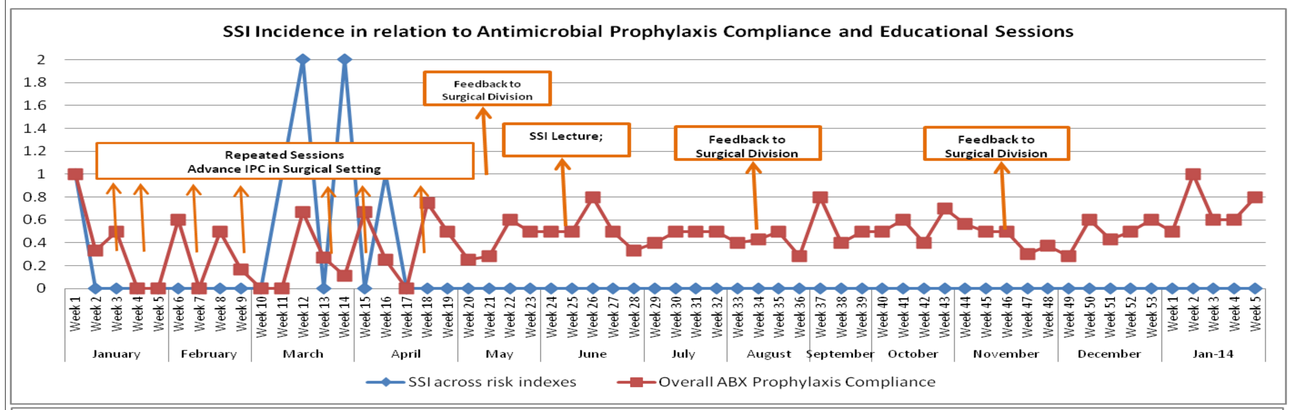
مستشفى الوكرة
Al Wakra Hospital
عضو في مؤسسة حمد الطبية
A Member of Hamad Medical Corporation

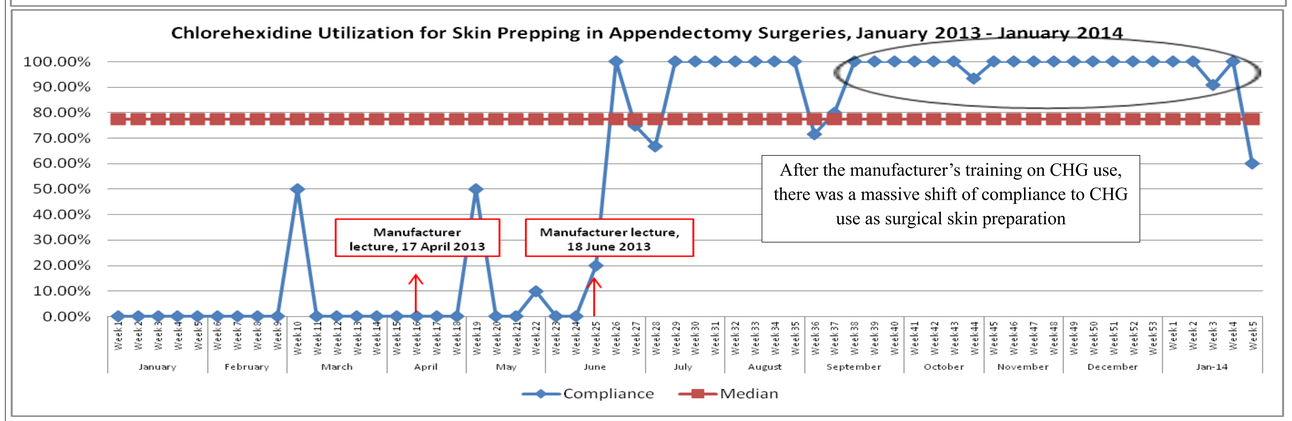
Impact of Antimicrobial Prophylaxis Compliance and Chlorhexidine GluconateUtilization for Skin Preparation in Reducing Surgical Site Infection amongst Appendectomy Surgeries, Al Wakra Hospital - 2013

PROBLEM:
Selected operations are being monitored for Surgical Site Infection (SSI), including all appendectomy cases. In 2013, among 305 Appendectomy surgeries, 7 developed SSI. In the first quarter alone, there was 9.09% [5/55 cases] SSI rate among Risk Index 0,1 appendectomies. In five of these SSIs, 4 did not receive appropriate antimicrobial prophylaxis and povidone iodine were used as surgical skin preparation. The overall compliance to antimicrobial prophylaxis in 1st quarter is only 31.03% which is the lowest antimicrobial prophylaxis compliance in all monitored general surgeries.

AIM:
. To decrease SSI and meet the target of 50th percentile of the National Healthcare Safety Network [NHSN, USA] by achieving the following goals:
1.To increase general compliance to antimicrobial prophylaxis from 31.03% in first quarter to the target compliance of 100%.
2.To utilize Chlorhexedine gluconate for skin preparation in majority of appendectomy surgeries.

METHODOLOGY:
. The Surgical Site Infection (SSI) review is done to all Appendectomy surgeries in Al Wakra Hospital regardless if laparoscopic or open surgeries. Each case are being reviewed for bundle compliance to SSI prevention which includes antimicrobial prophylaxis.
. Bundle compliance to Antimicrobial Prophylaxis is being reviewed per patient. The circulating nurse fills up the bundle forms and the operating theatre sends the forms to Infection Prevention and Control (IPC) monthly for encoding, analysis and review. Feedback of compliance are being forwarded and presented to the Surgical Division of Al Wakra Hospital for further review and actions.
. SSI surveillance are being carried out by the IPC Practitioner for Surgical Division by reviewing the patients' charts and by the use of the Post Discharge SSI Surveillance Notification Form being filled up by the nurses in the Surgical Outpatient (OPD) during follow up visits. Furthermore, results are being reviewed in the Electronic Medical Records if the patients develops positive cultures taken aseptically from the surgical site.
. If the patient fulfills the criteria for SSI, the attending physician is being informed by the IPC Practitioners. The SSI rates are also presented to the surgical division quarterly. A case study of the confirmed SSI cases are being presented as well.





INTERVENTIONS:
. Trainings were conducted with the Surgical Division staff including nurses and physicians regarding SSI and Antimicrobial Prophylaxis**.** Advance Infection Control in Surgical Setting, a 5-Continuing Nursing Education (CNE) point class was developed and ran for 8 sessions in 2013.
. Manufacturer's class regarding Chlorhexidine gluconate (CHG) skin preparation was attended by division and section heads and senior staff nurses
. Feedback sessions to Department of Surgery regarding SSI and Compliance to Antimicrobial Prophylaxis quarterly during division meetings
. Real time reporting of possible or confirmed SSI cases by electronic email to attending physician and/or division head
. Nurses to monitor and remind the physician regarding antimicrobial prophylaxis
. Anesthesia Team to administer antimicrobials after induction of anesthesia prior to cutting time

RESULTS:
. ***There were 7 SSIs among Appendectomy cases within 2013.***
. ***There is a total annual SSI rate of 2.05% amongst Risk Index 0,1 [6/293]. A dramatic decrease in Appendectomy SSI was observed with 9.09% (5/55) SSI rate in the 1st Quarter 2013 to 1.49% (1/67) in 2nd Quarter 2013 and on the second half of the year, there were Zero Tolerance for SSIs after measures on antibiotic prophylaxis and skin preparation were highlighted.***
. ***There is a total annual SSI rate of 8.33% [not accurate computation since computation cannot be done if denominator is less than 20 surgeries] SSI rate amongst Risk Index 2,3 [1/12]. A dramatic decrease in Appendectomy SSI was observed with 25.00% [1/5] in the second quarter and ZERO tolerance to SSIs for the last half of the year 2013 after the same measures were upheld.***

The Antimicrobial Prophylaxis has been identified as the main non-compliance to the SSI bundle with 37.40% noncompliance to correct antimicrobial use as per prescribed regimen [policy], 36.18% noncom-pliance to discontinuation of antimicrobials within 24 hours after closing time and 26.42% noncompliance to administration of antimicrobials within one hour prior to cutting time.

1. The compliance to antimicrobial administration one hour prior to cutting time among appendectomy surgeries in Al Wakra Hospital [January 2013—January 2014] shows that there is increased compli-ance with 100% compliance towards the third quarter 2013 but with minor dips in compliance on January 2014.

2. The compliance to proper antimicrobial prophylaxis based on Hamad Medical Corporation (HMC) policy among appendectomy surgeries revealed that although it has been fluctuating the rest of the year 2013; towards January 2014, there was a shift of compliance to proper antimicrobial use with more than the median use from Week 1—Week 5 of January 2014.

3. The compliance to discontinuation of antimicrobials within 24 hours after cutting time among appendectomy surgeries; it has still been fluctuating with better compliance towards the end of the year 2013 and January 2014.

CONCLUSIONS:
. After implementation, education and collaboration between different disciplines, there has been a decrease in the incidence of SSI with increasing compliance to antimicrobial prophylaxis and chlorhexidine gluconate skin prep use
. Surgical Site Infection rates went to zero for the second half of the year 2013 across all risk indexes
. Overall surgical antimicrobial prophylaxis reached 48.00% however did not meet the goal of 100%
. Annual compliance to administration of antimicrobial prophylaxis within 1 hour prior to skin-to-knife reached 84.38%
. Compliance to proper antimicrobial use based on policy: Cefuroxime + Metronidazole is 70.71%
. The primary reason for noncompliance is non-discontinuation of antimicrobial prophylaxis within 24 hours after closing time, which only reached to 65.46%
. There was a massive shift in the use Chlorhexidine gluconate skin prep from Povidone Iodine skin prep from Week 26 (June) to January 2014.

RECOMMENDATIONS:
. Maintain zero tolerance to SSI among Appendectomy surgeries across all risk indexes
. To achieve 100% compliance to general antimicrobial prophylaxis on all three elements
. Since the primary reason for noncompliance is non-discontinuation of antimicrobial prophylaxis within 24 hours after closing time, which only reached to 65.46%, it is important to in-clude the clinical pharmacist in reviewing the necessity of prolonging antimicrobial prophylaxis post operatively through the antimicrobial stewardship program
. Maintain best practices in utilization of chlorhexidine gluconate for skin preparation
. It is suggested that all new surgeons, surgical staff to have an orientation with Infection Prevention and Control to introduce them to the Surgical Site Infection Reduction Program

REFERENCES:
1. Anderson, D. et al. (2008). Strategies to Prevent Surgical Site Infections in Acute Care Hospitals. A Compendium of Strategies to Prevent Healthcare—Associated Infections in Acute Care Hospitals. Infection Control and Hospital Epidemiology, Vol. 29, No. S1. United States of America.
2. Mangram, A. et al (1999). Guideline for Prevention of Surgical Site Infection. Centers for Disease Control and Prevention. United States of America.
3. Surgical Site Infection: Prevention and Treatment of Surgical Site Infection. (2008). National Institute for Health and Clinical Excellence (NHS). United Kingdom