Evaluation of Methods Predicting and Preventing Clostridium Difficile Infection

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Introduction

Background

- Clostridium difficile[1,2]
  - ✧Spore forming, anaerobic gram positive bacillus
  - ✧Spread via fecal-oral route
  - ✧Produces and releases toxins A and B
  - ✧Symptoms ranging from asymptomatic carrier, to diarrhea, to colitis, or to pseudomembranous colitis.
- Clostridium difficile infection (CDI)
  - ✧Rising concern in hospitals and long term care facilities due to patients being prescribed antimicrobial(s) and exposure to organisms

Risk factors

- Exposure to broad-spectrum antibiotics[1,2]
- Exposure to the organism[1,2]
- Other risk factors: reduced gastric acid, immunosuppressive therapy, serious underlying illness and co-morbidities, gastrointestinal surgery, long duration of hospitalization, advanced age, etc. [1,2]

Prevention Strategies

- Antibiotic Stewardship[1,2]
- Hand hygiene and barrier precautions[1,2]
- Discontinue proton pump inhibitors (PPIs) to prevent CDI recurrence.[3]
- American Society of Health System Pharmacists (ASHP) Guidelines [4]
  - ✧Recommends stress ulcer prophylaxis (SUP) with gastric acid suppressants for patients in the intensive care unit (ICU) meeting specific criteria
  - ✧SUP for adult patients in non-ICU settings are not recommended
- Probiotics may have moderate effectiveness in primary prevention of CDI.[5]

Objective

The purpose of this study is to appropriately evaluate patients at risk of developing CDI, and to appropriately discontinue offending agents, if warranted, for patients identified as being high risk for developing CDI.

Data Collection Sheet

Vigilanz Reporting: Identify/capture patients on Proton Pump Inhibitors PLUS one of the following high risk target antibiotics:

High Risk Target Antibiotics (Include but are not limited to)

- Cephalosporins
- Clindamycin
- Ampicillin
- Fluoroquinolones

Calculation of C. difficile Score:

Prior hospitalization in past 60 days	(1 point)
ICU stay	(1 point)
Other case of CDI on unit	(1 point)
CDI history within past 60 days	(1 point)
Admission albumin <3.5	(1 point)
H2 blocker/PPI use	(1 point)
Anti-motility drug	(1 point)
High-risk antibiotic within last 30 days	(1 point)

*Recent CDI within last 30 days automatically receive 3 points

Data Collection Sheet: Excel Spreadsheet- includes drop down box

- Patient ID
- Gender
- Age
- PPI use (YES or NO)
- Antibiotic (Ampicillin, Cephalosporins, Clindamycin, Fluoroquinolones)
- Intervention (Blue note left in chart, MD call, Progression note left in chart)
- Intervention Accepted (YES or NO)

*Data collection sheet created by Edoabasi McGee and Samuel John to keep track of interventions from clinical pharmacy side.

Stress Ulcer Prophylaxis Assessment

Date:	Time:

Please check the appropriate boxes

Patient currently receiving the following stress ulcer prophylaxis: ☐ Pantoprazole ☐ Famotidine

Patient on therapeutic acid suppression therapy for:

☐ Upper GI bleeding ☐ Therapy continued from home
☐ History of transplantation ☐ Maintenance treatment of PUD
☐ GERD, dyspepsia or erosive gastritis/esophagitis ☐ Other: _____

Patient in Non-ICU area with **at least two** of the following risk factors for developing stress ulcer bleeding:

☐ Mechanical ventilation (auto qualification) ☐ Renal Failure❖
☐ History of transplantation (auto qualification) ☐ Head injury with GCS ≤ 10
☐ Combination therapy with at least 2 of the following: ☐ Thermal injuries > 35% of BSA
(aspirin, clopidogrel/prasugrel/ticagrelor, and/or warfarin or dabigatran/rivaroxaban/apixaban/edoxaban) ☐ Partial hepatectomy
☐ History of upper GI bleed, peptic ulcer, or erosive gastritis within last year ☐ Multiple trauma
☐ Coagulopathy* ☐ Liver failure†

*Defined as platelets < 50,000 or INR above 1.5 or pTT above 2x normal for 24 hours; does not include drug-induced coagulation.

❖Defined as Estimated Creatinine Clearance < 40 mL/min or SCr > 2.8 mg/dL, Chronic Renal Failure: Stage 4 or 5 CKD

†Defined as any two of the following: Serum bilirubin >8.8 mg/dL, AST >500 U/L, Alb <4.1 g/dL, clinical signs and symptoms of hepatic coma

Based on the above risk factors the following stress ulcer prophylaxis protocol order has been implemented:

☐ Change Pantoprazole to Famotidine ☐ Continue current acid suppression therapy
☐ Change Famotidine to Pantoprazole ☐ Continue with no acid suppression therapy
☐ Discontinue Famotidine or Pantoprazole as there is no documentation of an indication for the therapeutic acid suppression or stress ulcer prophylaxis

C. diff risk score as reported in Vigilanz: _____ (>3 = High Risk)

Clinical Pharmacy Checklist:

☐ Probiotic
☐ Culturelle 1 tablet po BID
☐ Contraindication/Warning to use:
☐ Immunocompromised (HIV) (Chemo)
☐ Pancreatitis
☐ Clinical Pharmacist DC H2 blocker/PPI
☐ Infectious Disease Consult to evaluate antibiotics
☐ Prophylaxis Initiated
☐ Metronidazole (Flagyl®) 250 mg po BID
☐ Rifaximin (Xifaxan®) 550 mg po BID

Intervention:

☐ Blue note left in chart
☐ Progress Note left in chart
☐ Call made to MD _____

Printed Name: _____ Date/Time: _____
Signature: _____ Phone/Pager: _____

Methods

Study Design

- Three month pilot study from September 2015 to December 2015
- An electronic medical record system, Vigilanz™, provided daily reports scoring patients based on risk factors shown under Data Collection Sheet
- Patients with a score of three or higher were defined high risk
- High risk patients were reviewed by the pharmacist and appropriate CDI preventative recommendations were noted in the patient's chart or via recommendations to attending physicians during multidisciplinary rounds

Data that will be collected

- Percentage of high risk patients on the floor
- Cases of hospital onset CDI
- Percentage of pharmacist interventions accepted
  - ✧Type and method of intervention accepted
- Percentage of inappropriate PPI use

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Disclosure

Authors of this presentation have nothing to disclose concerning financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation.