Improving Group B Streptococcus Susceptibility Testing

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Background

Group B streptococcus (GBS) is the leading cause of newborn infection. The primary risk factor for GBS early onset disease (EOD) is maternal colonization of the genitourinary and gastrointestinal tracts. Vertical transmission most commonly occurs during labor or after rupture of membranes[1]. GBS is a facultative gram-positive organism and a physiologic component of some women's intestinal and vaginal microbiomes. The prevalence of colonization in women is between 10-30%. GBS early onset disease (EOD) presents 7 days after birth and occurs secondary to vertical transmission. This is characterized by sepsis, pneumonia, or meningitis. It usually manifests within the first 12-48 hours after birth [2].

According to practice guidelines by the American Congress of Obstetricians and Gynecologists (ACOG), all pregnant women should undergo antepartum screening for GBS at 36 0/7- 37 6/7 weeks of gestation unless intrapartum bacteriuria during pregnancy has been identified or they have a history of a newborn born with GBS infection[2]. Those that are GBS positive or are found to have risk factors for GBS should be treated with prophylactic antibiotics based on Centers for Disease Control (CDC) guidelines[3]. Penicillin is the preferred first-line agent due to its narrow spectrum of antimicrobial activity. Clindamycin is the recommended alternative for those who are at high risk for anaphylaxis due to Penicillin allergy. Clindamycin can only be given if the GBS isolate is known to be susceptible because rates of resistance are around 20% [2].

IV Vancomycin is the only intrapartum prophylaxis option for women with a high-risk Penicillin allergy and whose GBS isolate is not susceptible to Clindamycin (or has not been tested for susceptibility). The current Vancomycin dosage used for GBS prophylaxis produces adequate maternal levels but studies are controversial on whether the current dosage achieves adequate levels in the fetal circulation[4]. In addition, using broad-spectrum antibiotics such as Vancomycin has been shown to increase bacterial resistance to antibiotics. It has also been associated with alterations in the gut microbiome of newborns and related to allergies, asthma, and obesity later in life[5].

Quality Issue

Patients who present to Obstetrics Triage or Labor & Delivery at HCA Florida Osceola Hospital without a prior GBS test result and have GBS testing performed do not currently have susceptibility testing for Clindamycin performed on their specimen if they have a high-risk allergy to Penicillin. This results in a high rate of Vancomycin use in patients in preterm labor or in labor for GBS prophylaxis.

Objective

The aim of this project is to reduce the number of patients who receive Vancomycin in labor by testing the GBS isolates of patients with a high-risk Penicillin allergy for susceptibility to Clindamycin.

Methods

Study Time Period
2022-2023

Inclusion Criteria
Pregnant patients of all ages who are GBS positive and allergic to Penicillin

Intervention
Hard-stop created in Meditech when order for GBS testing placed to remind physicians to order Clindamycin susceptibility testing on patients who are allergic to Penicillin
Clindamycin sensitivity testing performed in lab
Patients dosed with appropriate antibiotic (Clindamycin vs. Vancomycin)

Data Collection
Compare group of GBS positive patients who are allergic to Penicillin 6 months prior to and 6 months after order change for difference in rates of Vancomycin usage

PDSA Cycle

Discussion

We are currently implementing the DO portion of the PDSA cycle with Meditech order changes in progress (pending approval by Medical Executive Committee). We anticipate full implementation in June 2023.

The next step will be the STUDY portion of the PDSA cycle, which we will undertake 6 months after implementation.

We predict that after implementation of our plan, the number of patients in labor who are GBS positive with high-risk Penicillin allergy that receive Vancomycin for GBS prophylaxis will be significantly lower than in the pre-intervention group.

If improvements are demonstrated as predicted, we will continue with the GBS test order change. If no improvements demonstrated, we will restart the PDSA cycle.

Conclusion

Implementing GBS susceptibility testing is an evidence-based and guidelines-based method to improve the quality of patient care received on Labor & Delivery at HCA Florida Osceola Hospital.

References

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