Cephalosporin Cross-Reactivity with Penicillin Allergy - What is the Risk in Pediatrics?
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Introduction

- The perioperative administration of antibiotics is an important mechanism to limit the risk of surgical site infections.
- For the majority of surgical procedures, antibiotic prophylaxis with a cephalosporin is recommended. Issues arise when patients present with a history of penicillin allergy.
- Although it is taught that there is cross-sensitivity of 10% between penicillins and cephalosporins, this has been refuted in the literature.1-4
- If one eliminates the use of perioperative cephalosporins for antibiotic prophylaxis, alternative antibiotics such as vancomycin, or clindamycin, may be used.
- While effective, these antibiotics may have a higher adverse effect profile than cephalosporins and require a longer duration of infusion for administration of 30-60 minutes.
- Additionally, the indiscriminate use of such antibiotics may be one mechanism responsible for the emergence of resistant organisms.

Methods

- Our project consisted of a retrospective review of anesthesia records which will eventually encompass the past 5 years of practice at Nationwide Children’s Hospital.
- It will identify patients with a history of penicillin allergy and the reason for that registered allergy.
- Additionally, the choice of antibiotic prophylaxis will be recorded, and any adverse effect to that antibiotic noted.
- We will determine whether appropriate timing of the antibiotic is achieved.
- Patients scheduled for craniotomy procedures are excluded as they primarily receive vancomycin prophylaxis as an institutional guideline.

Results

- To date, we have retrospectively reviewed the records of 103 patients with documented penicillin allergy. Four of these patients were eliminated due to institutional use of vancomycin for craniotomy procedures.
- There were 44 girls and 55 boys with a mean age of 13.5 ± 5.5 years.
- Of the remaining 99 registered penicillin-allergic patients, 40 were reported to have experienced rash, 28 patients were listed as having had hives, and 17 had an unknown reaction. Four patients were classified as having experienced anaphylaxis with prior penicillin use.
- Of this group, 19 patients received cephalosporin for prophylaxis without any reported reactions.
- The most common substitute antibiotic for cephalosporin was clindamycin.
- Two patients who received clindamycin experienced rash and hives after antibiotic administration. One patient had a significant reaction after the administration of ciprofloxacin, including hives, fever and hemodynamic changes.
- Antibiotics were administered on average within 10.5 ± 16 minutes of incision.

Discussion

- Based on our preliminary findings, the cross reactivity between penicillin and cephalosporins is lower than the reported 10%.
- These findings should lead us to consider the use of cephalosporins for surgical prophylaxis even in patients who present with penicillin allergy, unless there is a history of true anaphylaxis.
- Alternative prophylactic antibiotics can lead to significant adverse effects.
- The true cross-reactivity and morbidity of cephalosporins in the setting of registered penicillin allergy should be further scrutinized.

References

4. Image: www.imagas.tutorvista.com