

Beta-Lactam Allergy Assessment And Management Service: a Pharmacist-led Approach

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ABSTRACT

Background: Inaccurate allergy labeling results in inappropriate antimicrobial management of the patient, which may affect clinical outcome, increase the risk of adverse events and increase costs. Inappropriate use of alternative antibiotics has implications for antimicrobial stewardship programs and microbial resistance. As part of an antimicrobial stewardship program there is scope for a pharmacist-led program promoting appropriate antimicrobial allergy labeling through history and directed testing and challenge.

Methods: A specialist pharmacist identified adult inpatients labeled as penicillin allergic, consented and screened them for eligibility. The pharmacist took an accurate allergy and medication history. If deemed appropriate and safe, an oral challenge was performed or the patient was referred to an Immunology clinic. All patients included in the study were followed-up one year after intervention.

Results: 250 eligible patients were identified as labeled as penicillin allergic. The prevalence of reported penicillin allergy at our hospital was 10.8%. We found that 79.6% of these patients could be delabeled in our study population. Of those, 80.4% were delabeled after consultation with a specialist pharmacist, 15.6% had an uneventful oral challenge, and 4% were deemed inappropriately labeled after referral to the Immunology clinic. The remaining 20.4% of patients were deemed to be appropriately labeled after consultation with a specialist pharmacist. These patients had longer length of stays (9 vs. 6 days), more ICU admissions (7/51 vs. 3/199 admissions) and were prescribed more courses of antibiotics in the community over one year (4.6 vs. 2.3 courses). The cost associated with treating penicillin allergic labeled patients was 1.8 times greater in the community and 3.8 times more in the hospital setting. Changes in antibiotic therapy were recommended in 132 (66.3%) delabeled patients, of which none had adverse events after commencing on a penicillin antibiotic. At the one-year follow-up, 98.4% of patients who were delabeled had no adverse events to repeated administration of penicillin antibiotics.

Conclusion: This study showed that a pharmacist-led antibiotic allergy management service is a safe and cost effective option to promote appropriate antimicrobial prescribing and can play an integral role in antimicrobial stewardship.

BACKGROUND

- There is a growing emphasis on antimicrobial stewardship programs, aiming to increase the judicious use of antimicrobials and optimize patient care
- Prevalence of penicillin allergy has been estimated between 10-20% of hospitalized patients
- Large proportion (80-90%) of patients labeled as penicillin-allergic are found to be negative on skin testing
- Consequences of inappropriate penicillin allergy labels include limiting therapeutic options, increased broad spectrum or second-line antibiotic use (perhaps less efficacious), increased risk of toxicity, and increased costs
- Penicillin delabeling services are often limited by resources and the capacity of healthcare system. Pharmacists may provide a solution as part of a comprehensive antimicrobial stewardship program

METHODS

Study design and setting: Descriptive cohort study with prospective data collection, conducted over 32 days, in a 1000-bed tertiary care hospital

Patient selection: all adult inpatients admitted for more than 24 hours with a putative allergy/intolerance to penicillin antibiotics at the time of admission

Interventions: All patients were consented prior to interventions and screened for suitability. All eligible patients underwent a consultation with the specialist pharmacist (see figure 1)

Follow-up: all patients who accepted an intervention were followed up one year after intervention to determine safety of intervention and subsequent usage of antibiotics

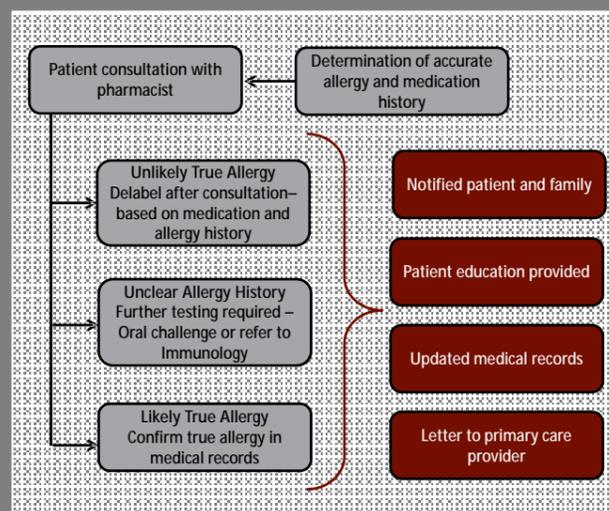


Fig 1. Interventions provided to patients after consent and consultation.

RESULTS (1)

- 274 patients were identified during study period, of which 250 patients were included and consented (24 patients excluded due to language or cognitive difficulties)
- Prevalence of penicillin allergy in hospitalized patients: 10.8%
- 79.6% of patients were delabeled during the study

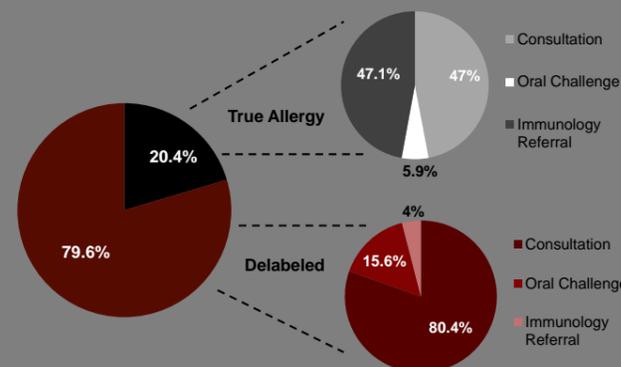


Fig 2. Description of interventions resulting in delabeling or true allergy label.

Table 1. Patient demographics of intervention groups.

	Delabeled n=199	True Allergy n=51	p
Gender			
Female (%)	125 (62.8)	31 (60.8)	-
Male (%)	74 (37.2)	20 (39.2)	-
Age (years) Mean ± SD	63 ± 19.2	65 ± 16.8	-
Ethnicity			
Maori/Pacific Island (%)	59 (29.6)	21 (41.2)	0.0617
NZ European (%)	96 (48.2)	20 (39.2)	<0.0001
Length of Stay (days) Mean ± SD	6 ± 5.4	9 ± 7.5	0.0013
ICU admission (n) (Relative Risk 3.818)	3	7	0.0004

RESULTS (2)

- Safety of delabeling after intervention:
 - Total number of adverse drug reactions recorded one-year post-intervention: 3/199 (all delayed rash reactions)
 - Safety of delabeling: 183/186 (98.4%) had no adverse drug reactions after repeated penicillin administration
- Cost of antibiotic treatment:
 - Community antibiotic treatment was 1.87 times greater in the true allergy group
 - Hospital antibiotic treatment was 3.81 times greater in the true allergy group

Table 2. Change of Betalactam antibiotic (penicillin and cephalosporin) courses prescribing per intervention group.

	Delabeled n=199	True Allergy n=51	p
Betalactam courses prescribed pre-intervention (mean ± SD) one year prior	1.31 ± 0.79	1.48 ± 0.57	0.0074
Betalactam courses prescribed post-intervention (mean ± SD) one year post	1.82 ± 1.25	1.05 ± 0.21	<0.0001
p	<0.0001	<0.0001	

SUMMARY AND CONCLUSION

Approximately 10% of our hospital population were labeled penicillin allergic. In our population, 80% of patients were found to be inappropriately labelled as penicillin-allergic and 98.4% were safely delabelled without any adverse drug reactions.

Patients found to be appropriately labelled as penicillin allergic had a higher risk of ICU admission, longer length of stay when admitted and greater costs associated with antibiotic treatment, both in the community and in hospital.

Pharmacists, if resourced, are uniquely placed to provide a safe, extended allergy service to contribute to antimicrobial stewardship programs.

REFERENCES

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