



ANTIBIOTIC ALLERGY AND BROAD-SPECTRUM ANTIBIOTICS

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Background

- A reported antibiotic allergy often leads to prescription of broader-spectrum antibiotics
 - Often not as efficacious
 - Increased length of stay and cost
 - Increased *Clostridium difficile*
 - Increased acquisition of resistant bacteria
- Antibiotic allergy frequently over-reported

Loo VG, et al. *N Engl J Med* 2005;353:2442-9. Safdar N *Ann Intern Med*. 2002;136(11):834-844. Martinez JA et al. *Arch Intern Med*. 2003;163(16):1905-1912 McGowan, J *Clin Infect Dis*. 1983; 5(6):1033-1048. Macy E et al *J Allergy Clin Immunol*. 2014, 133(3):790-6. Gay KJ et al. *Int J Pharm Pract*. 2009;17(4)2535. [Absy M](#), [Glatt AE](#) *Southern Medical Journal* 1994, 87(8):805-80

Aims

- Examine the frequency of reported antibiotic allergy/AE at the Royal Hobart Hospital
- Examine the impact reported antibiotic allergy has upon the hospital's use of broad-spectrum/restricted antibiotics
- Assess completeness and consistency of antibiotic allergy documentation

Method

- Approved by Tasmanian Human Research Ethics Committee
- Evaluated 2 groups over 6 month period:
 1. Adult admissions with a diagnosis of pneumonia
 - Proportion with reported history of antibiotic allergy (especially penicillin)
 2. Patients who received restricted antibiotics due to reported allergy to first line agent
 - Identified through hospital's stewardship program
 - Compared to hospital's overall use of restricted antibiotics
- All notes reviewed for:
 - Documentation of allergy (nature of reaction, time of reaction)
 - Details of management
 - Consistency of documentation

Antibiotic allergy is over-reported

Pneumonia admissions

- 72/424 (17%) reported an antibiotic AE
- 44/424 (10%) to penicillin
- Previous studies estimate 5-10% of population report a penicillin allergy history.
- Other studies: **85%** actually tolerate penicillins when challenged

Antibiotic allergy is over-reported

Pneumonia Cohort: Reported anaphylaxis to penicillin was very high

- 8/424 (2%) anaphylaxis/swelling of throat
- 7 (2%) 'swelling' or 'angioedema'
 - Penicillin anaphylaxis estimated 1-4/10,000

RHH rate 50-400X this!!!!

Antibiotic allergy is over-reported

Pneumonia admissions

- 6/72 (8%) given antibiotic reported to be allergic →

None reacted!



Antibiotic allergy is over-reported

Patients prescribed restricted antibiotics

- 11 patients given antibiotic with reported allergy (one planned)
 - Only 1 reacted (itch following clindamycin)

Antibiotic allergy histories frequently incomplete

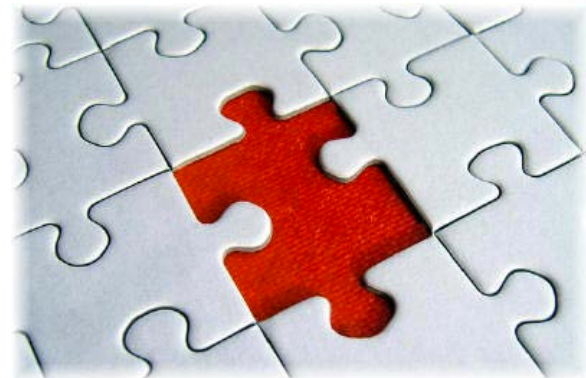
- In both cohorts, the nature of reaction frequently not documented:
 - Pneumonia cohort with penicillin allergy: 14/44 (32%)
 - Restricted antibiotic cohort: 11/84 (13%)

Notes section	% Reaction documented
ED notes	38%
Admission notes	54%
Drug chart	72%
Discharge summary	73%
Alert (electronic records)	25%

Reaction documentation in different parts of the notes amongst patients prescribed restricted antibiotics.

Antibiotic allergy histories frequently incomplete

- In both cohorts, time of reaction almost never described:
 - Pneumonia cohort: 68/72 no time
 - 2/72 40-50 years ago, 1 recent
 - Other 1 reaction during admission
 - Restricted antibiotic cohort: 73/84 no time
 - 4/84 in childhood or >40 years ago
 - Other 7 reactions during admission



Antibiotic allergy histories often conflicting

- Pneumonia cohort: 18/72 (25%)
 - Which antibiotic: 14/18
 - Nature of reaction: 5/18
- Restricted antibiotic cohort: 14/84 (17%)
 - Which antibiotic 11/14
 - Nature of reaction 3/14



Tolerance not documented

- 16 patients tolerated antibiotic with reported allergy
 - Only once documented in discharge summary to GP
 - 13/16 (81%) patients still have an alert for allergy



Antibiotic allergy and use of restricted antibiotics

- Restricted antibiotics
 - 104 cases in 84 patients of prescription of restricted antibiotic
 - 80/84 (95%) patients reported penicillin allergy
 - 15 reported anaphylaxis to penicillin, 6 swelling or angioedema

	Patients	DDD/1000 PBD	Proportion of hospital's use
Vancomycin	17	3.5	15%
Ceftriaxone	45	1.7	4%
Cefepime	6	3.0	100%
Fluoroquinolones			
Ciprofloxacin	21	2.9	7%
Moxifloxacin	11	1.6	44%
Total	32	4.5	9%

Restricted antibiotics used due reported antibiotics allergy or adverse event

DDD Defined daily dose (as defined by World Health Organisation)

PBD Patient bed days

What can be improved?

- Education and increase awareness
- A designated location and person for accurate allergy details
- Strategies for removing uncertainty
 - Careful history and chasing old notes
 - Skin testing, challenge
- De-labelling when antibiotic tolerated
 - Letter to patient



In summary

- Antibiotic allergy, particularly penicillin allergy is over-reported at RHH.
 - Especially anaphylaxis – 50-400X!
- Antibiotic allergy is often poorly documented, histories are incomplete. Uncertainty is common.
- Therefore too many restricted antibiotics are used.
- This likely leads to adverse outcomes including increased resistant bacteria, *Clostridium difficile*, cost, length of stay and poorer outcome.
- Health professional education, guidelines and a definitive location for information on antibiotic history may help.

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