THE CLINICAL IMPACT OF PENICILLIN ALLERGY LABELS ON PEDIATRIC OUTPATIENTS

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Background: Up to 10% of children carry a penicillin allergy label (PAL), but more than 90% of these children will have negative penicillin allergy testing and tolerate penicillin antibiotics. In adults and pediatric inpatients, PALs are associated with poor clinical outcomes, but the effect of PALs on pediatric outpatients is currently unknown. The objective of this study was to determine the impact of PALs on prescribing practices and outcomes in children treated for outpatient respiratory tract infections (RTIs). We hypothesized that children with PAL at the time of a RTI would receive more broad-spectrum and second-line antimicrobials compared to non-labeled children and would have more treatment failures, adverse drug events, and infectious complications compared to non-allergic children receiving first line antimicrobials.

Materials/Methods: This was a dual-center, retrospective, longitudinal birth cohort study of children born between January 2010 and June 2020 who sought care in the Children's Hospital of Philadelphia Primary Care Network or Texas Children's Pediatrics clinics. Index RTIs were defined as encounters for acute otitis media, acute bacterial sinusitis, streptococcal pharyngitis, or community acquired pneumonia without an antibiotic prescription in the preceding month. Outcomes of interest were broad-spectrum and second-line antimicrobial use, treatment failures, adverse drug events, and infectious complications. The exposure of interest was presence of a PAL at the time of index RTI, but for post-infectious outcomes, non-allergic children receiving broad-spectrum antibiotics were additionally excluded from the analysis. Multivariable logistic regression was used for the analysis.

Results: Of 12,205,235 encounters in 334,465 children, 663,473 were encounters for an index RTI. Children with a PAL (5.4% of cohort) were more likely to receive a broad-spectrum antibiotic (aOR 102.1, 95% CI 96.0-108.7) and second line antibiotic (aOR 171.8, 95% CI 162.0-182.1) compared to children without a PAL and were more likely to have a treatment failure (aOR 2.4, 95% CI 2.3-2.5) or an adverse event (aOR 6.0, 95% CI 5.4-6.6) following an index RTI compared to non-labeled children receiving first-line antimicrobials (Table 1). Infectious complications were rare (<0.01 %) and no different between the groups.

Conclusions: PALs greatly influence antibiotic prescribing practices and have a negative impact on pediatric outpatient clinical outcomes.

Images / Graph / Table

Antibiotic Prescribing Outcome	Total N = 663,473	Allergic N = 35,771	Non-Allergic N = 627,702	Chi2 p value	Multivariable OR [95 % CI]*	p-value
Broad-Spectrum Antibiotic Use	213,038 (32.1%)	34,719 (97.1%)	178,319 (28.4%)	<0.001	102.1 [96.0-108.7]	<0.001
Second-Line Antibiotic Use	153,302 (23.1%)	34,557 (96.6%)	118,745 (18.9%)	<0.001	171.8 [162.0-182.1]	<0.001
Post-Infectious Outcome	Total N = 516,610	Total N = 35,771	Total N = 480,839	Chi2 p value	Multivariable OR [95 % CI]*	p-value
Treatment Failure	14,067 (2.7 %)	1,694 (4.7%)	12,373 (2.6%)	<0.001	2.40 [2.27-2.53]	<0.001
Adverse Drug Event	2,669 (0.5 %)	584 (1.6 %)	2,085 (0.4 %)	<0.001	5.95 [5.40-6.56]	<0.001
Infectious Complication	11 (<0.01 %)	1 (<0.01 %)	10 (<0.01 %)	0.777	1.42 [0.18-11.45]	0.741