

Healthcare Providers' Knowledge of Immunologically-Mediated Adverse Drug Reactions: Where Are The Gaps?

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INTRODUCTION:

Immunologically-mediated adverse drug reactions (ADRs) can cause significant morbidity and mortality to patients, and pose a burden to the hospital system. Examples include anaphylaxis and severe cutaneous adverse drug reactions (SCARs) including Stevens-Johnson Syndrome/toxic epidermal necrolysis (SJS/TEN) and drug rash with eosinophilia and systemic symptoms (DRESS). Understanding the mechanisms, diagnosis and appropriate management of ADRs is essential to optimise patient care and prevent subsequent reactions.

At Alfred Health, a major metropolitan health service in Melbourne, 85% of ADR reports were submitted by pharmacists and 9% by medical doctors in 2016.

Healthcare providers' knowledge and assessment of severe immunologically-mediated ADRs has not been adequately studied.

OBJECTIVE:

To evaluate healthcare providers' understanding of the principles of immunologically-mediated ADRs.

METHODS:

A knowledge survey was conducted amongst doctors and pharmacists (online or face-to-face sessions) over three months from December 2016 to February 2017 at Alfred Health.

The survey comprised thirteen best-response multiple-choice questions for five realistic ADR scenarios.

Themes included syndromic recognition (immediate vs. delayed hypersensitivity reactions), severe cutaneous adverse drug reactions (SCAR), diagnostics, causality evaluation, antibiotic cross-reactivity and risk communication.

RESULTS:

Ninety-nine participants completed the survey: 74 (74.7%) doctors (including 20 (27.1%) dermatologists) and 25 (25.3%) pharmacists.

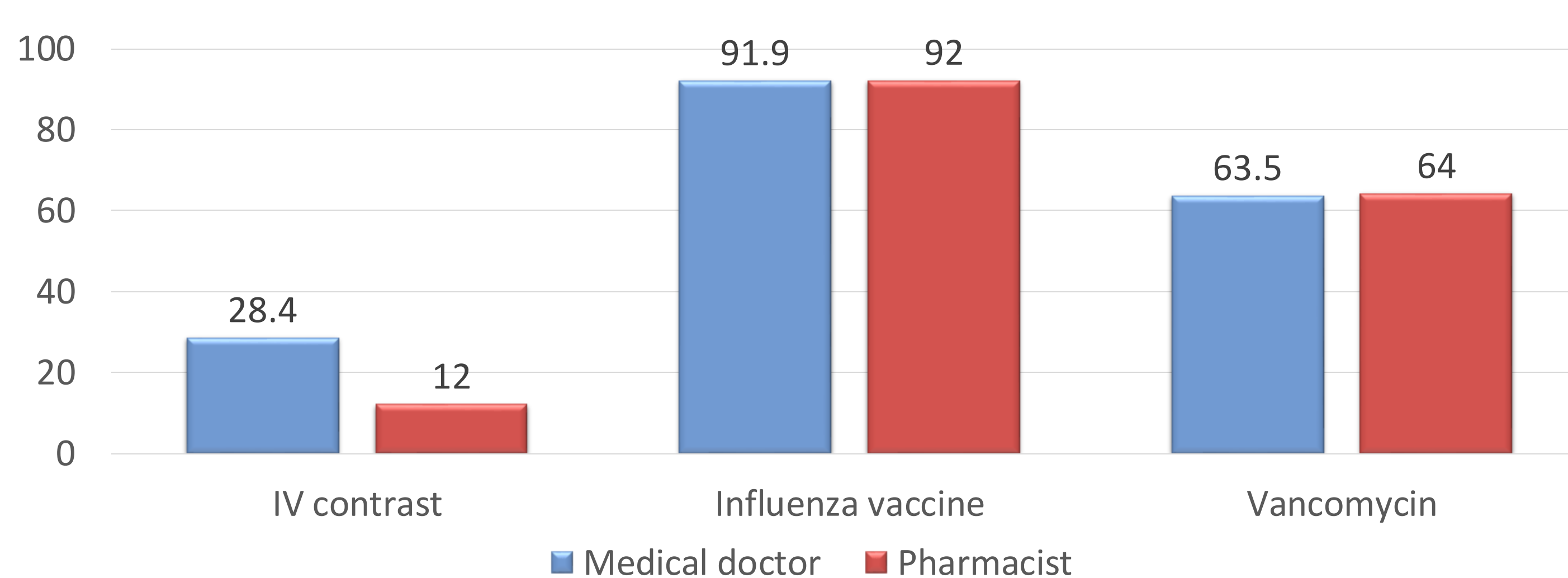


Figure 1: Proportion of correct responses: Recognition of IgE vs non-IgE mediated immediate hypersensitivity reactions

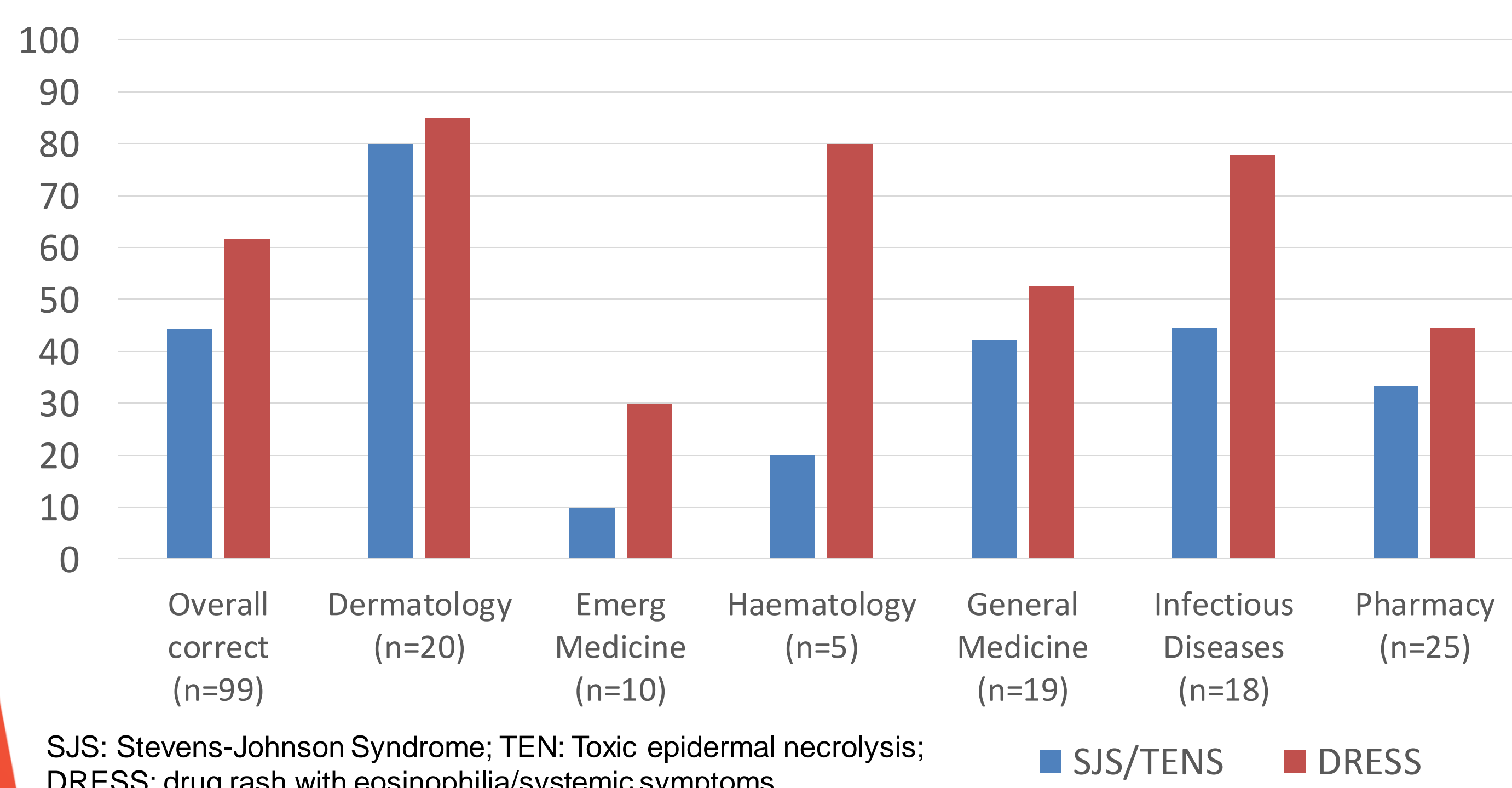


Figure 2: Proportion of correct responses: drug causality identification, by specialty

Table 1: Number and proportion of correct responses to survey questions

Question	Medical doctor (N=74) n (%)	Pharmacists (N=25) n (%)	P value
IgE vs non-IgE reactions			
Reaction to IV contrast (non-IgE)	21 (28.4)	3 (12.0)	0.11
Reaction to influenza vaccination (IgE)	68 (91.9)	23 (92.0)	1.00
Reaction to vancomycin (non-IgE)	47 (63.5)	16 (64.0)	1.00
Antibiotic cross-reactivity & Diagnostics			
Negative predictive value of penicillin skin testing	39 (52.7)	5 (20.0)	0.005
Isolated aminopenicillin reactions	59 (79.7)	20 (80.0)	1.00
Cephalosporin cross reactivity	39 (52.7)	13 (52.0)	1.00
Aztreonam cross reactivity	34 (45.9)	10 (40.0)	0.65
SJS/TEN			
Drug causality attribution	34 (45.9)	9 (36.0)	0.49
Appropriate diagnostics	61 (82.4)	15 (60.0)	0.03
Risk communication	23 (31.1)	6 (24.0)	0.62
DRESS			
Drug causality attribution	49 (66.2)	12 (48.0)	0.15
Sulfa cross-reactivity	52 (70.2)	13 (52.0)	0.14
Desensitisation potential	34 (45.9)	8 (32.0)	0.25

IV: Intravenous; SJS: Stevens-Johnson Syndrome; TEN: Toxic epidermal necrolysis; DRESS: drug rash with eosinophilia and systemic symptoms

DISCUSSION:

Doctors and pharmacists' results for individual questions were not significantly different, with the exception of questions related to the negative predictive value of penicillin skin testing and SJS/TEN diagnostics, where doctors performed better than pharmacists.

Deficiencies in knowledge were noted for both pharmacists and medical doctors in:

- Recognition of non-IgE mediated mechanisms of immediate hypersensitivity reactions
- Drug causality attribution for delayed hypersensitivity reactions
- Beta-lactam and sulfa drug cross-reactivity patterns
- Desensitisation potential for allergic reactions

CONCLUSION:

Timely recognition, diagnosis and management of severe immunologically-mediated ADRs is essential for safe patient care.

Healthcare providers' knowledge on ADR principles was found to be limited.

As pharmacists play a key role in reporting ADRs, causality attribution should be an area for expanded and targeted education.

A multicentre study involving four major Melbourne hospitals is underway to develop a collaborative education module for both pharmacists and medical doctors to address the knowledge gaps identified by this study.