Re-immunization of Patients with Adverse Events Following Immunization in the Canadian Special Immunization Clinic Network

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Background

- An adverse event following immunization (AEFI) can increase vaccine hesitancy among patients, their parents, and health professionals who may be concerned about the risk of a recurrence following re-immunization. There is limited evidence to inform the management of these patients.
- The Canadian Special Immunization Clinic (SIC) Network was established in 2013 at 12 sites in six Canadian provinces to standardize and improve the management of patients with AEFIs and to determine the risk of recurrence following re-immunization.
- Infectious disease physicians and allergists developed standard protocols for evaluation, re-immunization, and follow up of patients with previous AEFIs.

Objective

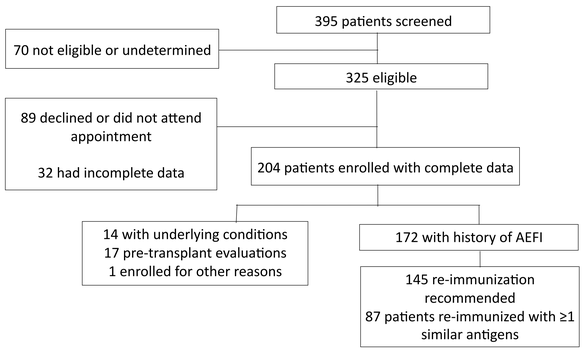
- To analyze the characteristics and outcomes of patients with previous AEFIs who were evaluated and re-immunized in the SIC network between 2015 and 2017.

Methods

- SIC physicians see adults and children with previous AEFI who are referred by a clinician or Public Health.
- Inclusion criteria are: injection site reaction ≥10 cm, allergic-like events <24h post-immunization, neurological symptoms, and other AEFI of concern.
- Eligible patients undergo a standardized evaluation. Expert physicians perform a causality assessment and make immunization recommendations. Patients are re-immunized in the SIC where possible and followed up after re-immunization to capture AEFI recurrence.
- Recommendations are transmitted to referring providers and Public Health. Following individual consent, data are transferred to a central database for analysis.
- Descriptive analysis was performed using SAS version 9.4. If ≥1 AEFI was reported, the most severe event was included.
- Ethics approval was obtained by the Research Ethics Boards at all study sites.

Results

Figure 1. Summary of participants screened and enrolled (2015–2017).



Of 172 participants with AEFIs, 51% were male, 40% were <2 years of age, 24% were 2–6 years of age, 26% were 7–17 years of age and 10% were ≥18 years of age.

Figure 2. AEFI types and temporally associated vaccines.

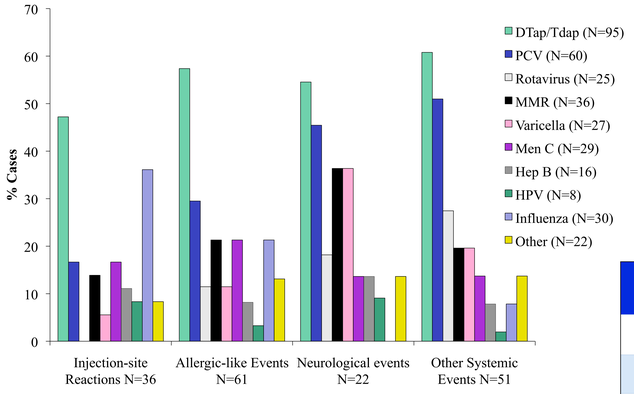


Figure 2. Allergic-like events and injection site reactions were the most common reasons for referral to a SIC. AEFI types are based on the final diagnosis among participants with complete data (N=172). Other AEFI include hypotonic hyporesponsive episodes, persistent crying, thrombocytopenia, fever. Other vaccines include hepatitis A/B, Td, yellow fever, typhoid. DTap/Tdap, diphtheria-tetanus-pertussis; PCV, pneumococcal conjugate vaccine; MMR, measles-mumps-rubella; MenC, meningococcal conjugate vaccine; HPV, human papillomavirus vaccine

Figure 3. Severity of Primary AEFI by AEFI type.

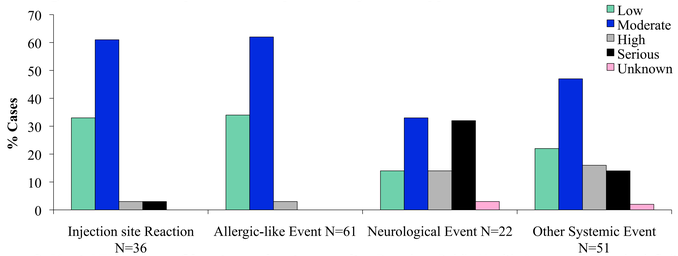


Figure 3. Most AEFIs were of low to moderate severity. Based on Public Health Agency of Canada definitions, low severity events are managed by telephone or cause <24 hours of disability. Moderate severity events require an unscheduled physician visit or lead to 1-3 days of disability. High severity events prevent daily activities, require >2 physician assessments or cause 4-14 days of disability. Serious AEFIs are life-threatening, lead to hospitalization >24 hours, permanent disability or death.

Figure 4. Re-immunization recommendations by AEFI type.

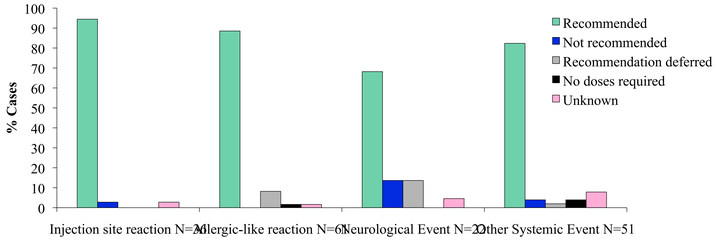


Figure 4. Re-immunization was recommended for 84% of patients. Re-immunization was not recommended for 6 patients. Re-immunization recommendations were deferred in 9 patients pending subspecialist referral or re-evaluation at a later date.

Table 1. Re-immunization status and outcomes by AEFI type.

AEFI type	Re-immunization with similar antigen	Any AEFI	Same AEFI	Impact on daily activities	Severity relative to first event
Injection site reaction	21	8	5	No effect (4) Limited activities (1)	Less severe (4) Same severity (1)
Allergic-like event	38	4	1	Unknown (1)	Less severe (1)
Neurological event	8	4	1	Limited activities (1)	Same severity (1)
Other systemic event	20	5	0	-	-
Total	87	**21 (25%)**	**7 (8%)**	-	-

Discussion

- Allergic-like events and injection site reactions were the most common reasons for referral.
- The risk of AEFI recurrence is low, and recurrences are generally less severe than the initial AEFI.
- **Limitations**: There is likely referral bias toward more severe AEFIs and allergic events.
  - Patients who were enrolled may differ from those who refused the appointment or declined enrollment, limiting generalizability.
  - Co-administration of vaccines complicated assessment of the "true" recurrence risk.
  - Few patients with serious AEFIs were referred.

Conclusions

- The occurrence of an AEFI is rarely a contraindication to future immunization.
- Patients with non-serious AEFIs can be reassured about the low risk of recurrence upon re-immunization.
- Specialized immunization services can support health professionals in managing patients with prior AEFIs.

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