Shoulder Injury Related to Vaccine Administration (SIRVA)

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SIRVA – what you will get out of this session

- SIRVA – what is it?
- Overview of cases reported to SAEFVIC
- Impact/implications
- How to avoid it
- Future
SIRVA – what is it?

- Suspected inadvertent delivery of vaccine into the shoulder joint +/- surrounding structures
- Associated diagnosis of bursitis on clinical assessment or medical imaging
- Bursitis likely related to vaccine components – adjuvants/antigens causing an inflammatory response
- Structural changes likely due to mechanical trauma from the needle
- Shoulder injury likely due to poor injection technique/individuals anatomy
Definition of SIRVA – SAEFVIC coding

- Rapid onset of shoulder pain - <48 hours
- Pain on movement
- Restriction of movement in the affected limb/joint
- Abnormalities on medical imaging
- Suspicion of incorrect vaccine administration technique
Reported cases of SIRVA by year

Year: 2007 - 2019
Number of cases: 0 - 30
Clinically confirmed SIRVA on ultrasound

Of the 67 reports of SIRVA made to SAEFVIC;

- 33 of 67 (50%) reported cases had a clinical diagnosis of Bursitis on ultrasound/radiological imaging
- 6 of the 33 cases were also diagnosed with impingement syndrome
- 3 of the 33 cases were also diagnosed with tendonitis
- 2 of the 33 cases were also diagnosed with supraspinatus tear
Symptoms of SIRVA +/- diagnosis of bursitis on imaging

Cases reported some or all of the following symptoms;

- Rapid onset of pain in shoulder of immunised arm
- Pain with certain movements – abduction/adduction
- Restricted movement of shoulder
- Unable to carry out activities of daily living ie; hanging out washing, driving, dressing
## Timing of symptom onset after vaccine administration

<table>
<thead>
<tr>
<th>Onset of symptoms</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immediate</td>
<td>29</td>
</tr>
<tr>
<td>&gt;immediate ≤24 hours</td>
<td>28</td>
</tr>
<tr>
<td>&gt;24 hours ≤48 hours</td>
<td>6</td>
</tr>
<tr>
<td>&gt;48 hours</td>
<td>2</td>
</tr>
</tbody>
</table>

Although 2 cases reported onset of symptoms >48 hours they still fit within clinical definition of SIRVA

| Unknown                   | 2     |
## SIRVA cases by vaccine type

<table>
<thead>
<tr>
<th>Vaccine type</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Influenza</td>
<td>41</td>
</tr>
<tr>
<td>dTpa</td>
<td>17</td>
</tr>
<tr>
<td>Pneumovax</td>
<td>5</td>
</tr>
<tr>
<td>Meningococcal B</td>
<td>4</td>
</tr>
<tr>
<td>Human Papilloma Virus</td>
<td>3</td>
</tr>
<tr>
<td>Meningococcal ACWY</td>
<td>1</td>
</tr>
</tbody>
</table>

*note some cases received more than 1 vaccine at the visit eg; Influenza +/- dTpa/Pneumovax

![SIRVA by vaccine type](chart.png)
# SIRVA cases by provider

<table>
<thead>
<tr>
<th>Provider type</th>
<th>Cases</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>GP</td>
<td>24</td>
<td>36%</td>
</tr>
<tr>
<td>Hospital – nurse/staff health/doctor</td>
<td>18</td>
<td>27%</td>
</tr>
<tr>
<td>Council Nurse</td>
<td>10</td>
<td>15%</td>
</tr>
<tr>
<td>Practice nurse</td>
<td>6</td>
<td>9%</td>
</tr>
<tr>
<td>Pharmacist</td>
<td>5</td>
<td>7%</td>
</tr>
<tr>
<td>Other/unknown</td>
<td>4</td>
<td>6%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>67</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>
SIRVA versus overall AEFI reports by provider type

Proportion of reports received by vaccine provider type

[Bar chart showing the proportion of reports received by different provider types, with categories including Unknown, Community Clinic, Council, GP, Hospital, Interstate/Overseas, Other, Pharmacy, and Workplace. The chart compares reports and SIRVA% across these categories.]
Management of SIRVA cases

Specialist
- GP
- Emergency department
- Orthopaedic/sports physician
- Rheumatologist
- Physiotherapy/myotherapy

Treatment
- Over the counter anti-inflammatories - NSAIDS
- Prescription pain relief – Voltaren, Endone, Panadeine forte,
- U/S guided cortisone injections
- Hydrodilation of the shoulder
Impact of SIRVA

- Difficulty performing ADL’s – dressing, cleaning, driving, hanging out washing, driving, dressing
- Difficulty sleeping due to pain
- Time off work/school
- Unable to participate in sporting activities/championships
- Compensation
Implications of SIRVA

- Vaccine hesitancy
- Immunogenicity of vaccine given - ?immunogenic if given into shoulder joint as opposed to deltoid muscle
- Consumer confidence in health care providers
- Cost of treatments
- Emotional and mental impact on vaccinee and families
Shoulder Injury Relating to Vaccine Administration (SIRVA)

To avoid causing a shoulder injury related to vaccine administration:

- Ensure you can visualise the deltoid from the shoulder to the elbow
- Be familiar with the anatomical landmarks and surrounding structures
- Follow recommended immunisation administration techniques
- Aim for the middle of the deltoid
- Do NOT inject too high or too low

For appropriate assessment, diagnosis and management report any suspected cases of SIRVA to SAEFVIC (Vic only) online at www.saefvic.org.au or by phone 1300 882 924 (Option 1).
Shoulder Injury Relating to Vaccine Administration (SIRVA)

To locate the deltoid site for injection:

- Expose the arm completely, from the top of the shoulder to the elbow; remove the shirt/clothing if needed.
- Locate the shoulder tip (acromion) and the muscle insertion at the middle of the humerus (deltoid tuberosity).
- Draw an imaginary inverted triangle below the shoulder tip, using the identified anatomical markers.
- The deltoid site for injection is halfway between the acromion and the deltoid tuberosity, in the middle of the muscle (triangle).
- More than 1 vaccine may be given into the deltoid muscle ensuring the deltoid mass is adequate and each vaccine is separated by 2.5cm.
Injection technique

Too high!

Too low!
Locating correct anatomical landmarks

Injection technique: CORRECT!
What have we done to prevent further cases?

- Australian Immunisation Handbook - Avoiding shoulder injury related to vaccine administration
Shoulder Injury Related to Vaccine Administration (SIRVA) describes a complication of incorrect vaccine administration whereby the vaccine is injected too high in the upper arm, causing pain and limited range of movement. Symptoms are usually immediate and can last for days or as long as years. Common diagnoses include tendon and ligament damage, bursitis, and impingement syndrome.
Shoulder injury related to vaccine administration

Administration of injected vaccines – correct technique

Shoulder Injury Related to Vaccine Administration

What have we done to prevent further cases?
SIRVA where to from here?

• SIRVA is described in literature however no clear definition has been formulated

• Publication: SAEFVIC proposing 2 papers;
  • 1 - Descriptive – intro/methods/results/discussion with the aim for the end point to be case definition (SAEFVIC coding and look to formalise with Brighton Collaboration definition)
  • 2 – Long term follow up – individual cases, legal and clinical issues, vaccine safety surveillance
Take home message

Know your site and get it right!