

Shoulder Injury Related to Vaccine Administration (SIRVA): Are you on Target? – A SAEFVIC Case Series

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Background

Shoulder pain can be described as a transient side effect of vaccine administration. In some cases, acute onset of shoulder pain and limited range of movement may suggest local injury to structures within the shoulder joint.

Shoulder Injury related to Vaccine Administration (SIRVA) has been described in literature as a rare complication of incorrect vaccine administration causing an immune-mediated inflammatory reaction locally within the shoulder joint (1, 2, 3)

SIRVA described in the literature includes: bursitis, tendonitis, rotator cuff tears and fluid accumulation in the deltoid or rotator cuff. Bursitis of the shoulder joint is one of the most common clinically reported diagnosis, usually confirmed by ultrasound.

Definition of Bursitis – Bursae are small fluid filled sacs located between 2 adjoining structures that aid in reducing friction and assist in movement of tendons over bony surfaces. Inflammation of the bursae, called bursitis, can cause localised pain, pain worsened by movement, stiffness and increased pain at night.

SAEFVIC (Surveillance of Adverse Events Following Vaccination in the Community) collect, analyse and report information about significant Adverse Events Following Immunisation (AEFI) as part of monitoring vaccine safety in Victoria.

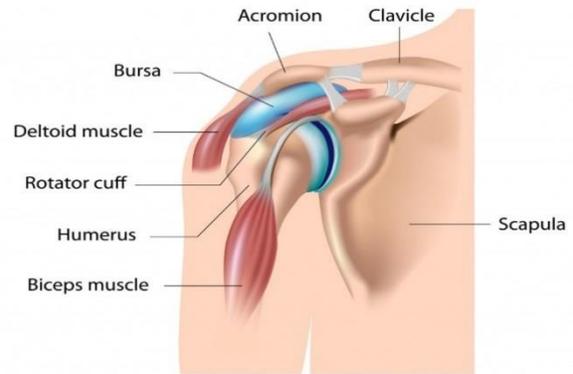
We reviewed the SAEFVIC database for cases of confirmed Bursitis reported to SAEFVIC. Data was extracted from the SAEFVIC Database (2007-2017).

Diagnostic criteria for Bursitis – Clinically diagnosed on ultrasound or by relevant health practitioner i.e. Physiotherapist or GP.

Case Series (4 of 17 confirmed Bursitis/SIRVA cases reported to SAEFVIC 2007-2017)

CASE	Vaccine	Onset of symptoms	Investigation & diagnosis	Management	Outcome
1	HPV	6 hrs – injection site noted to be high with >10days shoulder pain	Ultrasound confirmed impingement syndrome and subacromial bursitis	GP follow up Physio	Unknown
2	dTpa (Boostrix)	Pain immediately after injection which increased over 10 days	Ultrasound confirmed subacromial bursitis	ED visit – Ketorolac injection/Endone Cortisone injections and hydro-dilatation Sports physician Anti-inflammatory	Symptoms lasted >4 weeks
3	Influenza (FluQuadri)	Immediate pain. Reports nurse had trouble pushing vaccine into muscle very high in arm. Difficulty lifting arm and decreased range of motion	Ultrasound confirmed bursitis	GP Physiotherapy Anti-inflammatory medications	Symptoms lasted >4 weeks Time off work
4	Menitorix (scheduled 12 month dose)	5 days post 12 month vaccines child could not elevate or use right arm with decreased ROM	Treated as osteomyelitis in hospital. Ultrasound confirmed showed small joint effusion MRI showed subacromial/sub deltoid bursitis with overlying deltoid myositis and tendinosis	Local emergency department Tertiary hospital admission Ultrasound Bone scan MRI Orthopaedics Infectious disease PICC line for AB's	Pain lasted >3 weeks

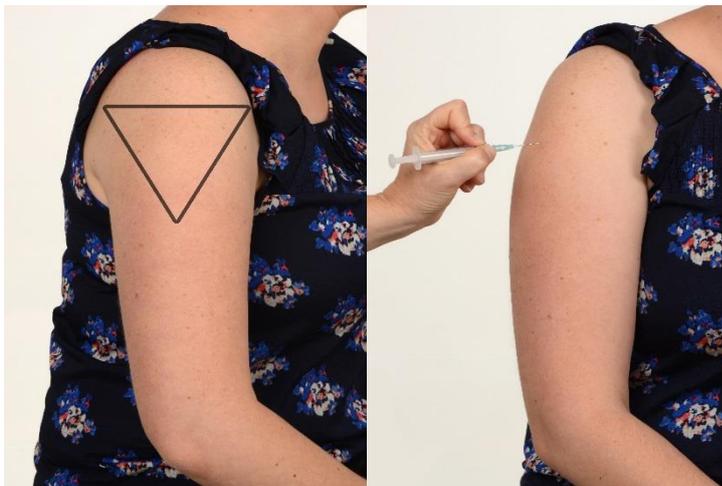
This review highlights the importance of educating immunisation providers on correct vaccine administration and ensuring the upper arm is exposed to ensure landmarks are visible.



Injection technique: TOO HIGH



Injection technique: TOO LOW



Injection technique: CORRECT!

Recommended vaccine administration techniques: Are you on Target?

- As per the Australian Immunisation Handbook 4
- Children ≥ 12 months of age, adolescents and adults
- 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.

Take home messages

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).

References

1. Atanasoff S, Ryan T, Lightfoot R, Johan-Liang R. Shoulder injury related to vaccine administration (SIRVA). *Vaccine*. 2010 ;(51):8049-8052.
2. Bodor M, Montalvo E. Vaccination-related shoulder dysfunction. *Vaccine*.2007;25(4):585-587.
3. Cook IF. An evidence based protocol for the prevention of upper arm injury related to vaccine administration (UAIRVA). *Human Vaccines*. 2011; 7(8):845-848.
4. [The Australian Immunisation Handbook 10th Edition 2013:81-84](#)