**Supplemental Table 2.** Demographic characteristics and outcomes of interest of included database case series and retrospective comparative studies

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| Study | Incidence | Age in years | Proportion of women | BMI  | Vaccine | Injection site | Onset | Timing of initial presentation | Signs and symptoms | Imaging | Diagnosis | Management | Clinical course oroutcome |
| Database case series |
| Atanasoff et al. [2] | NR; 13 cases | Mean 50 (range, 26-83) | 11 of 13 | Mean 27.2 (range, 19.4-41.3) | Influenza: 8 (62%)Td: 2 (15%)Tdap: 2 (15%) | Too high: 6 (46%) | Immediate: 7 (54%)Within 24 hours: 5 (39%)Within 4 days: 1 (8%) | NR | Shoulder pain: 13 (100%)Limited ROM: 11 (85%)Altered sensation: 4 (41%)  | Radiographs: 7 (54%), no diagnostic benefitMRI: 9 (69%), fluid collections in deep deltoid/overlying tendons, fluid in bursa, tendonitis, tears | NR | NSAIDs: 8 (62%)Steroid injection: 8 (62%)PT: 6 (46%)Surgery: 4 (31%) | Symptoms for ≥ 6 months in all patientsFull recovery: 4 (31%)Residual symptoms: 9 (69%) |
| Martín Arias et al. [31] | 0.06% (eight of 13,717 spontaneous notification in the FEDRA database related to immunizations) | 56 (38-83) | 5/8 | NR | Influenza: 6 (75%)PPV: 1 (13%)Td: 1 (13%) | NR | ≤ 1 day: 3 (38%) | NR | Shoulder pain | NR | Bursitis: 3 (38%)Subacromial or subdeltoid bursitis: 2 (25%)Tenosynovitis: 1 (13%)Focal tendinosis and bursitis: 1 (13%)Tendonitis: 1 (13%) | NR | NR |
| Shimabukuro (2018)[41] | 2.0% (1006 of 50,247) of all IIV reports to VAERS during study period involved shoulder dysfunction (range, 1.5% to 2.4% per influenza season) | 51 (14-94) | 829 of 1006 (82%) | NR | Influenza | Too high on arm: 177 (79.7% of 222 total reports) | Same day: 755 (75%) | NR | Shoulder pain: 442 (44%)Decreased limb mobility: 407 (41%)Decreased joint ROM: 191 (19%) | NR | Bursitis: 94 (9%)Arthralgia 92 (9%)Rotator cuff syndrome: 90 (9%)Adhesive capsulitis: 57 (6%)  | Surgery: seven of 65 serious cases (11%) | Pain unresolved at time of report: 859 (85%) |
| Hibbs et al. [22] | 2.0% of all IIV reports to VAERS during study period involved atypical shoulder pain (range, 1.5% to 2.5% per influenza season) | 52 (16-94) | 1008 of 1220 (82.6%) | NR | Influenza | Too high on the arm: 216 (17.7%) | All < 48 hours; 70.7% same day | NR | Most common:Shoulder pain: 538 (44.1%) Decreased injected limb mobility: 498 (40.8%) Decreased ROM: 259 (21.2%)Rotator cuff syndrome: 112 (9.2%)Bursitis: 110 (9.0%)  | NR | Among 11 hospitalized individuals:Shoulder pain: 3 (27%)Adhesive capsulitis: 3 (24%)Rotator cuff tear: 2 (18%)Bursitis: 1 (6%)Impingement syndrome of the shoulder: 1 (6%)Shoulder pain with strained muscle of rotator cuff: 1 (6%) | Among 546 reported:Non-narcotic analgesics: 254 (46.5%)PT: 215 (39.3%)Corticosteroid injection: 109 (20.0%)Surgery: 16 (2.9%) | Symptom resolution: 50 (4.1%) Median duration to recovery: 70 days (range 18– 365 days).Residual symptoms: 1057 (86.6%)No statement of whether symptoms resolved: 113 (9.2%) |
| Hesse et al. [19] | 2.5% of total VICP petitioner claims in 2011 to 41.9% in 2016 | 51 (16-92) | 394 or 476 (82.8%) | 25.1 (17.0-48.9) | Influenza: 400 (84.0%)Tdap: 57 (12.0%)Pneumococcal conjugate: 11 (2.3%)Td: 6 (1.3%)Other: 11 (2.2%) | Too high on the arm: 172 (75.8%)  | Same day: 327 (68.7%)Day after: 43 (13.1%) | Median 15 days (0–970)  | Most common:Shoulder pain: 447 (93.9%)Tenderness: (56.9%)Limited ROM: 266 (55.9%)Impingement: 47 (9.9%) | MRI: 384 (80.7%); tendonitis, tendinosis, or ‘tendinopathy (189; 49.2%), complete or partial rotator cuff tears (170; 44.3%), bursitis (132; 34.3%), normal (21; 5.5%) | Shoulder pain: 152 (31.9%)Rotator cuff problems: 66 (13.9%)Bursitis: 56 (11.8%)Local reaction: 39 (8.2%)Adhesive capsulitis: 26 (5.5%)Adverse effects of vaccination: 12 (2.5%)Neuritis: 11 (2.3%)Impingement: 9 (1.9%)Other: 46 (9.7%)Unspecified: 88 (18.5%) | PT or OT: 381 (80.0%)Steroid injections: 286 (60.1%)NSAIDs or other analgesics: 240 (50.4%)Surgery: 155 (32.6%)Oral steroids: 130 (27.3%) | Resolution of symptoms: 116 (24.3%)  |
| Comparative studies |
| Hesse et al. [20] | 0.0005% (16 of 2,943,493)  | Risk interval: 57.5 (24-98)Control interval: 60 (31-87) | Risk interval: 11 of 16Control interval: 25 of 51  | Risk interval: 28.1 (17.0-51.7) Control interval: 30.2 (22.2-56.4) | Influenza | Too high: 1/16 (6%) | Risk interval: 0-2 daysControl interval: 30-60 days | Risk interval: 21 days (range 3-144 days)Control interval: median 22 days (range 0-123 days)  | NR | Four patients with definite bursitis had findings of bursitis on MRI at 11, 101, 167, and 217 days after vaccination | Subdeltoid bursitis | Among six patients with definite cases in risk interval: Surgery: 4 (66%)Corticosteroid injection: 1 (17%) | Resolution of symptoms: 2 of 16 in risk interval (12.5%), 5/51 control patients (9.8%) |
| Gonzalez et al. [18] | Pre-vaccination: 52 of 4801 (1.1%)Post-vaccination: 40 of 3977 (1.0%) | Overall: 21 (20-26) | Overall: 39 of 92 (66%) | NR | Influenza | NR | NR | Pre-vaccination: within 3 monthsPost-vaccination: 3 to 6 months | NR | NR | Pre-vaccination: Atraumatic shoulder pain: 33 (44%)Other shoulder injury: 33 (5%)Fracture or dislocation: 38 (8%)Post-vaccination:Atraumatic shoulder pain: 22 (29%)Other shoulder injury: 20 (3%)Fracture or dislocation: 38 (8%) | NR | NR |
| Hirsiger et al. [23] | NR; 16 patients, 14 controls | Cohort: 24 (IQR: 21-25)Controls: 35.5 (IQR: 25-40) | Cohort: 13 of 16Controls: 10 fo 14 | Cohort: 21.3 (IQR 20-22.3)Controls: 21.4 (IQR 19.5-25) | Influenza | Too high: five of 16 patients (31%) | Within 24 hours: 15 of 16 patients (94%) | < 72 h: 0/ of 6< 1 month: 3 of 161-3 months: four of 16> 3 months: seven of 16 | Shoulder pain | US: bursitis of the subacromial or subdeltoid bursae (n = 4), tendinitis of the supraspinatus, infraspinatus, or biceps tendons (n = 3), erosions (n = 16), typically at the insertion of the tendon of the supra- or infraspinatus muscle MRI: enthesitis with contrast-media uptake in direct association with the erosions, indicating active inflammation (n = 16)  | Chronic inflammation and extracellular matrix-specific autoimmunity  | Topical NSAIDs: 2 (13%)Systemic NSAIDs: 11 (69%)Cortisone injection: 5 (31%)Systemic cortisone: 4 (25%)PT: 6 (38%) | 12 months post-vaccination: full recovery: nine of 16; intermittent pain: seven of 16  |

Age and BMI are presented as the median (range) unless stated otherwise. FEDRA = Adverse Reaction Data of the Spanish Pharmacovigilance System; VAERS = Vaccine Adverse Event Reporting System; VICP = Vaccine Injury Compensation Program; NR = not reported; IIV = inactivated influenza vaccine; PPV = 23-valent pneumococcal polysaccharide vaccine; Td = diphtheria, tetanus toxoid vaccine; Tdap = tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis vaccine; PT = physical therapy.