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Onset of Frozen Shoulder Following Pneumococcal and Influenza Vaccinations

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Abstract

Objective: Adhesive capsulitis has been suggested as an adverse effect of vaccine administration into the shoulder area. The purpose of this case series is to report 3 cases of acute onset of adhesive capsulitis following pneumococcal and influenza vaccines.

Clinical Features: Patients reported painful shoulder and limited motion following routine vaccination. After clinical examination, a diagnosis of adhesive capsulitis was noted.

Intervention and Outcome: All 3 patients were treated conservatively with physical therapy (active ranges of motion and active-assisted motion), nonsteroidal anti-inflammatory drugs, and activity modification with eventual resolution of symptoms.

Conclusion: Reports implicating vaccination with adhesive capsulitis are rare. This case series raises the awareness of pneumococcal and influenza vaccinations as possible causes of adhesive capsulitis that appear to respond to standard treatment. Although vaccines are of tremendous importance in the prevention of serious illness, we emphasize the importance of administering them at the appropriate depth and location for each patient.

Introduction

The pneumococcal and influenza vaccines are usually given as single injections for 70% of the US adult population.[1,2] They are frequently injected intramuscularly in the deltoid muscle.[1] There are guidelines set for the depth of the needle to be used. According to Current Centers for Disease Control and Prevention, a needle length ranging from 5/8 to 1 inch and 1 1½ inches is suitable for adult patients weighing <152 and >152 lb, respectively. These guidelines aim to allow the vaccine contents to reach the muscle but not the underlying shoulder tissues.[3] The side-effects of these vaccines commonly include allergic reactions, fever, local soreness, and/or rash.[1] This paper presents three cases of shoulder stiffness with limited range of motion (ROM) that arose one day after the vaccines were administered.

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Case Reports

Case 1

A healthy 67-year-old man presented with non-dominant right shoulder and upper arm pain of 3 months duration. He reports having had a pneumococcal vaccine and experienced severe arm pain the following day with markedly decreased range of motion. He reported that his ability to perform overhead activities was severely compromised. He also described a sense of weakness in his arm. His efforts to restore arm mobility by means of stretching and usage of the arm were not successful. He is a golf player but denied any previous trauma, injury, or excessive use, and his medications included simvastatin, iron, and one adult aspirin daily.

He visited his family physician who noted he was incapable of elevating his arm past 90° and had positive signs of impingement. The rest of the motor and neurologic exam was negative so he was diagnosed with right shoulder impingement syndrome for which he was given a subacromial cortisone injection containing 2 mL of Kenalog 40 mg and 6 mL of bupivacaine 0.5%. The patient was instructed to ice the shoulder frequently. His range of motion improved, but the pain persisted over the following 5 to 6 days. It seemed to be deep-seated and localized to the deltoid muscle. A magnetic resonance imaging (MRI) of the right shoulder without contrast was then ordered, which revealed mild acromioclavicular (AC) joint arthropathy and rotator cuff tendinopathy. Subsequently, he was referred to an orthopedic surgeon.

Upon presenting to the senior author, the physical exam revealed that there was no atrophy around the shoulder girdle. Abduction was painful at 60° to 80°. His range of motion with forward flexion was good with 5/5 rotator cuff strength with Jobe test, belly press, and bear hug. He had a negative O'Brien test and a positive Hawkins test. Shoulder radiographs demonstrated some degenerative changes of the AC and glenohumeral joints, no proximal humeral head migration, and no calcifications or osseous abnormalities. He was prescribed 4 weeks of rehabilitation treatments to attempt to improve his range of motion and pain.

At his follow-up appointment one month later, physical examination revealed increased weakness in rotator cuff strength (4/5) with Jobe test; however, he was able to flex forward to 155° and externally rotate to 80°. The source of his pain was localized to the lateral deltoid region where he was injected with the vaccine. An MRI without contrast showed no rotator cuff tear. Six weeks later, it was noted that his shoulder mobility was improving but the pain continued to persist. He continued physical therapy for six more weeks along with non-steroidal anti-inflammatory drugs (NSAIDs). After 50 days, he regained full mobility with full range of motion and rotator cuff strength (5/5). He was pain free, and resumed playing golf with no further limitations 20 months post injection.

Case 2

A previously healthy 30 year-old man presented with non-dominant left shoulder pain of approximately two years duration. According to the patient, the pain apparently began soon after receiving an influenza vaccine. Initially, he had trouble sleeping and felt sharp pain in the posterior subacromial region whenever he brought his arm up behind his head and tried to relax his elbow back. This pain was accompanied with a decrease in his range of motion, but this did improve over a period of several months.

Upon presenting to the senior author, physical exam revealed good range of motion in forward flexion and abduction (150° and 160°, respectively) but limited internal rotation (45°) and external rotation (50°). He had a negative O'Brien test and mild to moderate pain with Hawkins maneuver. There was no pain with cross chest adduction or over the AC joint. He had 5/5 strength with Jobe test, resistive external rotation, belly-press, and bear-hug test. There was no atrophy around the deltoid or shoulder girdle, and there was no scapular winging. A radiograph of the shoulder showed that he had a type II acromion with no joint abnormalities, no proximal migration of the humeral head, and no gross bony abnormalities. Clinical work-up for infection was negative.

Because his pain and stiffness had been improving with time, it was decided that expectant management would be the course of action. The senior author recommended activity modification and NSAIDs along with rotator cuff strengthening program. He also recommended a cortisone injection (by a 1-in needle which was appropriate for his body weight) and symptomatic treatment with possible need for shoulder arthroscopy if no improvement was noticed. At this time, the patient has no limitations with his activities of daily living except for very low-grade pain with activity.