Acute brachial neuritis following influenza vaccination

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SUMMARY

Brachial neuritis following vaccination is an uncommon but clinically important presentation of severe shoulder and arm pain associated with globally reduced range of movement. It may be confused with the more common diagnoses of rotator cuff pathology, adhesive capsulitis (frozen shoulder), shoulder arthritis or cervical spondylosis. We present a case of acute brachial neuritis, which posed a clinical diagnostic challenge to emergency, acute medical and rheumatology clinicians.

BACKGROUND

At present, a causal association of acute brachial neuritis postinfluenza vaccination is only suggested by a few multicentre and multinational case reports. Hence, our case lends weight to this theory. It additionally highlights the need for awareness of this rare potential neurological complication of influenza vaccination given the increased drive for vaccination in recent years: influenza vaccination of individuals with common immunosuppressive comorbidities, or those on immunosuppressive therapies, is widely recommended and hence common practice in primary and secondary care.

CASE PRESENTATION

A normally fit and well 46-year-old Caucasian woman, with neither significant medication nor family medical history, presented to our accident and emergency department with a month's history of severe left shoulder pain. The onset was acute, developing a few days after an influenza vaccination in the left deltoid muscle. Within a week of the onset of pain, she developed left-upper-limb weakness with difficulty in performing her usual activities. On examination, there was left-arm weakness of power of 1/5 on the Medical Research Council grading scale and painfully reduced range of movement of the left shoulder in all directions.

INVESTIGATIONS

An ultrasound scan of her shoulder did not reveal any of the more common differential diagnoses of shoulder joint arthritis, adhesive capsulitis, calcific tendinitis, rotator cuff muscle or tendon tears or tendinopathy. A cervical spine MRI was also normal, excluding cervical radiculopathy or myelopathy. Finally, upper limb nerve conduction studies and electromyography revealed severe axonal denervation of the left deltoid and supraspinatus muscles with mild involvement of the infraspinatus muscle and evidence of reinnervation.

DIFFERENTIAL DIAGNOSIS

The common causes of shoulder pain that might account for this patient's presentation are listed above and can be differentiated using a combination of imaging modalities. In the presence of shoulder and upper arm weakness, nerve root compression, spinal cord or brachial plexus tumours and motor neurone disease should also be considered. However, acute shoulder pain in the absence of trauma along with a normal clinical examination of the shoulder joint should alert the clinician to the diagnosis of brachial neuritis over other conditions.

TREATMENT

She was diagnosed with postvaccination acute brachial neuritis and treated with 40 mg of prednisolone once daily for a week, followed by a reducing course. She was additionally prescribed amitriptyline and underwent physiotherapy.

OUTCOME AND FOLLOW-UP

Four months after her initial presentation, the pain had improved but there was mild residual global weakness of left shoulder movement. 8 months later, the pain had resolved completely but mild weakness persisted.

DISCUSSION

Brachial neuritis (neuralgic amyotrophy or Parsonage-Turner syndrome) is an uncommon cause of shoulder pain that is often misdiagnosed.¹ It was first described in 1943 by Spillane in 46 patients with 'Localised neuritis of the shoulder girdle', followed in 1948 by Parsonage and Turner. Neurological complications of influenza vaccination were first recognised in 1976 following mass immunisation, which resulted in a sevenfold increase in the incidence of Guillain-Barre syndrome.² Other reported neurological complications include optic neuritis, peripheral polyneuropathy and isolated hypoglossal nerve paralysis. Brachial neuritis after administration of an influenza vaccination has previously been reported in three publications although the exact incidence is not known.^{1 3 4}

The annual incidence of acute brachial neuritis in the UK is 3 cases per 100 000.⁵ Most cases occur between 20 and 60 years of age, although it has been reported in all ages. There is a male predominance with a male-to-female ratio between 2:1 and 4:1. It can be idiopathic or inherited. The inherited form is autosomal dominant and has been linked to mutations in the SEPT9 gene on chromosome 17q coding septins.⁶

The aetiology of brachial neuritis is unclear but is thought to be an immune-mediated inflammatory reaction against brachial plexus nerve fibres

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involving complement, antiperipheral nerve myelin antibodies and T cells.^{7 8} There is predominantly an axonal neuropathy with Wallerian degeneration.

Typically, there is a sudden onset of severe burning pain around the affected shoulder and upper arm. After days or weeks, this is replaced by flaccid muscle weakness.¹ Hence, the temporal pattern in our patient, of pain followed by weakness, is classic of brachial neuritis. Weakness most commonly affects the supraspinatus, infraspinatus, deltoid and occasionally biceps muscles. Isolated nerve involvement has been reported, and rarely, phrenic nerve involvement leads to dyspnoea.^{2 3}

Although there are no randomised-controlled trials, anecdotal evidence suggests that steroids used early in the disease course limit the painful phase of illness but do not affect long-term prognosis.⁹ Thus, current treatment involves a combination of steroids, analgesics and physiotherapy.

In most cases, there is improvement and recovery of muscle strength over the course of 3–4 months. In one case series, 89% of patients showed complete resolution at 3 years.¹⁰ However, weakness may persist for several years before recovery and some patients unfortunately experience permanent weakness.¹

Learning points

- ▶ Acute brachial neuritis is a rare but important differential cause of severe shoulder pain with reduced range of movement or upper limb weakness.
- ▶ It may be a complication of influenza vaccination although its incidence is unknown and currently there is insufficient evidence to accept (or reject) an association.
- ▶ Diagnosis is made by nerve conduction studies and exclusion of the differentials of rotator cuff pathology, calcific tendinitis, adhesive capsulitis and cervical spondylosis.
- ▶ Treatment is anecdotal, with steroids, neuropathic analgesia and physiotherapy.
- ▶ Recovery occurs after 3 months, with complete resolution in 89% by 3 years, but it may result in permanent weakness.

Competing interests None.

Patient consent Obtained.

REFERENCES

- 1 Miller JD, Pruitt S, MacDonald TJ. Acute brachial plexus neuritis: an uncommon cause of shoulder pain. *Am Fam Physician* 2000;62:2067–72.
- 2 Poser CM. Neurological complications of swine influenza vaccination. *Acta Neurol Scand* 1982;66:413–31.
- 3 Wells CEC. A neurological note on vaccination against influenza. *BMJ* 1971;3:755–6.
- 4 Hansen O. Acute brachial neuropathy following influenza vaccination. *Ugeskr Laeger* 2005;167:1297–8.
- 5 MacDonald BK, Cockerell OC, Sander JW, et al. The incidence and lifetime prevalence of neurological disorders in a prospective community based study in the UK. *Brain* 2000;123(Pt 4):665–76.
- 6 Kuhlensbaumer G, Hannibal MC, Nelis E, et al. Mutations in SEPT9 cause hereditary neuralgic amyotrophy. *Nat Genet* 2005;37:1044–6.
- 7 Suarez GA, Giannini C, Bosch EP, et al. Immune brachial plexus neuropathy: suggestive evidence for an inflammatory-immune pathogenesis. *Neurology* 1996;46:559–61.
- 8 Vriesendorp FJ, Dmytrenko GS, Dietrich T, et al. Anti-peripheral nerve myelin antibodies and terminal activation products of complement in serum of patients with acute brachial plexus neuropathy. *Arch Neurol* 1993;50:1301–3.
- 9 van Eijk JJ, van Alfen N, Berrevoets M, et al. Evaluation of prednisone treatment in the acute phase of neuralgic amyotrophy: an observational study. *J Neurol Neurosurg Psychiatry* 2009;80:1120–4.
- 10 Tsairis P, Dyck PJ, Mulder DW. Natural history of brachial plexus neuropathy. Report on 99 patients. *Arch Neurol* 1972;27:109–17.

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