Inflammatory Myopathy Following Influenza Vaccination: A Case Report

S. Sirgiovanni[1], P.A. Bruno[1], P. Zoleo[1], M.P. Barillari[1], R. De Fiores[1], G. Gambardella[1], C.F. di Napoli[1], S. Barone[1], A. Gambardella[1], P. Valentino[1], M. Trimboli[1]

1 Institute of Neurology, Department of Medical and Surgical Sciences, University "Magna Graecia" of Catanzaro.

BACKGROUND

Inflammatory myopathies (IM) are a group of disorders characterized by muscle inflammation, proximal muscle weakness, increased serum muscle enzymes, and frequent multisystem involvement including the lungs, skin, and joints. Five major subtypes are recognized: dermatomyositis, immune-mediated necrotizing myopathy (IMNM), sporadic inclusion body myositis, overlap myositis, and polymyositis. Within each type, specific autoantibodies further divide patients into even more homogeneous subtypes [1]. Infectious agents and vaccinations have been postulated to trigger disease in genetically predisposed individuals [3]

CASE PRESENTATION

We present the case of a 75-years-old female patient with history of hypothyroidism, arterial hypertension, diabetes mellitus and hypercholesterolemia, who developed bilateral proximal lower limb weakness, gait impairment, and difficulty maintaining posture approximately 15 days after receiving influenza vaccine. She also experienced fatigability with prolonged arm elevation, affecting daily activities. She did not report any sensory abnormalities, sphincter dysfunction, or limb pain. Neurological examination revealed waddling gait, bilateral pronation on Mingazzini I, rapid arm drop on Mingazzini II, moderate hip flexor weakness (MRC grade 2/5) and mild weakness of shoulder girdle muscles (MRC grade 4/5) and diminished reflexes. Laboratory tests showed markedly elevated muscle enzymes (ALT, AST, CK, LDH) and mild C-reactive protein elevation. Electromyographic examination revealed positive sharp waves (PSWs) and fibrillation potentials, and early recruitment in proximal limb muscle, findings characteristic of a myopathic pattern and compatible with inflammatory myopathy [Figure 1-2-3]. Cardiac evaluation was normal, while spirometry indicated mild restrictive lung defect. The patient was treated with intravenous methylprednisolone (3.5 g total), resulting in clinical improvement at discharge, neurological examination showed normal Mingazzini I, slow bilateral drop on Mingazzini II and mild hip flexor weakness with otherwise preserved motor strength.

Figure 1

	Spontaneous Activity		Voluntary Activity					
Muscolo	Fib	PSW	Amp	Dur	Poly	Stabil	IP	Recruit
Sinistra Deltoideus post	4/10	4/10	Normal	Normal	Normal	Normal	Normal	Early
Destra Deltoideus post	4/10	4/10	Normal	Normal	Normal	Normal	Normal	Early
Destra Biceps	5/10	5/10	Normal	Normal	Normal	Normal	Normal	Early
Sinistra Biceps	5/10	5/10	Normal	Normal	Normal	Normal	Normal	Early
Sinistra Ext dig communis	0/10	0/10	Normal	Normal	Normal	Normal	Normal	Normal
Destra Ext dig communis	0/10	0/10	Normal	Normal	Normal	Normal	Normal	Normal
Destra Inteross dors I	0/10	0/10	Normal	Normal	Normal	Normal	Normal	Normal
Sinistra Inteross dors I	0/10	0/10	Normal	Normal	Normal	Normal	Normal	Normal
Destra Gastroc caput med	2/10	2/10	Normal	Normal	Normal	Normal	Normal	Normal
Sinistra Gastroc caput med	0/10	0/10	Normal	Normal	Normal	Normal	Normal	Normal
Sinistra Tibialis anterior	0/10	0/10	Normal	Normal	Normal	Normal	Normal	Normal
Destra Tibialis anterior	0/10	1/10	Normal	Normal	Normal	Normal	Normal	Normal
Destra Vastus med	4/10	4/10	Normal	Normal	Normal	Normal	Normal	Early
Sinistra Vastus med	3/10	3/10	Normal	Normal	Normal	Normal	Normal	Early

Figure 2

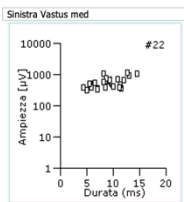
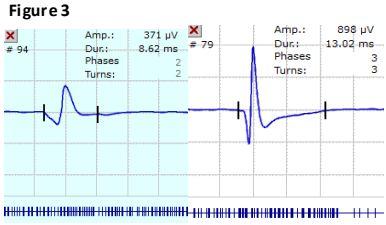


Figure 3



DISCUSSION

Although a muscle biopsy, considered the diagnostic gold standard, was not performed, the diagnosis of inflammatory myopathy was supported by clinical presentation, EMG findings and serological markers, in accordance with EULAR/ACR classification criteria [2]. There is currently no evidence linking vaccination with inactivated trivalent influenza vaccine to the onset of myositis. However, other case reports have suggested a possible association between myopathies and vaccination against hepatitis B virus, Mycobacterium tuberculosis, tetanus, smallpox, polio, and diphtheria, including the combined diphtheria-pertussis-tetanus vaccine [3]. A shared antigenic mimicry between vaccine components and myositis-specific antigens may underlie this potential immune-mediated mechanism. Despite the absence of reported inflammatory myopathy cases following influenza vaccination, the close temporal association between vaccination and symptom onset cannot exclude a causal association.

REFERENCE

1. Selva-O'Callaghan A, Pinal-Fernandez I, Trallero-Araguás E, Milisenda JC, Grau-Junyent JM, Mammen AL. Classification and management of adult inflammatory myopathies. *Lancet Neurol*. 2018;17(9):816-828. doi:10.1016/S1474-4422(18)30254-0
2. Lundberg IE, Tjärnlund A, Bottai M, et al. 2017 European League Against Rheumatism/American College of Rheumatology Classification Criteria for Adult and Juvenile Idiopathic Inflammatory Myopathies and Their Major Subgroups. *Arthritis Rheumatol*. 2017;69(12):2271-2282. doi:10.1002/art.40320
3. Limaye V, Smith C, Koszyca B, Blumbergs P, Otto S. Infections and vaccinations as possible triggers of inflammatory myopathies. *Muscle Nerve*. 2017;56(5):987-989. doi:10.1002/mus.25628