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I. Gracia-Darder*, N. Izquierdo, J. Boix-Vilanova, D. Ramos

Departamento de Dermatología, Hospital Universitario Son Espases, Palma de Mallorca, Baleares, Spain

* Corresponding author.
E-mail address: ines.gracia@ssib.es (I. Gracia-Darder).

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Contact allergy to aluminum following vaccination: A report of 3 cases☆

Alergia de contacto a aluminio tras vacunación: presentación de tres casos

Dear Editor:

Vaccination is an essential measure in preventive medicine. However, it is not free from complications, since it can lead to adverse reactions, although these are mainly mild, transient, and self-limiting[1]. The reactions are rarely persistent, with most cases involving a hypersensitivity reaction to aluminum[2,3].

We report the cases of 2 girls (age, 2 and 3 years) and a boy (8 years) who experienced persistent cutaneous reactions after vaccination (Table 1). All 3 patients developed nodules at the injection site, and in 1 case, the reaction was accompanied by eczema and hypertrichosis, which had first appeared more than 1 year previously (Fig. 1)[4]. The vaccinations had been administered according to the corresponding schedule, and the clinical picture was associated with the vaccines included in the schedule. Given that the clinical suspicion included other conditions in 2 cases, diagnosis was based on skin biopsy, which revealed findings typical of this type of reaction (histiocytes with granular cytoplasm) (Fig. 2). All 3 patients underwent patch testing with aluminum chloride 2% in petrolatum (Chemotechnique), which yielded positive readings at 72 and 168 hours (Fig. 3).

Figure 1 Lesions on the right thigh in the form of excoriated erythematous macules clustered over a nodular lesion with hypertrichosis on the surface.

Aluminum compounds have been used as adjuvants in vaccines for more than 80 years to boost the immune response to the antigen. Administration of vaccines can lead to cutaneous lesions, mostly in the form of pruritus or subcutaneous nodules; areas of hypertrichosis or eczema are less common. The reactions persist in 0.5%–6% of cases, mainly because of a type IV hypersensitivity reaction to aluminum hydroxide. Patch testing with aluminium hydroxide 2% is positive in 77%–95% of children with persistent reactions, thus demonstrating the presence of contact allergy to the metal[5].

Various histologic patterns have been described (panniculitis, pseudolymphomatous, granuloma annulare–like), although the characteristic finding is histiocytes with a granular cytoplasm. Nevertheless, given the high sensitivity of patch testing, skin biopsy is not considered essential for diagnosis[5,6].

Table 1 Summary of Cases of Contact Allergy to Aluminum.

Case	Age, y	Sex	Cutaneous Symptoms	Associated Vaccine	No. of Aluminum-Containing vaccines	Duration of Symptoms at the First Evaluation, mo
1	2	Female	Nodules, eczema, and hypertrichosis	PCV13	4	12
2	3	Female	Nodules	DTP, Hib	5	18
3	8	Male	Nodules	DTP	6	24

Abbreviations: DPT, diphtheria, pertussis, tetanus; Hib: *Haemophilus influenzae* b; PCV, pneumococcal conjugate vaccine.

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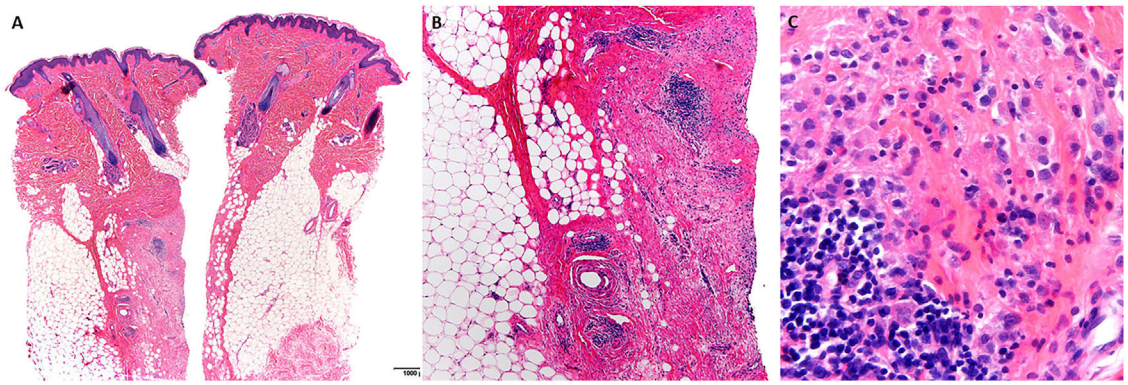

Figure 2 Skin biopsy from one of the case reports. A, Normal epidermis, with lesions mainly in the dermis and subcutaneous cellular tissue (hematoxylin-eosin, ×4). B, Areas of sclerosis, together with follicular lymphoid hyperplasia and histiocytic infiltrate (hematoxylin-eosin, ×4). C, Histiocytes with granular cytoplasm (hematoxylin-eosin, ×20).

Figure 3 Patch test readings at 168 h in one of the cases. Note the positive result to aluminum hydroxide 2% (++).

The lesions generally appear at 12–18 months of life, mostly after several vaccinations (usually after the third) and with subcutaneous vaccines. It is thought that, at the subcutaneous level, aluminum comes into contact with dendritic cells, thus triggering a hypersensitivity reaction. The reactions usually occur 2.5 months after the vaccination, although reports indicate that this interval can vary from 2 weeks to 13 months. The duration of symptoms also varies widely, from months to up to 10 years[5].

Children who are sensitized to aluminum can experience contact dermatitis when exposed to objects that contain it (e.g., deodorants, toothpaste, pigments used in tattoos). However, some studies show that contact allergy to aluminum can diminish or disappear over time, with negative results in up to 77% of cases 7 years after the initial positive patch test reading[7].

Aluminum-containing vaccines should be replaced by aluminum-free vaccines in patients with contact dermatitis to aluminum. However, since not all vaccines have an aluminum-free version, the patient should receive a deep intramuscular injection to reduce the risk of new lesions in cases where no substitute is available. In general terms, the benefits of vaccines outweigh potential complications; therefore, the appearance of the lesions does not justify nonadherence to the vaccination schedule. Similarly, given that aluminum is also a standard adjuvant in subcutaneous allergen-specific immunotherapy, contact allergy to aluminum is a relative contraindication.

It is essential to be aware of the cutaneous complications associated with administration of vaccines. Consequently, in the case of a persistent reaction after administration, we should consider the presence of contact allergy to aluminum. A suggestive clinical history, together with positive patch tests results, should be sufficient to confirm the diagnosis. Early diagnosis will prevent parental anxiety and other, unnecessary and invasive procedures.

Conflicts of interest

The authors declare that they have no conflicts of interest.

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F. Tous Romero[a,*], S.I. Palencia Pérez[a], J.L. Rodríguez Peralto[b], F.J. Ortiz de Frutos[a]

[a] *Servicio de Dermatología, Hospital Universitario 12 de Octubre, Madrid, Spain*

[b] *Servicio de Anatomía Patológica, Hospital Universitario 12 de Octubre, Madrid, Spain*

* Corresponding author.
E-mail address: Fatimatousro@gmail.com
(F. Tous Romero).

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Diagnosis of De Novo HIV Infection in a Dermatology Department☆

Diagnóstico de VIH de novo en un Servicio de Dermatología

To the Editor:

Recent years have seen a progressive increase in the incidence of sexually transmitted infections (STIs).[1] Since the French scientists Barré-Sinoussi and Luc Montagnier identified the human immunodeficiency virus (HIV) as the causative agent of AIDS in 1983 and cases were reported worldwide, awareness programs and information campaigns have been developed to help prevent unsafe sexual practices. Although more than 95% of patients present skin manifestations during the course of the disease, in the vast majority of cases these occur in advanced stages.[2] Because dermatologists frequently manage the diagnosis and treatment of patients who consult for an STI or risky sexual contact, it is important that they perform serology for early detection of primary HIV infection in these patients. In this study we quantify new diagnoses of HIV infection made in a dermatology department and describe the corresponding clinical and epidemiological characteristics.

Data on all cases of new HIV diagnoses made between July 2016 and July 2019 in the dermatology department of Hospital General Universitario de Valencia were obtained from the department's STI database. Early diagnosis was defined as a CD4 count >350 cells/μL in the first tests performed after diagnosis of HIV infection; late diagnosis as a CD4 count <350 cells/μL; and advanced disease as a CD4 count <200 cells/μL.

A total of 18 new HIV diagnoses were established during the 3-year study period, accounting for 1.9% of the total number of STIs diagnosed (n = 940). The clinical and epidemiological characteristics of the patients are shown in Table 1. Twelve of the cases (66.7%) were diagnosed in the screening analysis performed when the patient consulted for an STI. In 2 cases, the diagnosis was not associated with any other concomitant disease or STI. In these 2 cases, both patients presented with acute retroviral syndrome associated with general malaise, asthenia, and a generalized morbilliform macular rash with palmar–plantar involvement that had begun 2 weeks earlier (Fig. 1). Both had normal CD4 lymphocyte counts.

According to the Spanish National Registry of HIV and AIDS Cases (updated June 30, 2019), 3244 new HIV diagnoses were reported in 2018, corresponding to a rate of

Table 1 Clinical and Epidemiological Characteristics of Patients Diagnosed With de Novo Human Immunodeficiency Virus Infection

Variable	Number of Cases, n (%)
Sex	
Male	17 (94.4)
Female	1 (5.6)
Mean age, y	37
Region of Nationality	
Spain	13 (72.2)
Latin America	4 (22.2)
Africa	1 (5.6)
Sexual orientation	
MSM	15 (83.3)
Heterosexual	3 (16.7)
Casual diagnosis after laboratory test	16 (88.8)
Associated diagnosis (n = 16)	
Syphilis	7 (38.8)
Kaposi sarcoma	3 (16.7)
Condylomata acuminata	2 (11.1)
Gonococcal urethritis	2 (11.1)
Bacillary angiomatosis	1 (5.6)
Lymphogranuloma venereum	1 (5.6)
Emergency dermatological consultation	14 (77.8)
History of previous STIs	12 (66.7)
Stage at diagnosis	
Early diagnosis	14 (77.8)
Late diagnosis	3 (16.7)
Advanced diagnosis	1 (5.6)

Abbreviations: MSM, men who have sex with men; STI, sexually transmitted infection.

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