

CASE REPORT

Herpes simplex virus tracheitis in a patient with the acquired immunodeficiency syndrome

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Herpes simplex virus tracheitis in a patient with the acquired immunodeficiency syndrome. L. Baras, C.M. Farber, J.P. Van Vooren, D. Parent. ©ERS Journals Ltd 1994.

ABSTRACT: Herpetic tracheobronchitis and pneumonia occur basically in immunodepressed patients, but have rarely been reported in patients with the acquired immunodeficiency syndrome (AIDS). Some large reviews on pulmonary manifestations in AIDS report a small number of herpetic pulmonary infections, without determining any prevalence of this particular viral involvement.

Predisposing factors are alteration of cell-mediated immunity and invasive procedures (such as endotracheal tube use) in debilitated patients.

The case we report illustrates the occurrence of a herpetic tracheitis in an HIV-infected patient with severe *P. carinii* pneumonia, needing systemic corticotherapy and mechanical ventilation. It illustrates the risk of dissemination of herpes simplex virus (HSV) from a herpetic stomatitis to the lower respiratory tract, even after the endotracheal cannula has been removed.

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Herpes simplex virus (HSV) is rarely recognized as the cause of infective tracheobronchitis or pneumonia in immunocompetent people. These infections have been described basically in immunosuppressed patients and in neonates infected during delivery [1, 2]. Only a few reports of HSV respiratory complications in patients with the acquired immunodeficiency syndrome (AIDS) exist [3–9].

We describe the case of a patient with AIDS and severe *Pneumocystis carinii* infection, which necessitated aggressive management, including mechanical ventilation and corticotherapy. HSV tracheitis was a later complication.

Case report

A 36 year old homosexual male Caucasian, presenting with cutaneous Kaposi's sarcoma (KS), was diagnosed as human immunodeficiency virus (HIV) seropositive. His CD4 lymphocyte count was less than 100 cells·mm⁻³. Zidovudine was prescribed but he received no prophylactic treatment for *Pneumocystis carinii* pneumonia (PCP). KS lesions were managed by local injections of vincristine. He was admitted to another hospital in emergency for pneumonia. *Pneumocystis carinii* was detected in large amounts in the bronchoalveolar lavage fluid. Liver function tests were elevated and a liver biopsy was performed which showed an atypical hepatitis. *P. carinii* were not detected. Standard oral therapy: trimethoprim (240 mg *q.i.d.*) sulphamethoxazole (1,200 mg *q.i.d.*) was inefficient, and after 5 days of treatment, the patient was

referred to our institution, where he was admitted to the intensive care unit. Chest X-ray disclosed a bilateral interstitial pneumopathy. The arterial oxygen tension (Pao₂) was less than 6.7 kPa (50 mmHg) in spite of oxygen administration (fractional inspiratory oxygen (Fio₂) =80%) and continuous positive airway pressure. The patient was then intubated and ventilated mechanically. Co-trimoxazole (trimethoprim 320 mg *q.i.d.* and sulphamethoxazole 1,600 mg *q.i.d.*) and corticosteroids [10] (methylprednisolone 120 mg daily) were administered intravenously. Rapid improvement allowed extubation after 5 days.

A careful examination of oropharyngeal mucosa before and after intubation was normal. No HSV was isolated



Fig. 1. – Large necrotic erosions of nose, mouth and pharyngeal mucosa due to Herpes simplex infection.

from the bronchial aspirates obtained during respiratory support time. After clinical and radiological resolution of pneumopathy, and one week after extubation, the patient presented with fever, hoarseness, sore throat,odynophagia, and large necrotic erosions of the nose, mouth and pharyngeal mucosa (fig. 1). Bronchoscopy showed whitish plaques and erosions on the hard palate, the vocal cords and the trachea. The distribution of the tracheal lesions was restricted to the area previously in contact with the cannula. Bronchi were normal. Fungal infection was clinically suspected, and empirical treatment with intravenous amphotericin B (50 mg daily) was administered for 7 days, without improvement. Herpes infection was demonstrated by isolation of HSV type 1 (HSV 1) in cultures of bronchial washings. Ballooning degeneration of the epidermal keratinocytes in a mucosal biopsy of his hard palate supported the diagnosis. The antibody titre to HSV 1, determined by complement fixation, was low and did not change during the course of herpetic pharyngotracheitis. The patient gradually improved with acyclovir treatment (at first intravenously 7.5 mg·kg⁻¹ *t.i.d.* for 10 days, then orally 5×200 mg·day⁻¹). A rash attributed to trimethoprim sulphamethoxazole appeared. An association active against *P. Carinii* (dapsone-trimethoprim) was substituted for the standard regimen for *P. carinii* infection. No lesions were visible in a bronchoscopy on the 15th day of acyclovir treatment. Cytology and cultures of the bronchial washings were negative for both HSV and *P. carinii*. After 10 weeks of hospitalization, the patient was discharged with zidovudine treatment (600 mg·day⁻¹); dapsone (50 mg·day⁻¹; *P. carinii* secondary prophylaxis) and acyclovir (200 mg *q.i.d.*). Considering the severity of this unusual herpetic infection, the good tolerance of acyclovir and the possible favourable effect of acyclovir on the course of HIV disease [11], a short-term HSV secondary prophylaxis was proposed.

Retrospectively, as the normalization of liver enzyme levels was observed during the treatment of *P. carinii* pneumonia, we suggested that the hepatitis could be related to *P. carinii* infection.

Discussion

HSV is a common infectious agent of skin, oropharynx and genitalia in humans. However, it is an uncommon pathogen of the lower respiratory tract in adults. In these last cases, predisposing factors are generally present: alteration of cellular immunity due to treatments or associated with advanced age, cancer, extended burns, alcoholism and chronic renal failure.

Patients with the adult respiratory distress syndrome (ARDS) can also suffer from HSV tracheobronchitis, as shown for example by TUXEN *et al.* [12]: 30% in a group of 46 patients with ARDS.

No case of herpetic tracheitis in HIV patients has been published to our knowledge. Five reviews on pulmonary manifestations in AIDS report a small number of herpetic pulmonary infections [5–9] (table 1), without determining any prevalence of this particular viral involvement. Only CARSON and GOLDSMITH [4] have clearly described a case of documented herpetic pneumonia in a HIV patient.

In most cases, radiological findings in HSV pneumonia were indistinguishable from PCP (reticular interstitial infiltrate), and diagnosis was made on biopsies obtained during bronchoscopy.

HSV infection generally results from endogenous reactivation of the virus. In theory, HSV may be dormant in either the vagal ganglion with resultant herpetic tracheobronchitis upon reactivation of the virus, or in the trigeminal ganglion with resultant herpetic stomatitis and HSV descending from the upper respiratory tract [1, 2, 13]. Herpetic tracheitis occurred in our patient, who had both HIV-induced and iatrogenic severe immunodeficiency: advanced AIDS (less than 100 CD₄ T-cells·mm⁻³) and systemic corticotherapy.

Furthermore, he required mechanical respiratory support. Tracheal intubation of debilitated people seems to induce spreading of HSV, both by inhalation of oral secretions and by injury to the airway mucosa.

Traumatic mucosal erosions induce squamous metaplasia of the respiratory epithelium. This squamous

Table 1. – Summary of publications concerning herpetic pulmonary infections in AIDS

First author	[Ref.]	Study	Patients n	HIV patients with HSV pulmonary infection
CARSON	[4]	One case report		1 herpetic pneumonia
SUSTER	[5]	Retrospective review of the clinical records and chest radiographs of AIDS patients with pulmonary disease over a 2 year period	95	1 herpetic pneumonia + 1 PCP associated with HSV
COHEN	[6]	Retrospective review of the radiological features of pulmonary complications of AIDS over a 3 year period	52	3 (HSV pneumonia)
MURRAY	[7]	Retrospective study of AIDS patients with pulmonary disorders over a 3 year period	441	2 (HSV pneumonia)
WALLACE	[8]	Examination of the clinical records and autopsy material from patients who died of AIDS with pulmonary disease	54	1
BOZZETTE	[9]	Retrospective study of HIV patients undergoing fiberoptic bronchoscopy for suspected PCP over a 4 year period	327	16

AIDS: acquired immune deficiency syndrome; HIV: human immunodeficiency virus; PCP: *Pneumocystis carinii* pneumonia; HSV: Herpes simplex virus.

metaplasia is comparable to stratified squamous epithelia (skin, genitalia, oral cavity) which HSV infects more readily [1].

Since oral lesions appeared first, in our patient, and tracheal herpetic infection developed precisely in the mucosal areas that had been in contact with the endotracheal tube, HSV appears to have been reactivated in the trigeminal ganglion.

Conclusion

In conclusion, an herpetic stomatitis occurring after endotracheal intubation in an immunosuppressed patient can lead to herpetic tracheobronchitis. The absence of clinical HSV disease at the time of extubation does not exclude a later tracheal involvement. Diagnosis should be performed on biopsies obtained during bronchoscopy and specific treatment (acyclovir) initiated promptly.

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