

## Malignant varicella and tuberculosis co-infections in a 15-year-old HIV-positive patient at Brazzaville University Hospital

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### Abstract

Tuberculosis and chickenpox are two infectious, contagious diseases, transmitted mainly by the respiratory route, and associated with promiscuity, often reflecting low socio-economic status. These two diseases continue to pose a real public health problem in tropical environments such as the Congo. While diagnosis is often straightforward in the case of chickenpox, it requires careful input when associated with tuberculosis, certain symptoms of which may be confused with complications of chickenpox, as in the case of a 15-year-old non-immunosuppressed HIV patient hospitalized in the infectious diseases department of Brazzaville University Hospital.

**Key words:** Varicella, Tuberculosis, Co-infection, CHU, Brazzaville.

### Introduction

The World Health Organization (WHO) has published a new report on tuberculosis, indicating that some 8.2 million new cases of the disease were diagnosed in 2023, the highest number recorded since the WHO began monitoring tuberculosis worldwide in 1995 (1).

The association of chickenpox and tuberculosis poses a real public health problem in sub-Saharan Africa, as in the Republic of Congo, with high

morbidity and mortality rates. These are infectious diseases, transmitted by the respiratory route, linked to the low socio-economic level expressed by promiscuity and non-compliance with hygiene measures (2). Varicella is best diagnosed clinically, and when associated with tuberculosis, a rigorous diagnostic approach is required to avoid confusing the signs found in each of these diseases, such as cough and fever outside the rash. In most cases, if the disease is treated early and correctly, the outcome is favorable, as we describe in the case of a

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patient admitted to the infectious diseases department of the Brazzaville University Hospital with no OMI.

### Observation

This patient, initials AD T, aged 15, was admitted to the infectious diseases department of the Brazzaville University Hospital on August 19, 2024 for the management of skin rashes associated with fever and respiratory discomfort.

The symptomatology dates back to two weeks before hospitalization, with the appearance of pruritic skin rashes associated with a non-quantified vesperal-night fever, which was the subject of a traditional consultation. Treatment consisted of taking traditionally-made herbal teas, without success. The persistence of the symptomatology and the generalization of cutaneous eruptions in a context of prolonged fever associated with an initially dry cough that later becomes productive and brings back whitish sputum in a context of respiratory discomfort, justifies consultation at the Brazzaville University Hospital for better management.

The case involved an adolescent girl immunosuppressed by HIV through vertical transmission, diagnosed at the age of 8, having started antiretroviral treatment (ART) at that time and having abandoned ART for more than 2 years following the death of her parents. Born vaginally from a full-term pregnancy, she had never undergone transfusions or surgery. She is the only child in her sibling group, and has no known allergies to drugs or food.

Clinical examination revealed a patient in poor general condition with frank cutaneous-mucosal pallor, anicteric with no folds of dehydration or malnutrition. The calves were supple and painless,

Rectal temperature was 39°C, heart rate 115 beats per minute and respiratory rate 24 cycles per minute. SpO<sub>2</sub> was 98% under a high-concentration mask with a flow rate of 15 liters per minute. Body mass index 14.7 kg/m<sup>2</sup>, emaciated.

Consciousness was clear, with a Glasgow score of 15. Examination of the skin and appendages revealed vesiculo-bullous lesions with cloudy contents, umbilicated in the center, and crusts on the scalp, where pressure caused a clear liquid to ooze out (Figure 1). Hair is dry, friable and brittle (silky trichopathy), nails normal in appearance. Oral candidiasis and crackling rales in both lung fields, predominantly at the bases. GenXpert in gastric tubing fluid isolated Mycobacterium tuberculosis with no rifampicin resistance, HIV viral load returned to 498,000 copies and an en face chest X-ray showed alveolo-interstitial opacities (Figure 2). The diagnosis of malignant varicella associated with pulmonary tuberculosis was accepted. The patient was treated with EHRZ 3cp/d in the morning on an empty stomach, aciclovir 800mg/d, miconazole 1 tablespoon (2.5ml) three times a day, ceftriaxone 4g/d in a 200ml infusion of SGI 5%. Supportive psychotherapy for 10 days.



Figure 1. profuse, hemorrhagic rash associated with chickenpox in a PvVIII.



Figure 2. Alveolar-interstitial opacities

Under this treatment, the patient achieved Genxpert negatvation on day 15, remission of symptoms on day 18 and initiation of antiretroviral treatment (ABC+3TC+DTG). She was discharged on day 24 of hospitalization.

## Discussion

The interest of this clinical case is to show the association of three transmissible pathologies in the African environment, and particularly in the Congo. It is important to actively search for an opportunistic infection in any HIV-immunocompromised patient who is unwell in the face of an ordinary, well-managed illness.

The association of varicella and tuberculosis in HIV-immunocompromised patients is relatively frequent, but underestimated because all the symptoms are often lumped together in a single pathology (3). Children or adolescents infected with HIV through the vertical route and who fail to comply with treatment have their immune system weakened, and rapidly enter the AIDS stage, justifying the appearance of opportunistic infections such as

tuberculosis (4). The weakened immune system is responsible for the vesiculo-bullous skin lesions associated with varicella, whose mode of transmission is identical to that of tuberculosis. This observation is in line with that made by other African authors in the sub-region (5). Varicella can affect the lungs, leading to varicella pneumonia, especially in adults. Symptoms include a persistent cough, difficult breathing and chest pain, as in the case of the 15-year-old girl.

The cough associated with fever preceding the appearance of the rash is synonymous with the patient's previous BK contamination. The pulmonary condensation syndrome, clinically objectified and supported by a frontal chest X-ray showing reticulo-nodular opacities predominating on the left apex and apical level of the right lung field, points to the diagnosis of tuberculosis, as reported in the literature. The diagnosis of pulmonary tuberculosis is confirmed by the detection of *Mycobacterium tuberculosis* using the GenXpert test on gastric tubing fluid, which remains the gold standard as recommended by the national tuberculosis control program in Congo and decreed by the World Health Organization (6,7). Varicella is usually diagnosed clinically, as was the case with our patient. However, in cases where clinical diagnosis is not sufficient, direct PCR diagnosis is most useful. Depending on the clinical context, PCR can be performed on samples of vesicles, ulcerations or bronchoalveolar lavage fluid (varicella pneumonia). Complications of chickenpox in the immunocompromised, as in our patient, include a severe infectious state with a profuse, haemorrhagic and/or necrotic rash that can last for several weeks, and multiple visceral localizations, especially when a favoring factor is identified, such as the use of anti-inflammatory drugs (8). The treatment of tuberculosis and chick-

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enpox is well codified. Varicella was treated symptomatically with antihistamines, daily showers or baths and local application of an antiseptic solution. Systemic antibiotic therapy was indicated when there was a strong suspicion of bacterial superinfection, as reported in the literature (9). Antiviral therapy was prescribed at a dose of 15mg/kg/8h IV for 10 days, due to HIV immunosuppression. Anti-tuberculosis drugs were prescribed in accordance with the recommendations of the national tuberculosis control program in Congo, including the EHRE combination at a dose of 3cp per day, in the morning on an empty stomach to better reach serum peaks, in the presence of a health worker, for 2 months with a view to moving on to the 2nd phase of RH, 2cp/d for 4 months for a total duration of 6 months (6,7,10).

The overall management of the patient resulted in remission of symptoms, GenXpert negativation at 15 days of treatment and discharge at days 24.

### Conclusion

The association of varicella-tuberculosis and HIV poses the problem of morbidity, with prolonged hospital stays, and interactions with the different drugs used for each pathology, with increased adverse effects. It is important to actively search for tuberculosis in any HIV-immunocompromised patient presenting with malignant varicella and persistent respiratory symptoms.

**Conflict of interest.** The authors declare that they have no conflict of interest in connection with the present work.

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