

## ***Exposure of a patient with systemic lupus erythematosus, under immunosuppression therapy, to human immunodeficiency virus by accidental needlestick contamination***

Exposição de um paciente com lúpus eritematoso sistêmico, sob imunossupressão, ao vírus HIV por contaminação acidental por agulha

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### **Abstract**

**Introduction:** Systemic lupus erythematosus and infection by the human immunodeficiency virus are diseases that affect the immune system. There are few reported cases of the concomitance of both pathologies. **Objective:** To describe a clinical case of lupus who had a needlestick injury and had also HIV exposure. **Method:** Case report description. **Results:** A patient with lupus had a needlestick injury from an HIV positive patient. This person had several intolerances or side effects to retroviral prophylaxis, lupus flare was also observed; however, in the end of 24 weeks his serology was negative and viral load was also undetectable. **Conclusion:** This is the first case report of a patient diagnosed with SLE, using an immunosuppressive, exposed to HIV through a needlestick accident while working **Key words:** Systemic Lupus Erythematosus. HIV. Needlestick Injuries. Immunosuppressant. Anti-HIV Agents.

### **Resumo**

**Introdução:** O lúpus eritematoso sistêmico e a infecção pelo vírus da imunodeficiência humana são doenças que afetam o sistema imunológico. Existem poucos casos relatados da concomitância de ambas as patologias. **Objetivo:** Descrever um relato de caso de uma paciente com lúpus que teve um ferimento penetrante produzido por agulha e foi exposta ao vírus HIV. **Método:** relato de caso. **Resultado:** Um paciente com lúpus teve um ferimento penetrante produzido por agulha proveniente de um paciente com HIV positivo. Esta pessoa teve várias intolerâncias ou efeitos colaterais na profilaxia retroviral, também foi observado a atividade do lúpus; no entanto, no final de 24 semanas, sua sorologia foi negativa e a carga viral também não era detectável. **Conclusão:** Este relato é a primeira descrição de um acidente com lúpus que se contaminou acidentalmente por agulha com o vírus HIV.

**Palavras-chaves:** Lúpus Eritematoso Sistêmico. HIV. Ferimentos penetrantes produzidos por Agulhas. Imunossupressores. Agentes Anti-HIV.

### **INTRODUCTION**

Systemic lupus erythematosus (SLE) is a multisystemic chronic inflammatory disease that can affect various organs. Infections are important causes of death with a standardized mortality ratio of 5.<sup>1,2</sup> Few reports regarding the concomitance of infection by HIV in a patient with SLE exist.<sup>3,4</sup> None describe the period of acute infection and/or the possibility of accidental transmission as a source of transmission although there are reports of simultaneous diagnosis.<sup>4</sup> Lupus patients working in health services have a greater chance of being exposed to infectious agents. One of the many sources of transmission is accidental needlestick injuries. Such accidents are common in clinical

practice, and the risk of transmission varies according to the patient's state of health, the presence of blood and the adequacy of preventive measures.<sup>5</sup>

Following CDC (Centers for Disease Control and Prevention) data, there were 58 confirmed and 150 possible cases of transmission by occupational exposure.<sup>6</sup> Until now, however, there have been no recommendations about the management of patients using immunosuppressant drugs who were exposed to the human immunodeficiency virus (HIV).

The objective of the present article is to report the first case in the English literature of a patient with systemic lupus erythematosus who was exposed to HIV in an occupational manner.

### **CASE REPORT**

A 26-year-old patient, a physician diagnosed with SLE with mucocutaneous manifestations as well as joint and

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hematologic diseases (hemolytic anemia and leucopenia) for the previous 7 years, was in remission for 10 months due to the use of 100 mg/day of azathioprine and 400 mg/day of hydroxychloroquine. A needlestick accident was suffered from a 13 x 4.5 needle, contaminated with the arterial blood of a patient with HIV, in the third right-hand finger. The professional was using gloves during the procedure, and there was transcutaneous piercing with subsequent bleeding. The infected patient was new to treatment and presented infection symptoms disseminated by *Mycobacterium tuberculosis* and with viral load (166,964 log 5.223 and CD4 128). Negative serologies for Hepatitis B and C were noted. Immediately after the accident, cleaning was performed with running water, chlorhexidine and 70% alcohol. The rapid hiv test was not performed. Standard prophylaxis was initiated with 150 mg of lamivudine (3TC) and 300 mg of zidovudine (AZT) twice per day, and 600 mg of indinavir was given starting from 8 hours and 40 minutes after the occurrence, conforme protocolo de 2006 do Ministério da Saúde.<sup>7</sup> The patient developed dyspepsia, epigastric pain and nausea, and indinavir was later replaced with 133/33 mg of lopinavir/ritonavir in six capsules daily. On the 12<sup>th</sup> day, there was uncontrollable vomiting, a fever of 39°C, arthritis of the wrists, elbows and knees, cutaneous rash and poor general condition. The symptoms were more intense in 12-hour intervals. Due to the risk of associated bacterial disease, 1 g/day of levofloxacin was initiated on the 13<sup>th</sup> day. The patient's blood count showed anemia, leucopenia and lymphopenia (11.3 g/dl of hemoglobin, 2000 leukocytes/mm<sup>3</sup> with 14% lymphocytes and 74% neutrophils), symptoms compatible with acute viral infection and/or reactivation of the underlying disease. Azathioprine was then suspended. On the 15<sup>th</sup> day, worsening of the cutaneous rash temporally related to the administration of antiretroviral drugs occurred. The patient developed malaise and intense itching. For this reason, 20 mg/day of prednisone was initiated and antiretroviral drugs suspended. There was improvement in the rash and the gastrointestinal and constitutional symptoms. Weaning from prednisone was initiated to a dose of 5 mg. A gradual reintroduction of antiretroviral drugs was made, with worsening anemia (Hb 9.9 mg/dl) on the 19<sup>th</sup> day; symptoms were attributed to the use of AZT. Also on the 19<sup>th</sup> day, viral load (undetectable – Nasba amplification method), CD4 (594/mm<sup>3</sup> – flow cytometry method), anti-DNA (negative) and complement (C3 73.7 and 67.6 mg/dl and C4 21.6 and 19.7 mg/dl before and after exposure, respectively) levels were verified. On the 24<sup>th</sup> day after AZT suspension, there was a normalization of anemia (Hb of 12.5). Reintroduction of ritonavir/lopinavir provoked a return of the rash, fever (39.3°C) and gastrointestinal symptoms as well as an increase in transaminases (TGP 155 TGO 48). The scheme was again modified for 300 mg/day lamivudine and 300 mg/day tenofovir for 16 more days. Forty days after the accident, azathioprine was reintroduced at a dose of 100 mg/day; however, the patient developed neutropenia (600 neutrophils/mm<sup>3</sup>). Azathioprine was replaced by mycophenolate

molate mofetil, with the improvement of leucopenia and maintenance of remission for 24 months. HIV serologies were performed 6, 12 and 24 weeks after the accident; all serologies were negative.

## DISCUSSION

The present article reports the case of a patient with SLE who suffered occupational exposure to HIV and received antiretroviral prophylaxis with an adequate response.

It is known that both systemic lupus erythematosus itself and its treatment are immunosuppressant factors.<sup>1,2</sup> Patients are exposed to a great quantity of pathogens as well as occupational risks. One method by which to avoid infections involves vaccines. Unfortunately, this recourse is not available for HIV.<sup>7,8</sup>

Prevention is the best method of avoiding transmission of HIV from a needlestick accident. Transmission varies according to the type of accident. Studies show that the average risk of transmission is approximately 0.3% after percutaneous exposure and approximately 0.09% after mucocutaneous exposure.

Both acute HIV infection and systemic lupus erythematosus symptoms as well as the use of medications can be related to the appearance of rashes, lymphopenia and fever. In the reported case, the probability of acute HIV infection was reduced, since prophylaxis was performed in an adequate manner. Prophylaxis continued until the appearance of symptoms and during a 28-day period, even though the viral load was not detectable and the risk of transmission only 0.3%.<sup>9,10</sup>

The pathogenesis of the infection shows us that there is a window of opportunity in which the antiretroviral drug can prevent transmission. After the transmission of the virus, there is a period of 10 days (known as the eclipse) before the viral RNA is detectable in the plasma. After this phase, growth is exponential and attains a peak between 21 and 28 days after infection.<sup>11</sup> Some studies already have shown the presence of the virus 5 days after infection.<sup>10,12</sup> Zidovudine (AZT) is a drug capable of reducing the risk of transmission to 81% after accidental occupational transmission. Regimens of up to three drugs are prescribed when there is elevated risk of infection.<sup>7,9,13</sup>

The Brazilian protocol included zidovudine, lamivudine and indinavir or nelfinavir as recommended drugs in 2006. The 2017 protocol includes dolutegavir as the third drug.<sup>10</sup>

However, antiretroviral drugs are related to a greater risk of presenting adverse effects. Triple regimens are more prone to adverse effects than double regimens. About 50% of health professionals report side effects, and up to 30% of patients with SLE abandon prophylaxis regimens.<sup>9</sup> The combination of lamivudine/zidovudine has known effects: nausea, fatigue, headache, vomiting, diarrhea and myalgia. These effects are amplified when increasing concentrations of protease inhibitors, elevated transaminases and hyperbilirubinemia are added.<sup>4</sup> In

patients using immunosuppressive drugs, these effects may be potentiated.<sup>12,15</sup>

Some immunosuppressants seems to impair HIV activity in vitro, such as micophenolate mofetil combined with abacavir. Dose adjustment may be necessary because of many potential drugs interactions.<sup>16</sup>

In the reported case, suspension of immunosuppressants and maintenance of prophylaxis was chosen since the patient had been in remission for 1 year and had no clinical symptoms suggesting activity prior to the accident. The anti-DNA was permanently undetectable, with low levels of ESR and little variation in the levels of complement. For this reason, the possibility of infection was considered the priority in relation to disease reactivation, keeping in view both the consequences and long-term management.

Even so, the patient still presented significant symptoms (e.g., rash, fever, lymphopenia, anemia and vomiting) in periodic intervals. Suspension of the antiretroviral drugs was accompanied by remission of the symptoms and improvement of general well-being. The antiretroviral drugs were gradually reintroduced, with recrudescence after readministration of lopinavir/ritonavir. Therefore, we concluded that the symptoms were related to this medication.

Maintenance of prophylaxis with tenofovir and lamivudine was chosen. This regimen proved to be safe, without significant adverse effects and with negative serologies 3, 6 and 12 months after the accident.

With respect to the underlying treatment, it was not possible to continue azathioprine due to myelotoxicity. The option chosen was mycophenolate mofetil. The patient used this medication for 24 months, without reactivation of the underlying disease.

## CONCLUSION

This is the first case report of a patient diagnosed with SLE, using an immunosuppressive, exposed to HIV through a needlestick accident while working. The outcome was satisfactory. HIV chemoprophylaxis was successful in this case. The overlap of the clinical manifestations of SLE and the acute phase of HIV makes management complex and decision-making difficult.

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