Open Access Library Journal
2023, Volume 10, e9663
ISSN Online: 2333-9721
ISSN Print: 2333-9705

# Chickenpox in Immunocompromised Patients about 3 Case Reports

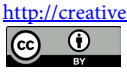
**Najlae Nassiri, Hajar Boudarbala, Ayyad Ghanam, Aziza El Ouali, Abdeladim Babakhouya, Maria Rkain**

Department of Pediatrics, Mohamed VI University Hospital Center, Oujda, Morocco
Email: najlae.nassiri93@gmail.com

**How to cite this paper:** Nassiri, N., Boudarbala, H., Ghanam, A., El Ouali, A., Babakhouya, A. and Rkain, M. (2023) Chickenpox in Immunocompromised Patients about 3 Case Reports. *Open Access Library Journal*, **10**: e9663.
https://doi.org/10.4236/oalib.1109663

**Received:** December 6, 2022
**Accepted:** January 16, 2023
**Published:** January 19, 2023







## Abstract

Chickenpox is a common infectious disease in childhood, usually benign. It can be severe in immunocompromised patients and eventually fatal with multi-visceral involvement. The complications affect 4% - 8% of cases and are dominated by bacterial superinfections, related mainly to staphylococcus and streptococcus. We report 3 cases of chickenpox in patients diagnosed with acute lymphoblastic leukemia. All the patients consulted for a febrile eruption made of multiple cutaneous lesions of different ages with umbilical vesicles which could retain the diagnosis of varicella. Our patients received in intravenous antiviral treatment for 10 days associated with antibiotic therapy (ceftriaxone and amikacin). The evolution was marked by a clinical-biological improvement, with only one death related to a delay of consultation. Our study agrees with the data in the literature concerning the frequency of occurrence of complications and death in immunocompromised patients.

## Subject Areas

Oncology-Pediatrics

## Keywords

Chickenpox, Immunocompromised, Aciclovir, Child

## 1. Introduction

Chickenpox is a highly contagious disease caused by Varicella-Zoster Virus (VZV), it is a highly contagious condition: the attack rate in a susceptible subject is 86.6% after intrafamilial contact [1], 10% - 35% after less intimate contact within a community [2], affecting mainly children around preschool age. Chickenpox is usually considered a benign disease, but can present serious and sometimes fatal

complications, especially in adults or immunocompromised patients, which are dominated by bacterial overinfections, followed by neurological (cerebellite and encephalitis) and pulmonary complications.

Our work highlights the severity of varicella in immunocompromised children, hence the interest in early and adequate management to improve the prognosis.

## 2. Patient and Observation

### 2.1. Observation 1

A 13-year-old boy, with relapsed acute lymphoblastic leukemia (ALL) under chemotherapy consulted for febrile skin lesions. On examination, he was hemodynamically, respiratorily, and neurologically stable, febrile at 38.9˚C. He had widespread maculopapular lesions with vesicles of different ages covering the trunk, back, and face. Cardiovascular, respiratory, and abdominal examinations showed no significant findings. Laboratory workup revealed neutropenia at 330/mm$^3$, C-reactive protein (cRP) at 26 mg/l, and hepatic cytolysis with Aspartate Transaminase (30 times the reference upper value) and Alanine transaminase (n * 32), a low prothrombin rate at 52%. The patient was put on intravenous acyclovir-based antiviral treatment: 20 mg/kg/8hours intravenously for 10 days associated to antibiotic therapy including intravenous ceftriaxone 70 mg/kg/day for 10 days, and 3 days of intravenous amikacine 15 mg/kg/day, with a good clinical and biological evolution, notably normalization of the hepatic balance.

### 2.2. Observation 2

A 5-year-old female child, diagnosed with acute lymphoblastic leukemia under chemotherapy, was admitted to our department for the management of a skin rash; upon admission, the child was asthenic, pale with discolored conjunctiva, apyretic, Physical examination found maculopapular lesions with vesicles in all stages of development at the same time mostly concentrated on the chest and the back, but spreading to the upper and lower limbs. Laboratory tests showed hemoglobin at 5.4 g/dL, neutropenia at 100/mm$^3$, and CRP at 179 mg/l with a normal hepatic balance. In addition to the same treatment that the first patient received, this child received a blood transfusion, the patient was discharged after a good clinical evolution including the disappearance of his rashes, and the normalization of biological findings.

### 2.3. Observation 3

A 6-year-old girl with acute lymphoblastic leukemia receiving chemotherapy; was admitted to the pediatric department after having a 7-day history of a spreading vesicular rash, Physical examination found a conscious child, febrile at 39˚C with an accelerated heart rate at 160 bpm, slightly discolored conjunctiva, maculopapular lesions with vesicles spreading to the trunk, the back, the face, the upper and lower limbs (**Figure 1** and **Figure 2**). Test results were as follows: neutropenia at 1070/mm$^3$, CRP at 252 mg/l, with ASAT and ALAT at 5 times

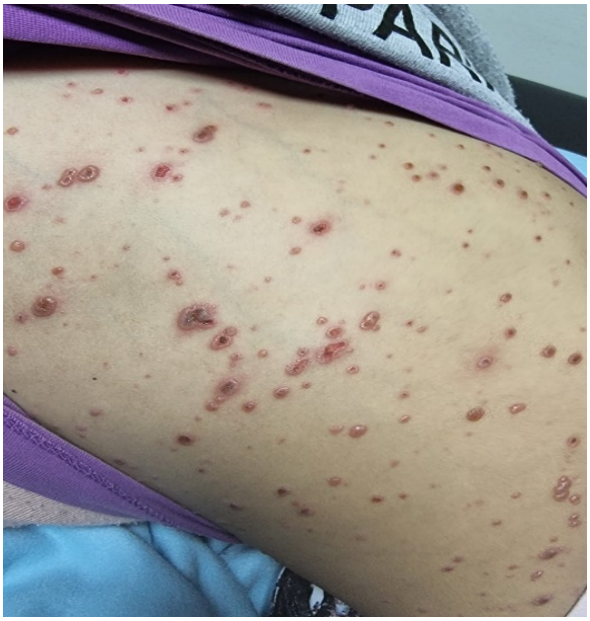


**Figure 1.** Varicella lesions of different ages at the trunk level.

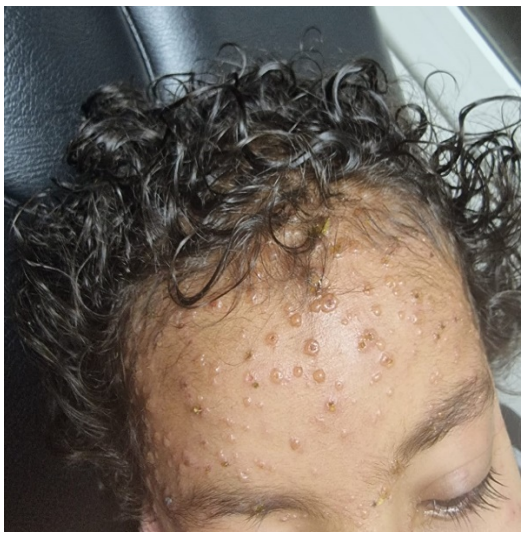


**Figure 2.** Chickenpox lesions on the forehead.

normal, Treatment over the next few days included intravenous acyclovir 10mg/kg/8hours and broad-spectrum bi-antibiotic therapy including ceftriaxone 70 mg/kg/day and amikacin 15 mg/kg/day. Unfortunately, the evolution was marked by a deterioration of the clinical and neurological state, the patient passed away 4 days after being hospitalized.

## 3. Discussion

Chickenpox is a common and almost ubiquitous eruptive disease of childhood; it is a condition usually considered benign, but can be a serious disease when it occurs in immunocompromised children especially those with impaired cellular immunity. This concerns congenital immune deficiencies and especially ac-

quired immune deficiencies related to a malignant pathology and its therapy (immunosuppressive drugs, chemotherapy, corticotherapy), as well as organ and especially bone marrow transplant recipients. Cohort studies have identified patients with leukemia, lymphoma, and cancer as subjects at risk of complicated or generalized forms, observed in 2.7% to 26.2% of cases, with a mortality of 1.5% to 9% of cases [3] [4]. Among the most frequently described complications of VZV infection during chemotherapy and immunosuppression are interstitial or necrotizing pneumonia, viral hepatitis with acute liver failure, coagulopathies, or bacterial overinfections [5] [6]. Several reports describe liver failure without other organ manifestations secondary to VZV in immunocompromised patients [7]-[10], which seems to be a typical clinical manifestation in oncology patients. The reference treatment is intravenous aciclovir at a dosage of 10 to 20 mg/kg/8hours or rather 500 mg/m$^2$/8hours for 7 to 10 days. This treatment should be instituted as soon as possible, at the first signs of varicella [11]. chickenpox vaccination can safely prevent most cases of severe varicella in immunocompromised children. This protection will be very important in countries that do not routinely vaccinate all children against chickenpox.

## 4. Conclusion

In our third patient who consulted after 7 days of evolution, even if an adequate antiviral treatment had been administered, the evolution was marked by death. Therefore, for patients with malignant pathology or under immunosuppressive therapy who present with varicella, antiviral treatment should be administered as soon as possible to improve the prognosis.

## Conflicts of Interest

The authors declare no conflicts of interest.

## References

[1] Ross, A.H. (1962) Modification of Chicken Pox in Family Contacts by Administration of Gamma Globulin. *The New England Journal of Medicine*, **267**, 369-376. https://doi.org/10.1056/NEJM196208232670801

[2] Arvin, A.M. (1996) Varicella-Zoster Virus. *Clinical Microbiology Reviews*, **9**, 361-381. https://doi.org/10.1128/CMR.9.3.361

[3] Saarinen, U.M. (1984) Severe Infections in Childhood Leukaemia: A Follow-Up Study of 100 Consecutive ALL Patients. *Acta Paediatrica Scandinavica*, **73**, 515-522. https://doi.org/10.1111/j.1651-2227.1984.tb09963.x

[4] Feldman, S.F., Hughes, W.T. and Daniel, C.B. (1975) Varicella in Children with Cancer: Seventy Seven Cases. *Pediatrics*, **56**, 388-397. https://doi.org/10.1542/peds.56.3.388

[5] Muller, I., Aepinus, C., Beck, R., Bultmann, B., Niethammer, D. and Klingebiel, T. (2001) Noncutaneous Varicella-Zoster Virus (VZV) Infection with Fatal Liver Failure in a Child with Acute Lymphoblastic Leukemia (ALL). *Medical and Pediatric Oncology*, **37**, 145-147. https://doi.org/10.1002/mpo.1186

[6] Folatre, I., Zolezzi, P., Schmidt, D., Marin, F. and Tager, M. (2003) Infections

Caused by Varicella Zoster Virus in Children with Cancer Aged Less than 15 Years Old. *Revista Médica de Chile*, **131**, 759-764. https://doi.org/10.4067/S0034-98872003000700007

[7] Matsuzaki, A., Suminoe, A., Koga, Y., Kusuhara, K., Hara, T., Ogata, R. and Sata, T. (2008) Fatal Visceral Varicella-Zoster Virus Infection without Skin Involvement in a Child with Acute Lymphoblastic Leukemia. *Pediatric Hematology Oncology Journal*, **25**, 237-242. https://doi.org/10.1080/08880010801938215

[8] Dits, H., Frans, E., Wilmer, A., Van Ranst, M., Fevery, J. and Bobbaers, H. (1998) Varicella-Zoster Virus Infection Associated with Acute Liver Failure. *Clinical Infectious Diseases*, **27**, 209-210. https://doi.org/10.1086/514613

[9] Muller, I., Aepinus, C., Beck, R., Bultmann, B., Niethammer, D. and Klingebiel, T. (2001) Noncutaneous Varicella-Zoster Virus (VZV) Infection with Fatal Liver Failure in a Child with Acute Lymphoblastic Leukemia (ALL). *Medical and Pediatric Oncology*, **37**, 145-147. https://doi.org/10.1002/mpo.1186

[10] Rowland, P., Wald, E.R., Mirro, J.R., Jr Yunis, E., Albo, V.C., Wollman, M.R. and Blatt, J. (1995) Progressive Varicella Presenting with Pain and Minimal Skin Involvement in Children with Acute Lymphoblastic Leukemia. *Journal of Clinical Oncology*, **13**, 1697-1703. https://doi.org/10.1200/JCO.1995.13.7.1697

[11] American Academy of Pediatrics (2003) Varicella-Zoster Infection. In: Pickering, L.K., Ed., *Red Book*: *2003*. *Report of the Committee on Infectious Diseases*. Amer Academy of Pediatrics, Itasca, 673-686.