

Occupational and Nosocomial Transmission of Varicella

Mônica Cardoso Façanha^{1,2}
and Antonia Célia Pinheiro Monroe²

¹Federal University of Ceará; ²Cancer Institute - Cancer Hospital of Ceará; Fortaleza, CE, Brazil

We examined varicella transmission in a hospital specialized in cancer treatment. A cases series study was made of a case of intra-hospital transmission of varicella, based on a revision of the records of patients who had been admitted during the time the index case was in the same service. Records of interviews of employees were also reviewed. During the period that the index case was in the intensive care unit, 34 patients were admitted and 35 employees worked there. Two employees and a patient developed the illness, due to transmission directly or indirectly from the index case. Although this is a service in which most of the patients are adults who have cancer, attention needs to be directed towards diagnosis and to procedures to reduce the transmission of this illness, both to healthcare professionals, and to other patients. A standard schedule for varicella prevention already exists; however, this case reinforces the need for specific vaccination of at-risk professionals.

Key Words: Varicella, varicella-zoster infection, chickenpox, occupational illness, hospital infection.

Varicella is a highly contagious illness that affects almost all non-immunized domiciliary contacts with a sick person; it is asymptomatic in four per cent of the cases [1]. About 90 per cent of all cases involve children between one and six years of age [2]. Usually, it is more severe in adults, and it can be a serious illness in immunocompromised patients [3]. The average incubation period is 14 days; 99 per cent of cases occur between the 10th and the 21st day after exposure. Infection is transmitted from person to person by direct contact or via respiratory secretions. Air transmission has been demonstrated, mainly in hospitals.

An in-hospital varicella or herpes zoster case can provoke an outbreak. Whenever a patient is diagnosed, respiratory and contact isolation is necessary, along with specific immunoglobulin treatment of immunocompromised contacts, if possible within the first few hours after contact [3]; specific vaccines should be given to other susceptible contacts. Less than 10% of employees with no history of varicella are susceptible. One varicella episode, in general, is sufficient to confer permanent immunity [1]. Since 1999, the Advisory Committee on Immunization Practices extended the indications for varicella vaccine. It became indicated as a prerequisite for enrollment of children in schools and in day-care centers, for post-exposure prophylaxis in immunocompetent individuals, and for adolescents and adults with a high risk of exposure. After these rules were applied, the incidence of varicella in the United States was reduced [4, 5]. Healthcare professionals who do not have natural acquired immunity, especially those working with immunocompromised children, should be

vaccinated, not only to protect themselves, but also to prevent transmission to their patients. [3].

In Brazil, varicella vaccine is indicated for children 12 months of age and older, for susceptible adolescents, and for adults who coexist in places where there is a risk for varicella infection. Education and healthcare professionals, day-care center employees, and live-in institution employees (infancy and adolescence shelters, orphanages, military installations), and women of fertile age (not pregnant), are considered high priority candidates. Susceptible persons in constant contact with immunocompromised patients (family, and healthcare professional contacts) should be vaccinated for indirect protection of patients [6, 7]. We examined an incident of hospital transmission of varicella in a cancer-treatment ward.

This report was a case series study of hospital varicella transmission. Patients simultaneously hospitalized with the index case were identified, and their records were reviewed to calculate the rate of infection. Employees who cared for the index patient during the varicella communicable period were interviewed. For the purpose of this investigation, a susceptible employee was defined as one who had never had varicella, and who had never been vaccinated before contact. This study was approved by the Ethics in Research Committee of the Instituto do Cancer do Ceará.

Case Report

The index case was a 63 year-old female patient, from Quixeramobim, a city 201 kilometers from Fortaleza, the capital of Ceará State. She was admitted to the Fortaleza Hospital do Cancer intensive care unit (ICU) January 18, 2004. She had received type B great cell non-Hodgkins lymphoma chemotherapy in November 2003. One month before admission, she developed dermatological lesions that were treated with ivermectin and hydroxyzine. Four days before admission, dermatological lesions worsened, she presented fever and disorientation episodes, and promethazine was prescribed. At admission, she presented hematemesis and was transferred

Received on 22 December 2005; revised 19 March 2006.

Address for correspondence: Dr. Mônica Cardoso Façanha. Rua Pinto Madeira 777, 701, Centro. Fortaleza-CE. Zip code: 60.150-000. Phone: 55 (85) 4009-8044 Fax: 4009-8050.

E-mail- mfacanha@yahoo.com

The Brazilian Journal of Infectious Diseases 2006;10(2):156-158.
© 2006 by The Brazilian Journal of Infectious Diseases and Contexto Publishing. All rights reserved.

without other known secondary cases in their homes or in other hospital sectors. After varicella had been confirmed in the index patient, the two professionals no longer had contact with the index patient. But they had worked with the index patient before diagnosis, they were not excluded during the communicable period, and they continued working with other patients during the entire period, until they themselves were diagnosed. The patient who had acquired the infection in the hospital had physiotherapeutic care January 29 and 30 and February 3, administered by the physiotherapist who later developed varicella. Among the 510 employees, 14 were classified as susceptible and were vaccinated. The person who took care of the second patient was also classified as susceptible, and she was vaccinated February 20. She had not developed varicella by February 29.

Discussion

The persistence of the dermatological lesions and the finding of ulcers in the lower limbs confused the diagnosis and delayed the implementation of varicella transmission control measures in the ICU. Information about vaccination and transmission risks did not reach all the employees with the same efficiency; some susceptible employees worked with other immunocompromised patients after the varicella contact. Apparently, a better internal information system is needed. All employees, independent of their functions, should be aware of the indications for varicella, the reasons for isolation and other preventive measures that should be taken for patients and for healthcare workers.

The secondary varicella case was admitted to the ICU on February 26, when the index patient was already in the isolation room. This second patient did not have a history of varicella contact prior to admission, suggesting that the infection was transmitted by one of the employees who got sick, or less probably, by air, if the isolation was not completely effective. Only one of the 34 patients presented varicella; however, 15 of them could not be followed until the 21st day, because they had either died or did not return to hospital.

This reinforces the need for routine investigation of the varicella immunization status of healthcare workers before job

admission, especially if they will work with immunocompromised patients, because of the risk to the patients and to themselves. If the new employee has not been immunized, vaccination is recommended [6]. The Occupational Health Service should investigate the new employees' specific varicella immunological status before admission. This service can also avoid allowing a susceptible employee, who has been exposed to varicella, to care for immunocompromised patients.

Conclusion

We found intra-hospital transmission of varicella to two employees and a patient. Better dissemination of information on disease transmission and isolation of patients inside the hospital is needed, as well as adequate protection (vaccination) for susceptible employees.

References

1. Brunell P.A. Varicella (Chickenpox, Shingles). In Goldman L. Asuella D. Cecil's Textbook of Medicine 2003, 22nd Edition. Saunders, USA. **1985-87**.
2. Centers for Diseases Control and Prevention. Prevention of varicella updated recommendations of the Advisory Committee on Immunizations Practices (ACIP). *MMWR* **1999**;48(RR06):1-5.
3. Junaan A., Hughes H., Schmid S., et al. VPD Surveillance Manual 2002, 3rd ed, Cap 14, 21pag. Available at: [http://www.cdc.gov/nip/diseases/varicella/#VPD Surveillance Manual](http://www.cdc.gov/nip/diseases/varicella/#VPD_Surveillance_Manual). Accessed date???
4. Centers for diseases Control and Prevention. Decline in annual incidence of varicella – selected states, 1990-2001. *MMWR* **2003**;52(37):884-5.
5. Centers for Diseases Control and Prevention. The Yellow Book. Recommended adult immunization schedule by age group and medical conditions. United States 2003-2004. Available at: <http://www.cdc.gov/travel/diseases/varicella.htm> . Accessed **19/06/05**.
6. Ministério da Saúde do Brasil. Imunobiológicos especiais. Disponível em: <http://www.saude.gov.br/svs>. Accessed **19/06/2005**.
7. Aranda CMSS. Vacina contra Varicela-Zoster. Sociedade Brasileira de Pediatria. 2002. Disponível em http://www.amb.org.br/projeto_diretrizes/100_diretrizes/VACINA11.PDF. - Accessed **28/06/2005**.