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ORIGINAL ARTICLE

Respiratory syncytial virus in immunocompromised patients in a paediatric hospital: 5 years' experience☆

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Received 4 February 2014; accepted 15 April 2014
Available online 1 December 2014

KEYWORDS
Respiratory syncytial virus;
Immunocompromised host;
ECMO;
Ribavirin;
Palivizumab

Abstract
Introduction: Respiratory syncytial virus (RSV) infection is associated with an increase in morbidity and mortality in immunocompromised hosts.
Methods: A description is presented of all cases of RSV infection in immunocompromised paediatric patients in Hematology and Oncology and Immunodeficiency Units between 2008 and 2012.
Results: Nineteen patients were diagnosed with RSV infection. Nine patients required in-patient care and 2 required Paediatric Intensive Care Unit. Five patients were treated with specific therapy (ribavirin ± palivizumab). No deaths occurred in the study period.
Conclusion: RSV infection may be severe in immunocompromised paediatric patients.

PALABRAS CLAVE
Virus respiratorio sincitial;
Inmunodeprimido;
ECMO;
Ribavirina;
Palivizumab

Infección por virus respiratorio sincitial en los pacientes inmunodeprimidos en un hospital pediátrico: experiencia de 5 años

Resumen
Introducción: La infección por virus respiratorio sincitial (VRS) causa importante morbimortalidad en pacientes inmunodeprimidos.
Métodos: Estudio descriptivo en un hospital pediátrico de los casos de infección por VRS en pacientes inmunodeprimidos de las unidades de Hemato-Oncología e Inmunodeficiencias en el periodo 2008–2012.

☆ Please cite this article as: Domínguez-Pinilla N, Belda Hofheinz S, Vivanco Martinez JL, Baro-Fernández M, Ruiz-Contreras J, González-Granado LI. Infección por virus respiratorio sincitial en los pacientes inmunodeprimidos en un hospital pediátrico: experiencia de 5 años. An Pediatr (Barc). 2015;82:35–40.

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Resultados: Se diagnosticaron 19 casos de infección por VRS. Nueve pacientes requirieron ingreso, 2 en Unidad de Cuidados Intensivos Pediátrica. Cinco pacientes precisaron tratamiento con ribavirina y/o palivizumab. No se produjeron fallecimientos.
Conclusión: La infección por VRS es potencialmente grave en los pacientes pediátricos inmunodeprimidos.

Introduction

Respiratory syncytial virus (RSV) is one of the major agents of infection and the main cause of acute bronchiolitis in children.[1,2] In immunocompromised patients, it may cause upper respiratory tract infections, although it more commonly causes lower respiratory tract infections, pneumonia, or even acute respiratory distress syndrome (ARDS) with mortality rates that reach up to 80% in adult patients who have undergone hematopoietic stem cell transplantation (HSCT), with slightly lower rates in paediatric patients.[3,4] Infection by RSV can be diagnosed by different methods, such as rapid antigen detection assay for RSV, viral culture, and amplification of viral DNA by polymerase chain reaction (PCR) in respiratory secretion samples. Treatment in most patients consists of symptom management by means of hydration, nutrition, and respiratory support (including oxygen therapy).[5] Immunocompromised patients have been treated with antiviral agents such as ribavirin (RBV) and the monoclonal antibody palivizumab, which is also used for RSV prophylaxis in at-risk groups. We present a descriptive study of the cases of RSV infection in the haemato-oncology and immunodeficiency unit of a tertiary hospital over a period of 5 years.

Materials and methods

The immunodeficiency unit performed a retrospective study by reviewing the medical records of 138 patients who either had primary immunodeficiencies or were receiving chemotherapy in a tertiary children's hospital between January 1, 2008 and December 31, 2012. The study included those immunocompromised patients that had RSV infections. We reviewed the medical records corresponding to emergency room visits and hospital stays of the patients, collecting data on demographic characteristics (sex, age, underlying disease, immune status) and the setting where the patient had acquired the infection. In the emergency room, infection by RSV was diagnosed by immunochromatographic assay (Clearview®, Wampole Laboratories, United States) for RSV antigen detection in respiratory secretions; and, in patients who tested negative for RSV antigen, by viral shell vial culture assay using the monoclonal antibody Monofluo™ Screen RSV (BioRad, France), or, since January 2010, by means of a commercial RT-PCR kit (Simplexa Flu A/B & RSV kit; catalogue number MOL2600; Focus Diagnostics Inc, Cypress, United States). Upper respiratory tract infections was defined as the presence of cough, rhinorrhoea and/or fever with no signs of lower respiratory tract involvement, which in turn was defined as development of hypoxaemia, stertor or wheezing on auscultation, or accessory muscle use for breathing. Pneumonia was defined as the presence of respiratory symptoms and lung consolidation evidenced by chest radiography. We recorded the observed signs and symptoms and their severity, which was determined based on the need for admission to hospital or the paediatric intensive care unit (PICU) and the requirement for

Table 1 Baseline characteristics of the patients.

Patient baseline characteristics	*N* (%)
Sex	
Male	8 (42)
Female	11 (58)
Age (range)	2.1 years (0.25–14)
Underlying disease	
ALL	7 (36)
AML	2 (10.5)
Atypical choroid plexus papilloma	1 (5)
Choroid plexus carcinoma	1 (5)
Medulloblastoma	1 (5)
PNET	1 (5)
Wilms' tumour	1 (5)
HL	1 (5)
Rhabdomyosarcoma	2 (10.5)
Ewing sarcoma	1 (5)
SCID	1 (5)
Total neutrophil count at the time of infection diagnosis (median/range)	1500/mm^3 (0–9600/mm^3)
Total lymphocyte count at the time of infection diagnosis (median/range)	940/mm^3 (110–3700/mm^3)
Setting where patient acquired infection	
Community	15 (79)
Hospital	4 (21)
Duration of symptoms prior to first visit	
1 day	12 (63)
2 days	3 (16)
3 days	4 (21)