Disponible en ligne sur
ScienceDirect
www.sciencedirect.com

Elsevier Masson France
EM|consulte
www.em-consulte.com

Médecine et maladies infectieuses

Médecine et maladies infectieuses xxx (2017) xxx–xxx

Review

Respiratory syncytial virus infection in elderly adults

Infections à virus respiratoire syncytial du sujet âgé

N. Haber

Service de gériatrie, hôpital Bichat, Assistance publique-Hôpitaux de Paris, 46, rue du Henri-Huchard, 75018 Paris, France

Received 16 September 2016; received in revised form 31 March 2017; accepted 16 January 2018

Abstract

Respiratory syncytial virus (RSV) is a major cause of severe lower respiratory tract infections in infants and young children. Reinfections are common throughout adult life with more severe presentations occurring in immunocompromised individuals, subjects with underlying high-risk cardiopulmonary diseases, and in the elderly. There is now a significant body of literature indicating that the impact of RSV in elderly adults is similar to that of non-pandemic influenza, both in the community and in nursing homes. Clinical manifestations of RSV infections are similar to those caused by other viral respiratory pathogens, including influenza viruses. Molecular tests (reverse transcription-PCR) now provide a rapid diagnosis. The sputum sample combined with nasopharyngeal swab increases the diagnostic yield. At the present time, treatment is mainly symptomatic. The prevention of RSV consists in various infection control strategies, such as standard precautions, especially hand washing and droplet precautions to limit the nosocomial spread. Vaccines and antiviral agents for the prevention and treatment of RSV infections in elderly adults are currently not available, but they are being developed.

Keywords: Elderly; Respiratory syncytial virus; Respiratory tract infection

Résumé

Le virus respiratoire syncytial (VRS) est une cause majeure d'infection respiratoire basse aiguë du nourrisson et du jeune enfant. Chez l'adulte, les réinfections sont fréquentes, avec des formes sévères survenant principalement chez les sujets atteints de broncho-pneumopathie chronique obstructive ou d'insuffisance cardiaque, les adultes immunodéprimés et les sujets âgés. Des études de plus en plus nombreuses indiquent que le VRS est associé à une morbi-mortalité équivalente à celle des virus grippaux chez les sujets âgés, qu'il s'agisse de sujets âgés vivant à domicile ou en institution. Les manifestations cliniques sont similaires à celles des autres viroses respiratoires, y compris des infections grippales. Les techniques d'amplification génique (reverse transcription-PCR) permettent actuellement un diagnostic rapide. La réalisation de prélèvement de crachat, en complément d'un écouvillonnage nasopharyngé améliore le taux de détection virale. Actuellement, le traitement est essentiellement symptomatique. Les mesures préventives reposent sur la mise en place des précautions standards, avec notamment le lavage des mains et des précautions de type « gouttelettes » afin de limiter la diffusion nosocomiale. Aucun vaccin n'est disponible actuellement. Cependant, plusieurs vaccins et molécules antivirales pour la prévention et le traitement des infections à VRS chez le sujet âgé sont actuellement en cours de développement.

Mots clés : Infections respiratoires ; Sujet âgé ; Virus respiratoire syncytial

E-mail address: nicole.haber@aphp.fr

https://doi.org/10.1016/j.medmal.2018.01.008
0399-077X/

1. Introduction

Respiratory syncytial virus (RSV) is an enveloped RNA virus belonging to the Pneumoviridae family and to the *Orthopneumovirus* genus. Two antigenic groups (A and B) have been identified. RSV is annually responsible for outbreaks in temperate climate countries, from November to April, with a peak of activity in December or January. RSV was first identified in 1956 and rapidly became a major cause of acute respiratory tract infections in infants and young children. Reinfections are frequent throughout adult life. First described as benign infections similar to common cold symptoms, RSV infections are actually associated with a significant morbidity and particularly with altered airway resistance that may go on for several weeks. Several severe or fatal cases of infection have been reported in healthy adults. However, severe presentations usually affect adults with chronic obstructive pulmonary disease (COPD) or heart failure, immunocompromised adults, and elderly adults [1–5].

A growing number of studies report that RSV morbidity and mortality in elderly adults are equivalent to those of non-pandemic influenza. These initial studies were performed in North America and Europe, and more recently in China. They all report the growing impact of RSV infections in developed nations as a result of an aging population. We aimed to review recent epidemiological, clinical, diagnostic, and therapeutic data on RSV infections in elderly adults.

2. Epidemiology

2.1. RSV infection in elderly adults living in nursing homes

Several studies conducted in the 1980s revealed that RSV was associated with a substantial morbidity and mortality in elderly residents of nursing homes. The first outbreaks observed in nursing homes were associated with attack rates ranging from 12 to 89%, associated with pneumonia and death rates reaching 55% and 53%, respectively. Prospective studies performed later on during a winter season reported lower attack rates (2–18%), with pneumonia and death rates respectively ranging from 0–33% and 0–5% [1–4,6–10]. This great variability is explained by the different clinical and diagnostic criteria used in these studies, and by the fluctuations in viral activity from one year to another. Indeed, more recent studies performed over several consecutive winter seasons highlighted the concomitant circulation of many viruses in nursing homes, with the predominant viral agent greatly varying by year and geographical area [11–14]. Viruses circulating in nursing homes actually reflect the level of viral activity within the community.

2.2. Community-acquired RSV infections

Three types of methods have been used in studies reporting the epidemiology of community-acquired RSV infections in elderly adults:

- studies based on statistical models and aiming at correlating clinical data (from databases) with the activity of circulating viruses in the community (from surveillance networks) [15];
- prospective cohort studies aiming at determining the incidence rate of RSV infections in various groups of at-risk individuals, and;
- studies reporting the impact of RSV infections among elderly adults hospitalized for acute cardiopulmonary illnesses.

2.3. Estimation of RSV-related morbidity and mortality based on statistical models

Two British epidemiological studies performed in the 1990s suggested that RSV-related morbidity and mortality were probably equivalent to those reported for non-pandemic influenza in elderly adults [16,17]. Fleming and Cross published a study in 1993; they compared death registers, acute respiratory tract infections in adults aged over 65 years, and viral isolates (influenza A and B viruses, and RSV recovered from national surveillance networks) over four consecutive winter seasons. They observed that death peaks and acute respiratory tract infections in elderly adults aged over 65 years were correlated with peaks of activity of influenza viruses and RSV [16]. Nicholson conducted a large study in 1996 over 15 consecutive winter seasons, and estimated that the overall mortality rate attributed to RSV was higher than that of influenza viruses [17]. More recently, several large-scale epidemiological studies also revealed that the impact of RSV and influenza viruses on the rates of hospitalization and mortality was similar in elderly adults [18–23].

2.4. Incidence of community-acquired RSV infections in elderly adults

Several prospective cohort studies were performed in community-dwelling elderly adults; their results revealed an annual incidence of RSV infections ranging between 2 and 10% [2,4,5,24–26]. In an American study conducted by Falsey over four consecutive winter seasons with 608 healthy elderly adults aged over 65 years, RSV infections were identified in 3 to 7% of healthy subjects each year. These rates were approximately twice higher than those associated with influenza A virus [24]. Similar results were observed by the same authors in another study in which 5.5% to 7% of 505 healthy adults aged over 65 years, followed over two consecutive winter seasons, were annually infected with RSV [25]. More recently, the authors of a prospective study performed in 14 countries during a winter season reported that RSV was detected in 7.4% of 556 moderate to severe acute respiratory episodes observed in elderly adults living at home. Of note in this study, the incidence of RSV detection increased with age as RSV was detected in 6.1% of acute respiratory episodes observed in elderly adults aged 65–69 and in respectively 7.1% and 8.7% of cases observed in subjects aged 70–74 years and over 75 years [26]. Other recent studies

Please cite this article in press as: Haber N. Respiratory syncytial virus infection in elderly adults. Med Mal Infect (2017), https://doi.org/10.1016/j.medmal.2018.01.008