

Epidemiology and Clinical Presentation of Respiratory Syncytial Virus (RSV) in Newborns: Experience of Neonatology Service CHU Mohammed VI OUJDA during Winter 2024

Oussama Rezzouki^{1,2,3*}, Sahar Messaoudi^{1,2,3}, Mohammed Ech-Chebab^{1,2,3}, Anass Ayyad^{1,2,3}, Rim Amrani^{1,2,3}

¹Department of Neonatology and Intensive Care Unit, Mohammed VI University Hospital, Oujda, Morocco

²Faculty of Medicine and Pharmacy of Oujda, University Mohammed First, Oujda, Morocco

³Maternal, Child and Mental Health Research Laboratory, Oujda, Morocco

Email: *Orezzouki@yahoo.com

How to cite this paper: Rezzouki, O., Messaoudi, S., Ech-Chebab, M., Ayyad, A. and Amrani, R. (2024) Epidemiology and Clinical Presentation of Respiratory Syncytial Virus (RSV) in Newborns: Experience of Neonatology Service CHU Mohammed VI OUJDA during Winter 2024. *Open Journal of Pediatrics*, 14, 1073-1078.

<https://doi.org/10.4236/ojped.2024.146103>

Received: September 30, 2024

Accepted: November 12, 2024

Published: November 15, 2024

Copyright © 2024 by author(s) and Scientific Research Publishing Inc. This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

Abstract

Respiratory syncytial virus is an important pathogen responsible for lower respiratory tract infections in neonates. This study describes the epidemiological and clinical profile of RSV-positive BAV in 7 newborns who tested positive using PCR-triplex at the neonatology and neonatal intensive care department at Mohammed VI University Hospital-OUJDA (MOROCCO) during the winter of 2024. Among the subjects of our study, there was a female predominance. 29% of cases presented with congenital heart disease, 43% presented with urinary co-infection and 14% died. The average duration of hospitalization was 9 days.

Keywords

Neonate, Respiratory Syncytial Virus, Infection, Outbreak

1. Introduction

Respiratory syncytial virus (RSV) is the most common cause of lower respiratory tract infections in newborns. It is an enveloped, single-stranded, non-segmented, negative-strand RNA virus, a member of the Pneumoviridae family. Globally, RSV is responsible for 2.3% of deaths among newborns aged 0 to 27 days [1]. It's a fairly common, benign-looking infection, but it can be fatal in low-birth-weight premature babies or newborns with co-morbidities.

It's a retrospective study designed to describe the epidemiological, clinical,

therapeutic and prognostic profile of RSV infection.

2. Materials and Methods

A retrospective study in which we collected 7 cases of newborn infants < 28 days of age hospitalized in the department of neonatology and neonatal intensive care CHU Mohammed VI-OUJDA, who presented clinical signs of bronchiolitis with a positive PCR Triplex via nasopharyngeal sampling.

3. Results

In the 7 cases with positive RSV via triplex PCR during the winter of 2024 from December 2023 to March 2024, we note that the peak incidence was in February.

We note a female predominance in 71% of cases in our study (n = 5) with a sex ratio of 0.28, and 86% (n = 6) are at term.

The median age at admission was 25 days (between 16 and 27 days), the median weight was 3400g (between 2500 and 4500 g), the average length of hospitalization was 9 days.

29% of patients (n = 2) presented with congenital heart disease (**Figure 1**).

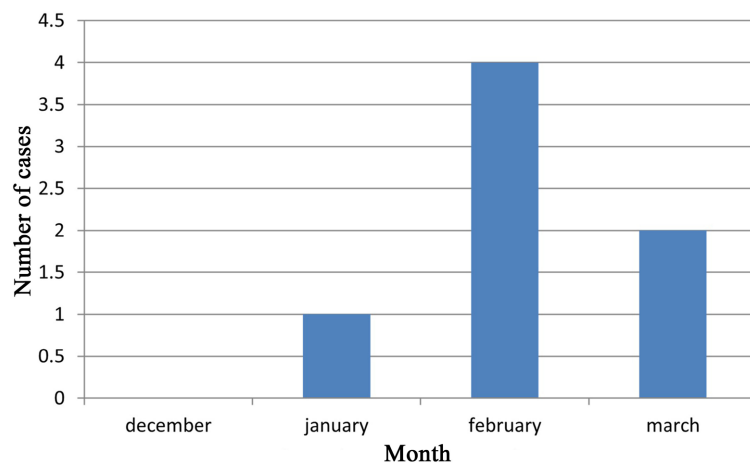


Figure 1. A bar shows the distribution of cases according to month.

3.1. Functional Signs

As shown in the table below (**Table 1**), all patients in our study presented hypotonia (n = 7), 72% presented rhinorrhea (n = 5), cough was present in 57% of patients (n = 4), 3 patients or 42% presented a refusal to breastfeed, while fever was present in only one patient (14%).

Table 1. Table shows the main functional signs of RSV infection.

NOT	Rhinorrhea	Cough	Fever	Hypotonia	Refusal to breastfeed	Vomiting
1	Yes	Yes	No	Yes	No	No
2	Yes	Yes	Yes	Yes	Yes	Yes
3	No	No	No	Yes	Yes	No

Continued

4	Yes	No	No	Yes	No	Yes
5	No	No	No	Yes	No	Yes
6	Yes	Yes	No	Yes	No	No
7	Yes	Yes	No	Yes	Yes	No

3.2. Data from the Clinical Examination

As shown in the table below (**Table 2**); all patients presented with dyspnea with a Silvermann score varying from 2/10 to 4/10.

On auscultation all patients (n = 7) presented pathological rales; with crackles (n = 3), rumbles and sibilants (n = 2).

2 patients, *i.e.*, 29%, presented polypnea (breathing frequency > 60 cpm).

Hepatomegaly was also found in 42% of newborns (n = 3).

Table 2. Table shows main physical signs of RSV infection.

NOT	SS	Auscultation	Polypnea	Others
1	2/10	Crackling	No	Hepatomegaly
2	2/10	Crackling	No	DHA
3	2/10	Snorers	No	Nothing to report
4	4/10	sibilants	No	Hepatomegaly
5	3/10	Snorers	Yes	Nothing to report
6	2/10	Crackling	Yes	Hepatomegaly
7	2/10	Sibilants	No	Nothing to report

3.3. Chest X-Ray

All patients (n = 7) had a chest x-ray, none of which came back normal (**Figure 2**).

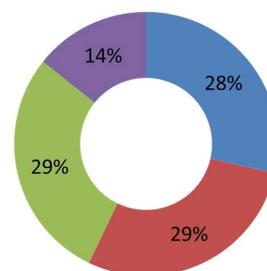


Figure 2. Curve shows the different X-rays lesions of RSV infection.

3.4. Biology Data

CBC:

As shown in **Table 3**: 57% of patients (n = 4) had an anemia and 42% (n = 3) had thrombocytosis, while 1 patient (14%) had anemia and thrombocytosis.

Median of haemoglobin was 13.7.

Median of leukocytes was 12,270.

Median of platelets was 387,000.

Table 3. Table shows table showing CBC of our patients.

NOT	Haemoglobin	Leukocytes	Neutrophils	Lymphocytes	Platelets
1	17	14780	7260	3930	387,000
2	13.2	9260	5450	3260	341,000
3	13.7	27510	16380	5850	743,000
4	15	12270	5500	5330	528,000
5	11	13200	4810	5790	378,000
6	12.3	12096	7180	3280	442,000
7	15.5	9070	2440	5370	201,000

3.5. CRP: C-Reactive Protein

All patients underwent CRP, 4 of whom (57%) came back positive, with a median CRP of 12.

3.6. Therapeutic Care

As shown in **Table 4**; all patients (n = 7) received oxygen therapy.

2 patients received active pressure by CPAP, *i.e.* 29%.

Antibiotic therapy was used in all patients with positive CRP (n = 4).

Corticosteroid therapy was used in only one patient (14%).

Table 4. Different treatment options.

NOT	Oxygen therapy	Antibiotic therapy	Corticosteroid therapy	CPAP
1	Yes	Yes	No	No
2	Yes	Yes	No	Yes
3	Yes	No	No	No
4	Yes	Yes	No	No
5	Yes	No	Yes	Yes
6	Yes	Yes	No	No
7	Yes	No	No	No

3.7. Evolution

6 patients in our study were declared cured (86%), but only one died (14%) despite knowing that he had an underlying congenital heart disease. It was a congenital ventricular hypoplasia.

4. Discussion

All series noted a peak in incidence in the winter season either in Europe, Asia, North America or the Middle East and Turkey, which is similar to our study [2]-[17].

Unlike our study, almost all of the studies had a male predominance unlike the

South Korean study [18].

For most studies the median age at admission was over D15 of life, something in common with our study, except for the study by Smit *et al.* where the median age was 1.3D.

Comorbidities, notably congenital heart disease, are important risk factors either for the disease or for mortality, but they do not have a great impact on the duration of hospitalization which was around 10 days in most series including ours [3] [10].

The clinical signs of RSV bronchiolitis are respiratory distress, cough, rhinorrhea, refusal to breastfeed and pathological groans on auscultation reaching apnea in extreme cases [2]-[16] [18].

Therapeutic management is based on oxygen therapy and symptomatic treatment (nasal decongestion, respiratory physiotherapy), antibiotic therapy has been used in patients with an associated infection (newborns with positive CRP), corticosteroid therapy is rarely [2] [3] or not used at all for the treatment of RSV bronchiolitis except for severe cases [2].

Respiratory assistance is used particularly in premature babies [3] [9] [10].

Acute broncho-alveolitis of RSV is generally a benign condition with a cure rate of over 85% in the majority of studies, but it can be fatal in premature infants and comorbidities [2] [3] [10] [12] [13].

5. Conclusion

RSV bronchiolitis is an infection that can affect all age groups, but it can cause serious complications in newborns, including death. It is therefore important to raise awareness among parents in order to limit the spread of the virus.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

- [1] Singh, S., Maheshwari, A., Namazova, I., Benjamin, J.T. and Wang, Y.P. (2023) Respiratory Syncytial Virus Infections in Neonates: A Persisting Problem. *Newborn*, **2**, 222-234.
- [2] Fodha, I., Landolsi, N., Vabret, A., Sboui, H., Trabelsi, A. and Freymuth, F. (2004) Epidemiology and Clinical Presentation of Respiratory Syncytial Virus Infection in a Tunisian Neonatal Unit from 2000 to 2002. *Annals of Tropical Paediatrics*, **24**, 219-225.
- [3] Kilani, R.A. (2002) Respiratory Syncytial Virus (RSV) Outbreak in the NICU: Description of Eight Cases. *Journal of Tropical Pediatrics*, **48**, 118-122.
- [4] Al-Toum, R., Bdour, S. and Ayyashb, H. (2006) Epidemiology and Clinical Characteristics of Respiratory Syncytial Virus Infections in Jordan. *Journal of Tropical Pediatrics*, **52**, 282-287.
- [5] Gong, L., Wu, C.Y., Lu, M.J., *et al.* (2021) Analysis of Incidence and Clinical Characteristics of RSV Infection in Hospitalized Children: A Retrospective Study. *Risk Management and Healthcare Policy*, **14**, 1525-1531.

- [6] Grimaldi1, M., Milou1, C.C. and Gouyon, J.B. (2002) Pour le Réseau périnatal de Bourgogne Service de pédiatrie 2, Hôpital d'enfants, 10, Boulevard du Maréchal-de-Lattre-de-Tassigny, 21034 Dijon cedex, France; Cellule d'évaluation du réseau périnatal de Bourgogne, Centre hospitalier universitaire de Dijon, 10, Boulevard du Maréchal-de-Lattre-de-Tassigny, 21034 Dijon cedex, France: Étude prospective régionale d'une épidémie de bronchiolites à virus respiratoire syncytial (VRS). *Archives de Pédiatrie*, **9**, 572-580.
- [7] McCormick, J., et al. (2002) Respiratory Syncytial Virus (RSV) Infection among Graduates from a Neonatal Intensive Care Unit. *Pediatric Pulmonology*, **34**, 262-266.
- [8] Chang, S.H., Jang, G.C. and Yoon, S.W. (2018) Clinical Features of Respiratory Syncytial Virus Infection in Neonates: A Single Center Study.
- [9] Hammoud, M.S., et al. (2016) Use of Palivizumab with Other Infection Control Measures to Control Respiratory Syncytial Virus Outbreaks in Neonatal Care Units. *Journal of Tropical Pediatrics*, **62**, 409-414.
- [10] Parejoa, J.C.M., Garcíaa, A.M., et al. (2016) Respiratory Syncytial Virus Outbreak in a Tertiary Hospital Neonatal Intensive Care Unit. *Anales de Pediatría*, **85**, 119-127.
- [11] Valenti, W.M., et al. (1982) Concurrent Outbreaks of Rhinovirus and Respiratory Syncytial Virus in an Intensive Care Nursery: Epidemiology and Associated Risk Factors. *The Journal of Pediatrics*, **100**, 722-726.
- [12] Dizdar, E.A., Aydemir, C., Erdeve, O., et al. (2010) Respiratory Syncytial Virus Outbreak Defined by Rapid Screening in a Neonatal Intensive Care Unit. *Journal of Hospital Infection*, **75**, 292-294.
- [13] Aydin, B., Zenciroğlu, A., et al. (2013) Clinical Course of Community-Acquired Respiratory Syncytial Virus Pneumonia in Newborns Hospitalized in Neonatal Intensive Care Unit. *Tüberküloz ve Toraks*, **61**, 235-244.
- [14] Gijtenbeek, R.G.P., et al. (2015) RSV Infection among Children Born Moderately Preterm in a Community-Based Cohort. *Clinical Trial*, **174**, 435-442.
- [15] Rose, E.B., et al. (2021) Respiratory Syncytial Virus Introductions into a Neonatal Intensive Care Unit. *Journal of the Pediatric Infectious Diseases Society*, **26**, 118-124.
- [16] Smit, P.M., et al. (2013) RT-PCR Detection of Respiratory Pathogens in Newborn Children Admitted to a Neonatal Medium Care Unit. *Pediatric Research*, **73**, 355-361.
- [17] Halasa, N.B., et al. (2005) Medical and Economic Impact of a Respiratory Syncytial Virus Outbreak in a Neonatal Intensive Care Unit. *The Pediatric Infectious Disease Journal*, **24**, 1040-1044.
- [18] Park, E., et al. (2017) Molecular and Clinical Characterization of Human Respiratory Syncytial Virus in South Korea between 2009 and 2014. *Epidemiology & Infection*, **145**, 3226-3242.