Impact of respiratory viruses in intensive care unit patient with community-acquired pneumonia : a one-year retrospective single-centre study.

Marion Giry, Marie Gueudin, Déborah Boyer, Adeline Baron, Gaetan Beduneau, Soumaya Skallil, Steven Grange, Dorothée Carpentier, Fabienne Tamion, Christophe Girault, et al.

Impact of respiratory viruses in intensive care unit patients with community-acquired pneumonia : a one-year retrospective single-centre study

Marion Giry (1), Marie Gueudin (2), Déborah Boyer (1), Adeline Baron (2), Gaetan Beduneau (1), Soumaya Skallil (2), Steven Grange (1), Dorothée Carpentier (1), Fabienne Tamion (1), Christophe Girault (1), Benoit Misset (3)
(1) Rouen University Hospital, Medical ICU, F-76000, Rouen, France (2) Rouen University Hospital, Department of Microbiology, F-76000, Rouen, France
(3) Liège University Hospital, ICU, Liège, Belgium

29th ECCMID Amsterdam, Netherlands 13 – 16 April 2019
The congress of ESCMID

Background

Pneumonia is the **most frequent** community-acquired infection responsible for Intensive Care Unit (ICU) admission. Rapid **multiplex PCR** enables early diagnosis of respiratory infections in daily routine testing. Few studies have been described since this technique has been made available in routine.

Objectives

To assess the **prevalence and distribution** of pathogens among ICU patients with community-acquired pneumonia (CAP) and the relationship with **severity and outcome**.

Methods

We conducted a **retrospective** analysis of data obtained in a French 27 ICU-bed medical unit admitting around 1,000 patients a year. From November 2016 to October 2017, **naso-pharyngal swabs** from 223 patients were collected within **72h after admission** to ICU and tested for 24 pathogens using the sample to answer **ePlex Respiratory Pathogen Panel** which delivered results in 1.5 hours (multiplex PCR). For bacteria testing, we used standard techniques (sputum, bronchial aspiration, bronchoalveolar lavage or blood culture).

Image 1: ePlex Respiratory Pathogen Panel device

Results

A total of **109 patients** had CAP, 39 had aspiration or opportunistic pneumonia, 22 non-pulmonary infections, 11 pulmonary edema, 19 exacerbations of chronic lung disease, and 24 other diagnoses. Patients with CAP had the following characteristics: age 60 +/- 16 years, male sex 60%, length of stay (LOS) in ICU 8.7 +/- 9.0 days, mechanical ventilation 45% and mortality 11%.

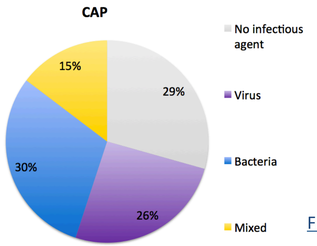

Figure 1: Ratio of bacteria and viruses among CAP

Pathogens	Patients number
No infectious agent	**34**
Virus only	**28**
Bocavirus	1
Coronavirus	2
Influenza A	6
Influenza A + Rhinovirus/Enterovirus	1
Adenovirus	2
Metapneumovirus	1
Rhinovirus/Enterovirus	10
Parainfluenza	4
RSV + Rhinovirus/Enterovirus	1
Bacteria only	**31**
Citrobacter koseri + S. aureus	1
E. coli	2
H. influenzae	4
L. pneumophila	2
Mycoplasma pneumoniae	1
P. aeruginosa	1
S. aureus	1
S. haemolyticus	1
S. pneumoniae	13
S. pneumoniae + E. coli	1
S. pneumoniae + H. influenzae	2
Others bacteria	2
Virus and bacteria	**16**
Influenza A + P. aeruginosa	1
Influenza A + S. aureus + M. catarrhalis	1
Influenza A + S. pneumoniae	2
Influenza A + S. pneumoniae + M. catarrhalis	1
Influenza A + Streptococcus pyogenes	1
Metapneumovirus + S. aureus	1
Metapneumovirus + S. pneumoniae	1
Rhinovirus/Enterovirus + H. influenzae	1
Rhinovirus/Enterovirus + S. pneumoniae	3
Parainfluenza + H. influenzae	1
Parainfluenza + S.pneumoniae	1
RSV + Adenovirus + L. pneumophila	1
RSV + S. pneumoniae	1
Total	**109**

Table 1: Distribution of pathogens among CAP

The main detected bacteria were ***S. pneumonia*** (23%) and ***H. influenza*** (6,5%). The main viruses were **Rhinovirus/Enterovirus** (14 %), **Influenzae A** (11 %) and **Parainfluenzae virus** (5%) and the most frequent virus-bacteria associations were ***S. pneumoniae*** **with Influenzae A** (3%) and **S. pneumoniae with Rhinovirus/Enterovirus** (3%).

The **SAPS 2** score was higher in the mixed group (p = 0.02). The **ICU-LOS** was 5.6 (no agent), 7.7 (virus), 10.0 (bacteria) and 14.8 (mixed) days respectively (p=0.05). **Mortality** was 9,4% (no agent), 7,2% (virus), 15,2% (bacteria) and 6,3% (mixed) with no statistical difference.

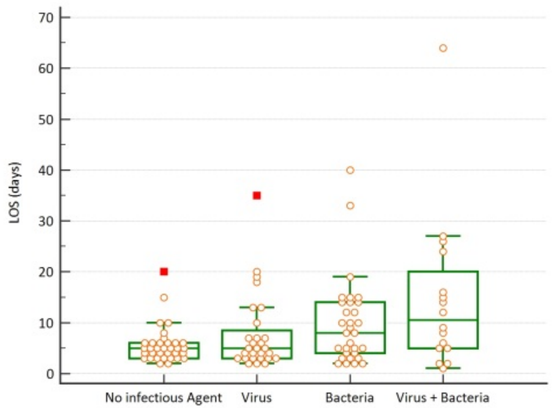

Figure 2 : Box-and-Whisker plot representing the distribution of the LOS depending of the 4 groups of patients.

Conclusion

In our ICU population, **respiratory viruses** were present in **40% of CAP**. Patients with **mixed infections** had **longer ICU-LOS**. These results are consistent with other studies made on this topic (*Voriot et al., Critical Care, 2016).* More studies are needed to evaluate if the implementation of rapid diagnostic testing using multiplex PCR could reduce overuse of antibiotics in patients with CAP.