Herpesviridae lung reactivation and infection in patients with severe Covid-19 or influenza pneumonia: a comparative study

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Background

Lung reactivations of *Herpesviridae*, namely herpes simplex virus (HSV) and cytomegalovirus (CMV), have been reported in mechanically ventilated Covid-19 patients. Whether or not those viral reactivations are more frequent than in non-Covid patients is not known. We compared the frequencies of HSV and CMV reactivations and infections in the lungs of patients with severe Covid-19 pneumonia and patients with severe influenza-associated pneumonia.

Patients and methods

Retrospective monocentric cohort study. 145 mechanically ventilated patients with severe Covid-19 pneumonia, tested for HSV and CMV in bronchoalveolar lavage performed for ventilator-associated pneumonia suspicion. Rates of HSV and CMV lung reactivations were assessed and compared with an historical cohort of 89 patients on MV for severe influenza. Primary endpoints were the rates of HSV and CMV reactivation in Covid-19 and influenza patients. Secondary endpoints were the rate of HSV bronchopneumonitis (HSV BPn, defined as an HSV virus load ≥10^5 copies/10^6 cells) in both groups, and the impact of HSV and CMV reactivations on mortality.

Results

Although proportion of patients with HSV reactivation was similar in both groups (Table), estimated cumulative incidence of HSV reactivation, taking into account death and extubation as competing factors, was significantly higher in influenza patients than in Covid-19 patients (p = 0.03, Figure 1). Taking into account death and extubation as competing factors, estimated cumulative incidence of CMV reactivation was similar in Covid-19 and influenza patients (p = 0,07, Figure 2),

Table: characteristics and outcomes	Covid-19 Patients (n = 145)	Influenza Patients (n = 89)
At ICU admission		
Age, y	53 (44–58)	55 (44–62)
Male sex[a]	103 (71)	50 (56)
Admission SAPS II*	59 (52–67)	71 (59–83)
Admission SOFA score*	12 (9–13)	15 (12–17)
Immunocompromised	12 (8)	13 (15)
Bacterial coinfection*	10 (19)	41 (46)
Procedures and outcome		
Corticosteroids use	127 (88)	18 (20)
ECMO* VA-ECMO VV-ECMO	144 (99) 3 (2) 141 (97)	85 (96) 20 (22) 65 (73)
Days on mechanical ventilation*	44 (24–62)	27 (13–48)
ICU length of stay, days*	49 (31–69)	26 (11–47)
ICU mortality rate, days	63 (43)	44 (49)
Virological findings		
HSV lung reactivation	73 (50)	56 (63)
Time from MV to first HSV detection, days*	13 (10–21)	10 (6–15)
HSV bronchopneumonitis (BPn)	36 (25)	28 (31)
Time from MV to HSV BPn, days	15 (10–21)	14 (12–20)
CMV lung reactivation*	61 (42)	25 (28)
Time from MV to first CMV detection, days*	32 (26–42)	25 (16–39)

Data expressed as median (IQR) or n (%)
* p< 0,05

Figure 1

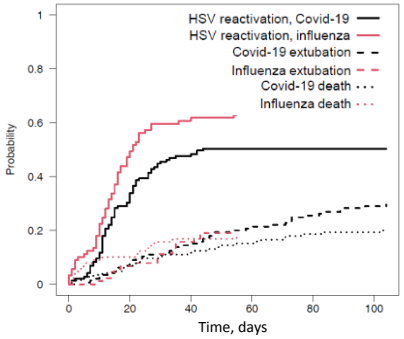
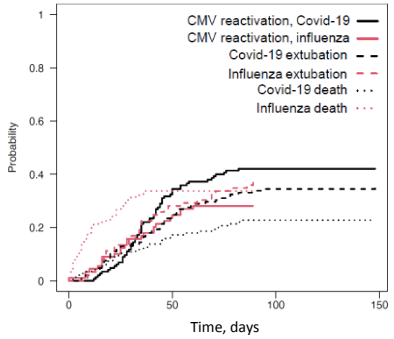


Figure 2



Results (cont'd)

In both groups (Covid-19 and influenza), duration of MV, ICU length of stay and ICU mortality rate were similar in patients with or without *Herpesviridae* lung reactivation, whatever the type of *Herpesviridae* reactivation (HSV alone, CMV alone, both viruses or none). Moreover, in multivariable analysis, *Herpesviridae* lung reactivation was not associated with ICU mortality in patients with Covid-19 and influenza-associated severe pneumonia.

Conclusion

HSV and CMV lung reactivations are frequent in Covid-19 patients, but not more frequent than in patients with influenza-associated severe pneumonia, despite a higher severity of illness at ICU admission of the latter and a longer duration of mechanical ventilation of the former. Although no impact on outcome of HSV and CMV lung reactivations was detected, the effect of antiviral treatment against these *Herpesviridae* in this setting remains to be determined.