Measurement of HSV1, CMV, HHV6 and EBV viral loads in 83 bronchoalveolar lavage from lung transplant recipients

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INTRODUCTION :

•Quantification of herpesviruses DNA in broncho-alveolar lavage (BAL) is a useful tool to monitor virus reactivation in lung transplant recipients.

•Currently, the predictive thresholds for lung disease and therapeutic intervention are not established.

•The purpose of this study was to measure the viral load (VL) of cytomegalovirus (CMV), Epstein-Barr virus (EBV), herpes simplex virus type 1 (HSV1) and human herpesvirus type 6 (HHV6) in the BAL samples of LTR with or without suspected low respiratory infection (LRI).

METHODS :

Restropective analysis

❑ **DNA Extraction :** Easymag (BioMérieux)

❑ **PCR assays (Argene)** : HSV1-2 R-gene®
CMV R-gene®
EBV R-gene®
Prémix HHV-6 R-gene®

❑ **Amplification Platform :** LightCycler 480 II® (Roche)

PATIENTS :

83 BAL collected in 2009 from **25 lung transplant recipients** :

❑ **43** BAL collected for **usual monitoring without symtoms of LRI**

❑ **40** BAL collected for **suspected LRI**

RESULT no. 1 : Prevalence of virus infections

number of viruses	Number of BAL	%
0	41	49
1	26	31
2	12	14
3	3	4
4	1	1
Total	83	100

50% (42 BAL) of BAL were positive at least for 1 virus
19% (16 BAL) of BAL were positive at least for 2 virus
332 viral loads were mesured : 63 were positive (19%)

RESULT no. 2 : Prevalence of each viruses

Virus	Number of BAL	%
HSV1	10	12
CMV	15	18
HHV6	15	18
EBV	23	28

RESULT no. 3 : Association of viruses

Virus association	Number of BAL
EBV/HHV6	4
CMV/EBV	3
HSV1/CMV	2
HSV1/EBV	2
HSV1/HHV6	1
HSV1/CMV/HHV6	1
HSV1/EBV/HHV6	1
CMV/EBV/HHV6	1
CMV/HSV1/EBV/HHV6	1
Total	16

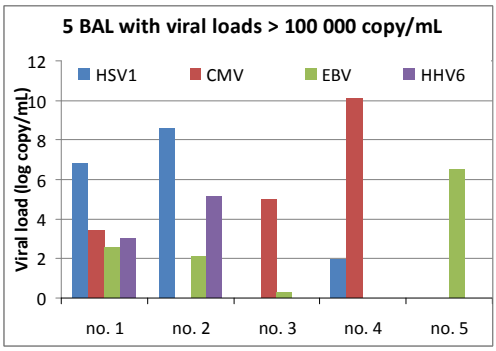
RESULT no. 4 : Quantitative results

• **79% of positive VL were < 1000 copy/mL**

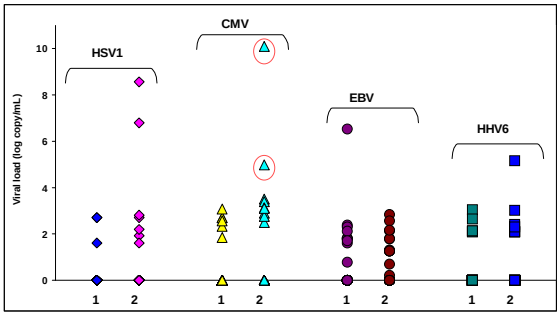
• **10% (5 BAL) presented VL > 100 000 copy/mL** :

→ 4 BAL collected for suspected infection contains associated viruses

→ 1 BAL : collected for usual monitoring contains only EBV



RESULT no. 4 : Distribution of VL depending on the circumstance of the BAL collection



• 1 = usual monitoring,
2 = suspected infection

• No statistical difference between the 2 groupes

• Detection of herpesviruses in 53% of BAL from groupe 2 versus 44% for groupe 1

In two cases of CMV detection the virus was considered as responsible for lung infection

Conclusion:

• EBV, CMV, HHV6 and HSV1 : detected, alone or in association in 50% of BAL from transplant recipients, mostly with low VL (< 1000 copy/mL).

• EBV was the most commonly detected virus: 28%.

• 5 BAL (6%) had VL > 100 000 copy/mL ; in 4 of them a viral co-infections was present

• EBV, CMV, HHV6 and HSV1 are more frequently detected in BAL collected for suspected LRI than in asymptomatic patients.

• The clinical relevance of high viral load in BAL of herpesvirus other than CMV remains to be established.