CRITICAL CARE

LETTER

Cytomegalovirus infection monitored by quantitative real-time PCR in critically ill patients

Julien Bordes*[1,2], Tiphaine Gaillard[3], Jérôme Maslin[3], Pierre Esnault[2], Philippe Goutorbe[2] and Patrick Brisou[2]

Cytomegalovirus (CMV) reactivation has been widely documented in the past 10 years in critically ill patients [1]. Conversely, few data are available on burn patients despite experimental studies showing that these patients are predisposed to herpes virus infections [2]. To our knowledge, only two studies reported the incidence of CMV infection in burn patients using a modern technique, such as PCR, which has become the gold standard [3,4]. These two studies demonstrated a high rate of CMV reactivation, 55% and 71%, respectively. Moreover, CMV reactivation in burn patients has been proven to be intense. Indeed, in the study of Bordes and colleagues [4], 67% of patients who reactivated CMV experienced viremia greater than 1,000 copies/ml, and 33% viremia greater than 10,000 copies/ml. These results may reflect the severe immunosuppression that characterizes thermally injured patients. Consequently, severe burn patients could be considered as a model for CMV reactivation in critically ill patients. However, the precise kinetics of CMV DNA load in these patients is still poorly documented. That is why we would like to briefly present data from longitudinal monitoring of CMV infection by real-time PCR (RT-PCR) in four severe burn patients during their ICU stay (Figure 1).

All the patients were CMV IgG seropositive on admission. They were monitored for CMV reactivation once to twice a week. Detection of CMV DNA in blood samples was performed by quantitative RT-PCR on whole blood. The patients' characteristics are described in Table 1. Patient 2 presented a CMV-associated hemophagocytic syndrome and was treated by ganciclovir for a duration of 21 days. DNAemia became undetectable in patients 3 and 4 spontaneously. These examples demonstrate that critically ill patients may experience several episodes of CMV reactivation during their ICU stay, and that CMV viral load can be very changeable. Furthermore, CMV viremia may be highly variable over a short period.

In our opinion, CMV reactivation in critically ill patients should be monitored with quantitative methods of detection, such as RT-PCR. Indeed, we hypothesize that the potential role of CMV on patient outcome is mostly due to the intensity of CMV reactivation rather than the CMV reactivation *per se*. That is why we suggest that studies aimed at determining the role of CMV reactivation as a contributor to outcome in critically ill patients should use quantitative methods of detection. Consequently, a CMV viremia threshold could be determined to guide preemptive therapy in these patients.

Written consent for publication was obtained from the patients or patients' relatives.

Abbreviations

CMV, cytomegalovirus; PCR, polymerase chain reaction; RT-PCR, real-time PCR.

Competing interests

The authors declare that they have no competing interests.

Author details

[1]Teaching Military Sainte Anne Hospital, Department of Intensive Care and Anesthesiology, BP20545, 83041 Toulon Cedex 9, France. [2]Burn Center, Sainte Anne Hospital, BP20545, 83041 Toulon Cedex 9, France. [3]Laboratory of Biology, Sainte Anne Hospital, BP20545, 83041 Toulon Cedex 9, France.

Published: 18 March 2011

References

1. Osawa R, Singh N: **Cytomegalovirus infection in critically ill patients: a systematic review.** *Crit Care* 2009, **13:**R68.
2. Kobayashi M, Herndon DN, Pollard RB, Suzuki F: **CD4+ contrasuppressor T cells improve the resistance of thermally injured mice infected with HSV.** *J Leukoc Biol* 1995, **58:**159-167.
3. Limaye AP, Kirby KA, Rubenfeld GD, Leisenring WM, Bulger EM, Neff MJ, Gibran NS, Huang ML, Santo Hayes TK, Corey L, Boeckh M: **Cytomegalovirus reactivation in critically ill immunocompetent patients.** *JAMA* 2008, **300:**413-422.
4. Bordes J, Maslin J, Prunet B, d'Aranda E, Lacroix G, Goutorbe P, Dantzer E, Meaudre E: **Cytomegalovirus infection in severe burn patients monitoring by real-time polymerase chain reaction: A prospective study.** *Burns* 2011 [Epub ahead of print].

doi:10.1186/cc10066
Cite this article as: Bordes J, *et al.*: Cytomegalovirus infection monitored by quantitative real-time PCR in critically ill patients. *Critical Care* 2011, **15:**412.

*Correspondence: bordes.julien@neuf.fr
[1]Teaching Military Sainte Anne Hospital, Department of Intensive Care and Anesthesiology, BP20545, 83041 Toulon Cedex 9, France
Full list of author information is available at the end of the article

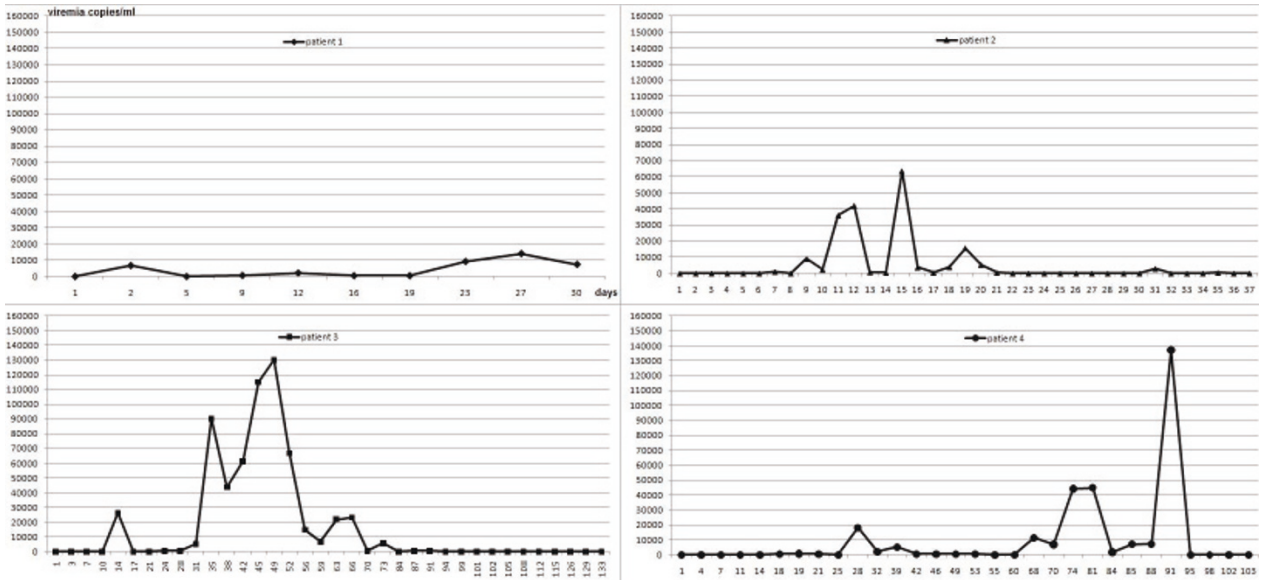

Figure 1. Cytomegalovirus plasma load measurements during ICU stay of four severe burn patients.

Table 1. Patient characteristics

Patient	Age (years)	TBSA (%)	DBSA (%)	IGS 2 score	ICU stay (days)	Viremia peak[a]	Outcome
1	80	15	0	41	30	9,130	Discharged from ICU
2	76	40	40	38	141	63,400	Died in ICU
3	82	15	15	54	133	130,000	Discharged from ICU
4	60	28	20	29	105	137,000	Died in ICU

[a]Viremia peak is expressed in copies/ml. DBSA, deep burn surface area; TBSA, total burn surface area.