Respiratory infections

The efficiency of PCR and immunofluorescence methods to detect human cytomegalovirus in the blood and bronchoalveolar lavage fluid.

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Question: Human cytomegalovirus (HCMV) circulates widely in the human population. In healthy individuals causes usually asymptomatic though persistent infections, while in immunodeficient patients might trigger severe complications. The diagnosis of CMV infection can be substantiated by detection of specific CMV antigen or CMV DNA. We aimed to evaluate the diagnostic effectiveness of CMV identification in various biological materials by immunofluorescence (IF) versus polymerase chain reaction (PCR) methods.

Material and Methods: Seventeen patients with concomitant respiratory disease referred for diagnostic due to suspected acute CMV infection were included in the study. 17 blood (EDTA) samples and 8 bronchoalveolar lavage fluid (BALf) were collected. The human CMV antigenemia was tested by the standard CMV Brite™ Turbo kit (IQ Products, Netherlands) in accordance with the manufacturer's instructions. Human CMV DNA was identified by real-time PCR with Quantification Kit, CMV R-gene™ (Argene, France).

Results: The presence of hCMV was concomitantly evaluated by IF and PCR methods in 9 peripheral blood samples with double negative outcome in 2 patients. 6 samples proved negative with PCR while inconclusive with IF method, one positive with PCR (1/9; Tc = 34,65) but negative with IF method (table1). In 7 paired blood and BALf materials CMV DNA was detected in 3 BALf (3/7), but in none of respective plasma samples (7/7) (table2).

In one patient, PCR method detected CMV DNA in BALf (Tc = 27,36) while blood sample testing was inconclusive or invalid with respectively PCR (Tc= 40) and IF.

In total, the presence of CMV DNA in BALf was detected by PCR in 50,0% (4/8) and in plasma - 5,9% (1/17).

Conclusions: Our data emphasize the need for highly sensitive molecular methods (PCR) as well as the usefulness of BALf for diagnosis of acute respiratory hCMV infection.

Table1. hCMV detection of IF versus real-time PCR.

Result	**Peripheral blood**	
	IF	**real-time PCR**
Positive	0	1/9 (11,1%)

Negative	3/9 (33,3%)	8/9 (88,9%)
Inconclusive	6/9 (66,6%)	0/9

Table 2. hCMV detection efficacy in paired peripheral blood and BALf samples by real-time PCR.

Result	**Plasma**	**BALf**
	real-time PCR	
Positive	0	3/7 (42,86%)
Negative	7/7 (100%)	3/7 (42,86%)

Inconclusive	0	1/7 (14,28%)