

# Correlation between cytomegalovirus retinitis and cytomegalovirus viremia

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## Back ground & Aim

Cytomegalovirus (CMV) retinitis is one of the opportunistic infections for immune deficiency patients. The aim of this study was to assess the relationship between CMV retinitis and viremia.

## Materials and Methods

### 1. Materials

This retrospective study included CMV retinitis who visited Hokkaido University Hospital from 2007 to 2015.

#### ❖ 26 cases (Total 37 eyes)

Bilateral : 15 cases  
Unilateral : 11 cases

#### ❖ Ages

Range 5 - 74 yo (ave. 47.4 yo)

#### ❖ Follow-up period

23.2 ± 21.0 months

#### ❖ Underlying disease

All cases except for Acquired immunodeficiency syndrome (AIDS) were at immunocompromised state with systemic treatments for following diseases.

**Table 1.** Underlying diseases

Malignant lymphomas	10 cases
AIDS	3
Aplastic anemia	2
Marrow dysplasia syndrome	2
Invasive thymus tumor	2
Others	5

### 2. Methods

The results of following tests were investigated from medical records retrospectively.

#### ❖ CMV-DNA in aqueous humor

with Polymerase chain reaction (PCR)

#### ❖ Serum CMV-antigen; antigenemia

with C7-HRP method

#### ❖ CMV retinitis' range of the lesion

posterior pole : within arcade area

1 to 4 quadrants :

area of expanding lesions out of arcade

#### ❖ CMV retinitis' type of the lesion

Exudative type

Granular type

#### ❖ Treatment regimen

Intravenous injection

Intravitreal injection

#### ❖ Complications

#### ❖ Final visual acuity

## Results

### 1. CMV-DNA in aqueous humor

CMV-DNA was detected from the anterior chamber in all the 16 cases examined. The other 7 cases were not inspected because they had already been confirmed to be with positive CMV antigenemia, and the other 3 cases also were not inspected because of their small ages.

### 2. Serum CMV-antigen; antigenemia

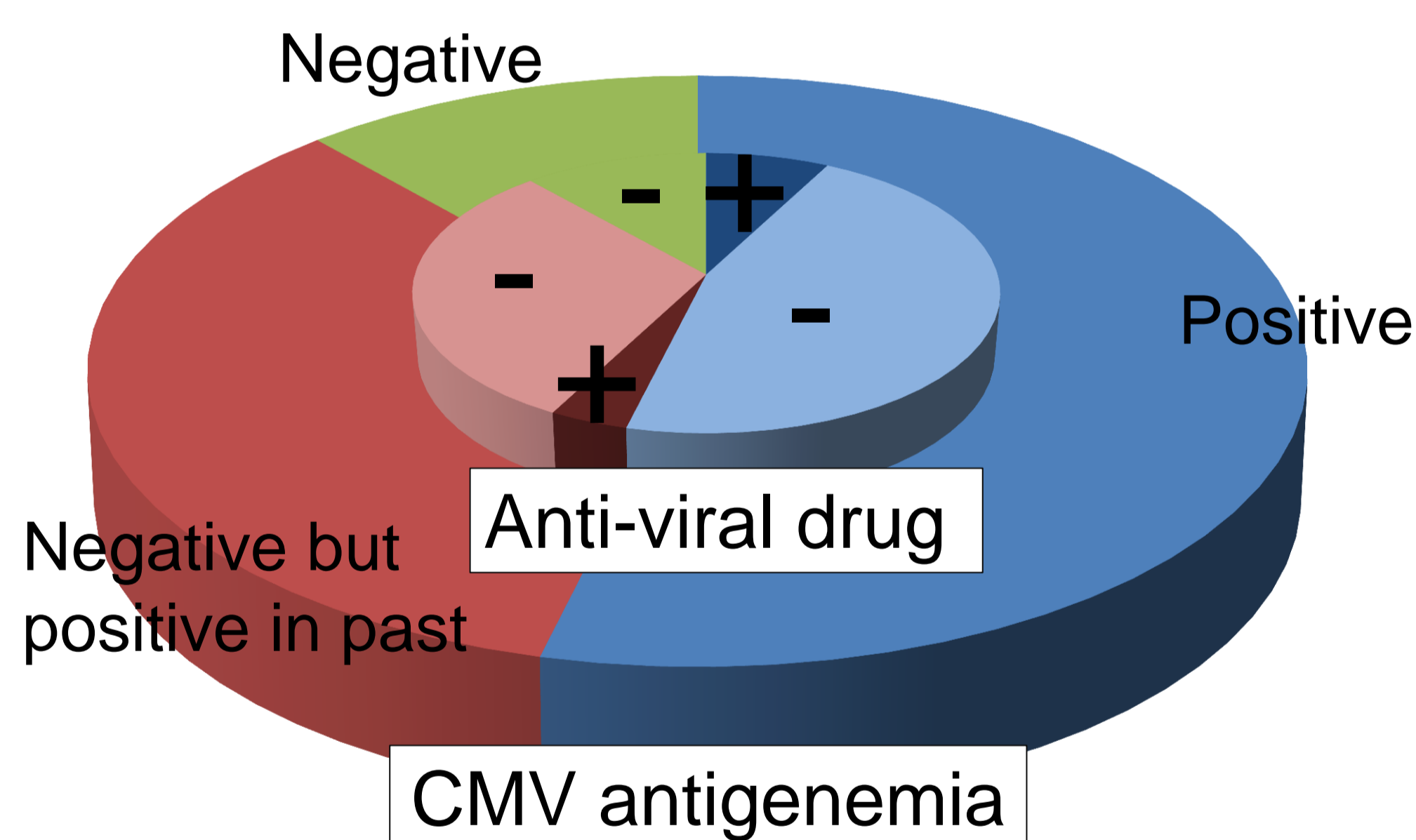
Only 54% of cases were positive for antigenemia at the onset of retinitis, whereas 88% were positive at some time during the entire clinical course of the disease.

**Table 2.** Serum CMV-antigen

	Positive	Negative
At the onsets of retinitis	14 cases (54%)	12 cases (46%)
During the entire clinical course	23 cases (88%)	3 cases (12%)

### 3. Anti-viral therapy at the onset

At the onset of CMV retinitis, anti-viral therapy was discontinued in most of the cases.



**Figure 1.** Medication and antigenemia at the onset of the CMV retinitis.

### 4. Range/ type of lesions

There were less CMV retinitis eyes which included posterior pole lesions, and granular type.

**Table 3.** Range of lesions

	Eyes with lesions out of arcade area	Eyes with Posterior pole lesions
Only posterior		1 eye
1 quadrant (locally)	13 eyes	1
2 quadrants	11	1
3 quadrants	6	0
4 quadrants (widely)	3	1

**Table 4.** Type of lesions

Exudative type	34 eyes
Granular type	3

### 5. Treatments

Ganciclovir intravenous injections were performed in 19 cases, and intravitreal injections were performed in 18 cases (25 eyes). The intravitreal injections were repeated less than 7 times in 9 eyes, 8 times in 8 eyes, and more than 9 times in 6 eyes.

### 6. Complications

Vitreous hemorrhage was seen in 4 eyes, and rhegmatogenous retinal detachment was seen in 3 eyes with exudative type of CMV retinitis.

### 7. Final visual acuity

The final visual acuity less than 0.1 was seen in 10 eyes, and most causes of poor visual prognosis were choroidal atrophy and optic atrophy.

**Table 5.** Final visual acuity

Less than 0.1	10 eyes
0.15 - 0.4	5
0.5 - 0.9	5
More than 1.0	15
Unknown	2

## Discussion

At the onset of the CMV retinitis, anti-viral therapy was discontinued because CMV antigenemia became negative with the previous anti-viral therapy in some patients. This result indicates that the CMV virus still lies latent in retina even after CMV viremia turned to be negative with anti-viral therapy, and then, after the discontinuation of the therapy, the virus reactivate and cause CMV retinitis.

## Conclusions

The major cause of CMV retinitis was an immunocompromised state with systemic treatments for underlying diseases. Even after CMV viremia turns to be negative, careful attention should be paid to the risk of developing retinitis.