Cytomegalovirus Retinitis in Taiwan—A Long-term Multicenter Retrospective Study

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Purpose

To compare the clinical features of cytomegalovirus retinitis (CMVR) in HIV and non-HIV infected patients.

Subjects and Methods

From 2010 to 2016, the charts of all immunocompromised patients with CMVR were reviewed at NTUH and other five Taiwan Uveitis Study Group (TUSG) medical centers in Taiwan. The patients were separated to HIV group and non-HIV group for further comparison.
Each infectious eye was examined and analyzed separately for visual outcome. We defined involved zone (zone 1-3) of CMV retinitis by fundus findings.[1] Best-corrected visual acuity (BCVA) was measured with a Snellen chart. The BCVA results was converted to the logarithm of minimal angle of resolution (logMAR) scale. For the patients only able to count fingers, detect hand motion, light perception, or no light perception were assigned logMAR values of 2.0, 2.3, 2.7, and 3.0, respectively.[2] In order to determine possible prognostic factors associated with poor visual prognosis with CMV retinitis, we categorized all the enrolled patients on the basis of last visited logMAR BCVA. LogMAR BCVA more than 1 at last visit was defined as poor visual prognosis.

Results

A total 110 patients (156 eyes) were enrolled. 64 patients (95 eyes) were in the HIV group and 46 patients (61 eyes) were in the non-HIV group. The mean age is 38.4 ± 9.5 years in HIV group and 40.2 ± 20.8 in the non-HIV group (p=0.537). HIV group patients presented with male predominance (p<0.001) (**table 1**).

There were no significant differences between the groups in pretreatment VA (0.72 ± 0.87 in HIV vs. 0.67 ± 0.85 in non-HIV, p=0.782), VA at last visit (0.67 ± 0.85 in HIV vs. 0.69 ± 0.88 in non-HIV, p=0.885), foveal involvement (30.5% in HIV vs. 21.3% in non-HIV, p=0.201) and zones involvement (zone 1: 68.4% in HIV vs. 56% in non-HIV; zone 2: 24.1% in HIV vs. 32% in non-HIV; zone 3: 7.6% in HIV vs. 12% in non-HIV; p=0.548). No statistical difference was found between the groups for those complicated with retinal detachment (25.3% in HIV vs. 19.7% in non-HIV, p=0.441) (**table 2**). The HIV group had lower recurrence rate: in all patients, 16 eyes had recurrent CMVR; 4 of them were in the HIV and 12 were in the non-HIV group (p=0.003) (**figure 1**).

Table 1. Demographic data of cytomegalovirus retinitis patients

	HIV Group (N = 64)	Non-HIV Group (N = 46)	P value
Age (year, mean ± SD)	38.4 ± 9.5	40.2 ± 20.8	0.537
Sex (men / women)	60 / 4	23 / 23	**<0.001**
Involved eye (Right / Left / Bilateral)	18 / 15 / 31	12 / 19 / 15	0.110
Follow-up time (month, mean ± SD)	46.7 ± 52.9	31.7 ± 33.6	0.092

SD: Standard deviation

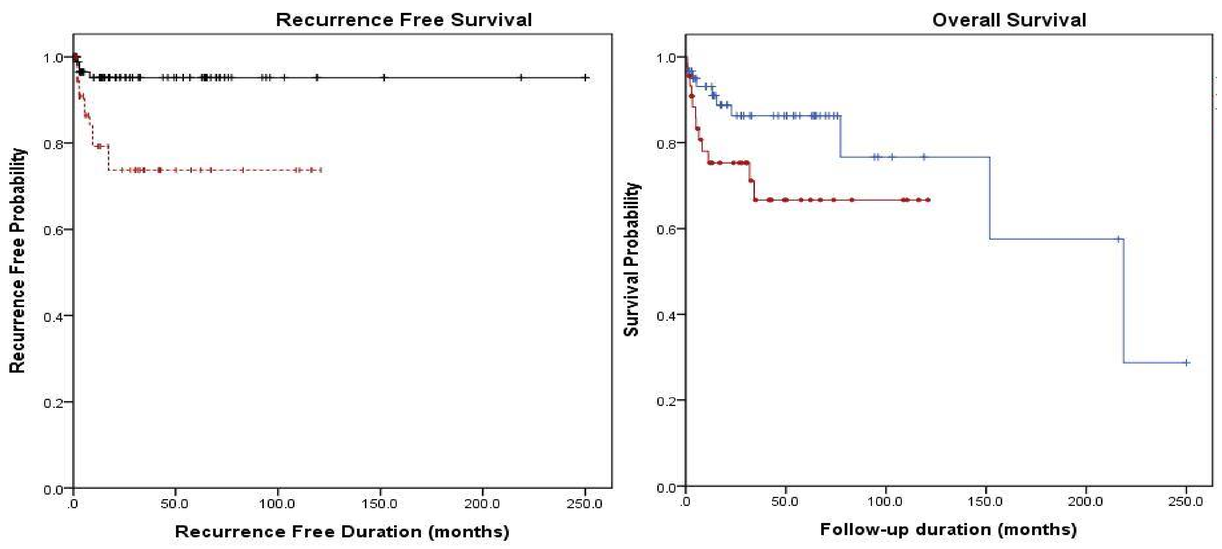
Table 2. Visual acuity and clinical characteristics comparison between CMVR eyes in HIV group and non-HIV group

	HIV Group (N = 95)	Non-HIV Group (N = 61)	P value
BCVA (logMAR; mean ± SD)			
Pre-treatment	0.72 ± 0.87	0.67 ± 0.85	0.782
Post-treatment	0.67± 0.85	0.69 ± 0.88	0.885
Improvement (n/total no., %)	31 / 84 (36.9)	13 / 47 (27.7)	0.337
Fovea involvement (n/total no.,%)	29 / 95 (30.5)	13 / 61 (21.3)	0.201
Involved zone (n/total no., %)			
Zone 1	54 / 79 (68.4)	28 / 50 (56)	
Zone 2	19 / 79 (24.1)	16 / 50 (32)	0.548
Zone 3	6 / 79 (7.6)	6 / 50 (12)	
Retinal detachment (n/total no.,%)	24 / 95 (25.3)	12 / 61 (19.7)	0.441

Both serum and aqueous viral load had no differences between the two groups. Compared with lymphocyte counts at diagnosis, lymphocytes were significantly decreased in the HIV patients (918 ± 765/μl in HIV vs. 2031 ± 2091/μl in non-HIV, p=0.001). For treatment comparison, we found significantly higher portion of non-HIV patients who received intravitreal injection (IVI) of antiviral agents (11.7% in HIV vs. 70.6 in non-HIV, p < 0.001) but there was no significant differences in receiving systemic antiviral agents (87.4% in HIV vs. 88.5% in non-HIV, p=0.474) (**table 3**). For survival analysis using Kaplan-Meier survival analysis, we found a better overall survival rate for HIV group (83.6% in HIV vs. 73.7% in non-HIV, p=0.04) (**figure 1**).

To evaluate possible prognostic factors of visual prognosis in CMV retinitis patients, we firstly applied univariate analysis and found age, initial BCVA, complicated with retinal detachment, and zone 1 involvement were possible prognostic factors (p<0.05). For multiple logistic analysis, poor initial VA, and retinal detachment related poor VA outcome (**table 4**).

Figure 1. Recurrence free survival analysis and overall survival analysis between HIV and non-HIV group



	HIV	Non-HIV
Recurrence (n)	4	12
Recurrence rate	4.2%	19.7%

P value = **0.003**

	HIV	Non-HIV
Survival rate	83.6%	73.3%

P value = **0.04**

Table 3. Lab data and treatment comparison between CMVR eyes in HIV group and non-HIV group

	HIV group (N = 95)	Non-HIV group (N = 61)	P value
CMV viral load (10^5 copies/ml, mean±SD)			
Serum	1.97 ± 9.44	0.38 ± 1.69	0.419
Aqueous	32.74 ± 86.81	9.33 ± 19.86	0.416
Lymphocyte counts (/μl, mean±SD)	918 ± 765	2031 ± 2091	**0.001**
Antiviral treatment (n/total no.,%)			
Intravitreal injection	27 / 95 (28.4)	36 / 61 (59.0)	**<0.001**
Intravenous injection	83 / 95 (87.4)	54 / 61 (88.5)	0.474

Table 4. Multivariate analysis for prognostic factors of poor visual acuity

Variables	Odds ratio	Confidence interval	P value
Age	1.043	0.999 – 1.090	0.056
Pre-treatment BCVA	**3.410**	1.717 – 6.774	**<0.001**
Zone 1 involvement	0.263	0.047 – 1.487	0.131
Retinal detachment	**7.746**	2.281 – 26.307	**<0.001**

Conclusion

For CMVR, both mortality rate and recurrence rate were higher in the non-HIV patients. Poor initial visual acuity and retinal detachment were associated poor prognostic factors.

Reference

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