

## Leukocyte Subpopulations in Patients Infected with Dengue Hemorrhagic Fever

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**OBJECTIVE :** To characterize circulating blood lymphocytes of dengue patients during the acute stage of infection and in convalescence.

**BACKGROUND :** The host immune response to viral infections is characterized by its complexity. This response involves both cellular and humoral components as well as interferon synthesis (1). As one aspect of earlier studies, the cellular immunology of viral infections has been extensively studied and reported (2). Although the amount of effort in this research area has been considerable, there is a paucity of information pertaining to patterns of circulating leukocytes of the host. The investigation of such phenomena serves as the basis of this report.

**METHODS :** Blood specimens were obtained from juveniles admitted to Children's Hospital, Bangkok, Thailand. Infections were confirmed by serodiagnosis. Mononuclear leukocytes were isolated according to the method of Boyum (3). Rosetting procedures were conducted according to the methodology of Mendes et al. (4) with modification (5). Briefly, the percentage of thymic dependent (T) lymphocytes were determined by sheep red cell rosetting with incubation times of 5 minutes, 1 hour and 18 hours. The percentages of Fc receptor positive cells and thymic independent (B) lymphocytes were likewise determined by rosetting. Leukocyte populations were also monitored by differential counts and the projected concentrations of leukocyte subclasses were calculated.

**RESULTS :** Table 1 summarizes the lymphocyte rosette data of the 17 dengue patients who participated in this study. All T lymphocyte patterns were similar. Regardless of the incubation time, the mean values indicated suppression in the acute stage of infection followed by increasing values with convalescence. The values for the Fc cells were fluctuant and while differences were slight there was a suggestion of enhancement during the acute and early convalescent stages. The means for the B lymphocytes were essentially unchanged for the duration of the assay. The projected numbers of circulating lymphocytes are summarized in Table 2. While most values appeared to be stable, those for the E rosette cells (T lymphocytes) are especially noteworthy by their suppression. It is hypothesized that the considerable proportion (mean 10%) of atypical lymphocytes circulating during the acute phase may be, in part, T lymphocytes with impaired ability to form E rosettes. A manuscript on this work is in preparation. This is a final report.

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Table 1. Lymphocyte Rosette Values of Dengue Patients.

Patient Status		E Rosette Cells (%)			EA Rosette Cells (%)	EAC Rosette Cells (%)
		5 minute incubation	1 hour incubation	18 hour incubation		
Acute	Range	21-41	25-46	31-60	5-16	11-23
	Mean	32	37	46	10	17
	S.D.	± 5.3	± 6.7	± 8.1	± 3.0	± 3.3
Convalescent (15 days)	Range	33-52	41-58	50-71	4-25	13-30
	Mean	44	51	63	12	17
	S.D.	± 6.3	± 5.7	± 4.9	± 5.3	± 4.7
Convalescent (30 days)	Range	32-60	45-63	63-73	6-15	13-25
	Mean	46	58	67	9	18
	S.D.	± 6.2	± 6.1	± 3.1	± 6.0	± 3.2

Table 2. Circulating Lymphocyte Subpopulations in Dengue Patients.

Stage	WBC per mm <sup>3</sup>	Lymphocytes per mm <sup>3</sup>	E Rosette Cells			EA Rosette Cells	EAC Rosette Cells
			5 minute	1 hour	18 hour		
Acute	8816	4461	1406	1643	2022	403	730
Day 15	10147	4036	1766	2034	2528	455	677
Day 30	8713	3955	1879	2194	2861	379	738