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Brief communication

The GCB subtype of diffuse large B-cell lymphoma is less frequent in Asian countries

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Abstract

Patients with the germinal center B-cell-like (GCB) subtype of diffuse large B-cell lymphoma (DLBCL) have a significantly better survival rate than those with non-GCB DLBCL. Several studies have examined the proportions of GCB and non-GCB subtypes in large series of DLBCL patients, but it remains unclear if these proportions are the same in different countries. We performed an immunohistochemical analysis of the numbers of GCB and non-GCB subtypes in a large number of patients with DLBCL in Japan and compared the results with literature data for other countries. We found that 71 of 248 patients (29%) had the GCB phenotype and 177 patients (71%) had the non-GCB subtype of DLBCL among our patient population. Assessment of data collected from other studies showed that 31% of DLBCL patients (102/330) have the GCB subtype in Asian countries, but 50% (206/416) express GCB phenotypes in Western countries; based on these data, the occurrence of the GCB subtype of DLBCL was significantly less in Asian countries ($p < 0.001$). Since patients with the GCB phenotype of DLBCL have better survival, future studies of DLBCL should recognize the difference in the proportions of GCB and non-GCB subtypes of DLBCL between Asian and Western populations.

Keywords: Diffuse large B-cell lymphoma; Germinal center B-cell-like subtype; Asian countries; Immunohistochemistry

Diffuse large B-cell lymphoma (DLBCL) is the most common type of non-Hodgkin lymphoma and accounts for 30–40% of new diagnoses [1]. DLBCL occurs over a broad range of ages, manifests at nodal or extra-nodal sites and exhibits distinct biological and clinical heterogeneity [1]. Using cDNA microarray data, Alizadeh et al. recently reported that DLBCL can be divided into prognostically significant subgroups with germinal center B-cell-like (GCB), activated B-cell-like (ABC), or type 3 gene expression profiles [2]. The GCB group had a significantly better survival rate than the ABC group, and the type 3 group was heterogeneous and not well defined, but had a poor outcome similar to that of the ABC group [2]. Hans et al. subsequently reported that the immunohistochemical expression pattern of CD10, Bcl-6 and MUM1 can be used to categorize DLBCL into GCB and non-germinal center B-cell-type (non-GCB) phenotypes (with the latter including the ABC and type 3 subgroups), with an outcome similar to that predicted by cDNA microarray analysis [3]. These studies show that immunohistochemical classification of DLBCL (GCB versus non-GCB) carries prognostic significance.

Several studies have examined the proportion of GCB and non-GCB cases in large series of DLBCL patients in different countries [3–8], and the frequency of occurrence of extra-nodal DLBCL at different sites has also been examined [9–13]. This information is of importance for future clinical studies of DLBCL, but it is unclear whether the proportions of GCB and non-GCB cases and the occurrence of DLBCL at different sites, such as nodal and extra-nodal, are similar in different countries. Therefore, we used immunohistochemistry to analyze the number of GCB and non-GCB subtypes of DLBCL in a large series of patients in Japan, and compared the results with those from studies in other countries.

A total of 248 DLBCL patients (154 men and 94 women) diagnosed between 1986 and 2006 at our hospital were

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Table 1
Comparison of diffuse large B-cell lymphomas of GCB and non-GCB immunophenotypes in Asian and Western countries

Studies	Countries	Regions	*n*	GCB: + any any	GCB: - + -	CD10 BCL-6 MUM1	non-GCB: - - any	non-GCB: - + +				*n*	GCB	non-GCB	*Chi-square test*
Current study	Japan	Asian countries	248	71 (29)	56 15		177 (71)	57 120	N.S.	N.S.	N.S.	330	102 (31)	228 (69)	*P< .001*
Oh YH [4]	Korea		50	21 (42)			29 (58)		N.S.						
Chen WY [5]	China		32	10 (31)			22 (69)								
Berglund M [6]	Sweden	Western countries	157	82 (52)			75 (48)		N.S.	N.S.	N.S.	416	206 (50)	210 (50)	
Hans CP [3]	U.S., Canada, Germany, Norway, Spain		152	64 (42)	42 22		88 (58)	61 27	*P< .05*						
van Imhoff GW [7]	Netherlands		66	38 (58)	32 6		28 (42)	8 20	N.S.						
Chang CC [8]	U.S.		41	22 (54)	16 6		19 (46)	14 5							

N.S., no significance; +, positive; −, negative; GCB, germinal center B-cell type.