Classification of diffuse large B-cell lymphoma by immunohistochemistry demonstrates that elderly patients are more common in the non-GC subgroup and younger patients in the GC subgroup

In accordance with a recent study by Mareschal *et al.*, in which they classified diffuse large B-cell lymphoma (DLBCL) by using expression profiling techniques, we show that elderly patients (≥ 80 years) are more common in the "non-germinal center subgroup" (non-GC) compared to younger patients (50-59 years), while younger patients are more common in the "germinal center subgroup" (GC) when compared to elderly patients (P=0.02).[1] We also show that classifying (DLBCL) into the non-GC group or the GC group by means of certain immunohistochemistry criteria according to Hans *et al.* gives similar results in terms of differences in age distribution as observed by Mareschal *et al.*[1,2]

DLBCL is the most common type of B-cell lymphoma and accounts for about 40% of all lymphoid tumors.[3] DLBCL is characterized by an aggressive clinical course and a clinical, pathological and molecular heterogeneity which makes the choice of treatment and prognosis difficult. The International Prognostic Index (IPI), which relies on clinical parameters such as age, clinical stage, performance status, etc. is currently used for prognostic prediction in DLBCL. However, many studies have found molecular markers of prognostic relevance, such as the classification of DLBCL into germinal center B-like (GCB) and activated B cell-like (ABC) groups using expression profiling techniques.[4,5]

In a study by Hans and colleagues, this classification of DLBCL into GCB and ABC groups by expression profiling can also be performed by immunohistochemistry using the antibodies BCL-6, CD10, MUM1, and cases can be assigned to either of two groups using a new nomenclature: GC-group and non-GC group.[2] Nevertheless, according to Hans *et al.*, the GCB group is more or less the same group as the GC group and the ABC group is more or less equivalent to the non-GC group.[2]

Mareschal *et al.* recently reported that the proportion of ABC subtype among *de novo* DLBCL increased with age.[1] This group found that the ABC/non-ABC distribution differed significantly between younger patients (50-60 years) and elderly patients (≥ 80 years); the ABC subtype was more common in the elderly group (P=0.01).[1] Complementing this comprehensive study, we analyzed the age distribution between GC-group and non-GC group in a cohort of 192 *de novo* DLBCL patients with 90 patients in the GC-group and 102 patients in the non-GC group.

In accordance to the Mareschal *et al.* study, we found that the non-GC group/GC-group distribution differed significantly between younger patients (50-59 years) and elderly patients (≥ 80 years), where the non-GC group subtype was more common in the elderly group (P=0.02) (Figure 1). The explanation for this skewing distribution of non-GC group and GC-group in different age groups has already been discussed by Mareschal *et al.* They speculate that it reflects a change in the B-cell population during aging or relates to the pathological specificity of DLBCL in elderly patients.[1]

In summary, in line with the Mareschal *et al.* study, we show that there is a higher frequency of elderly patients (≥ 80 years) in the non-GC group compared to younger patients (50-59 years) while there is an overrepresentation of younger patients in the GC group. We also show that classifying DLBCL into non-GC or GC groups by using immunohistochemistry according to Hans *et al.* shows a similar pattern in terms of differences in age distribution, as by the Mareschal *et al.* classification.[1,2] However, it is necessary to further explore the biological aspects behind this finding. It would also be desirable to confirm the finding in a number of larger cohorts.

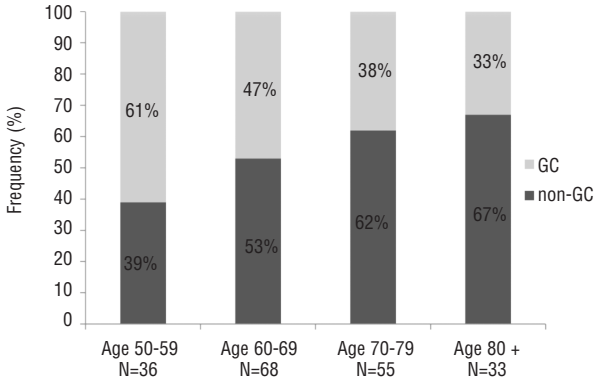

Figure 1. GC and non-GC proportions in age groups of DLBCL patients, "N" indicates numbers of patients in each age group. The difference between groups 1 and 4 is significant (P=0.02).

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