Diagnostic value of pulmonary NKT $CD3^+CD16/56^+$ cells

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Background

Natural killer T (NKT) cells, a unique subgroup of T cells, may be implicated in the pathogenesis of interstitial lung diseases (ILDs).

Methods

We used multi-parameter flow cytometry with antibodies to CD3, CD4, CD8, CD14, CD45 and CD16/56 in BAL fluid (BALF) to examine the diagnostic relevance of pulmonary $CD3^+CD16/56^+$ NKT cells and to compare them with NK cell frequencies and CD4/CD8 index. We selected and analysed only BALF of patients with initial increased (> 8%) frequency of $CD3^+CD16/56^+$ NKT cells.

Results

Of 88 selected patients with increased frequencies, 25 patients were diagnosed as hypersensitivity pneumonatis (HP) and 35 as sarcoidosis (SA), 14 patients demonstrated diffuse ILDs, 7 had malignant diseases and 7 patients had bacterial infection. The uppermost frequencies of BALF $CD3^+CD16/56^+$ NKT cells were demonstrated in patients with HP (median of 16%, range 8% to 52%), and those values were significantly higher as $CD3^+CD16/56^+$ frequencies observed in patients with SA (10%, range 8% to 19%) or diffuse ILDs (10.5%, range 8% to 17%; P<0.0001). In contrast, there was no difference in the proportion of $CD3^-CD16/56^+$ natural killer (NK) cells between all study groups (median value from 3 up to 4.5% with the range from 0% up 18%; P=0.17) Patients with sarcoidosis have also significantly higher CD4/CD8 ratio (median 2.4, range 0.26 to 12.14) in comparison to patients with HP (median 0.46, range 0.04 to 10.4; P<0.0001).

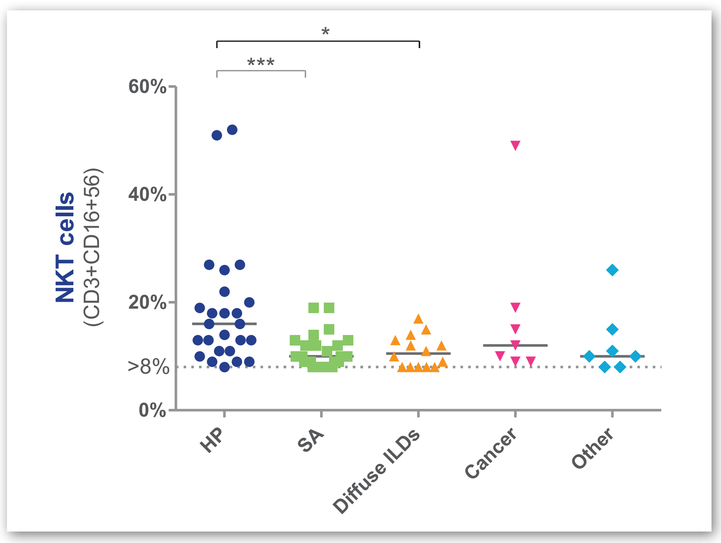

Figure 1. Frequencies of BALF $CD3^+CD16/56^+$ NKT cells in patients with HP (median of 16%, range 8% to 52%): values were significantly higher as $CD3^+CD16/56^+$ frequencies in patients with SA (10%, range 8% to 19%) or diffuse ILDs (10.5%, range 8% to 17%; P<0.0001). The horizontal solid bars indicate the median value for each group.

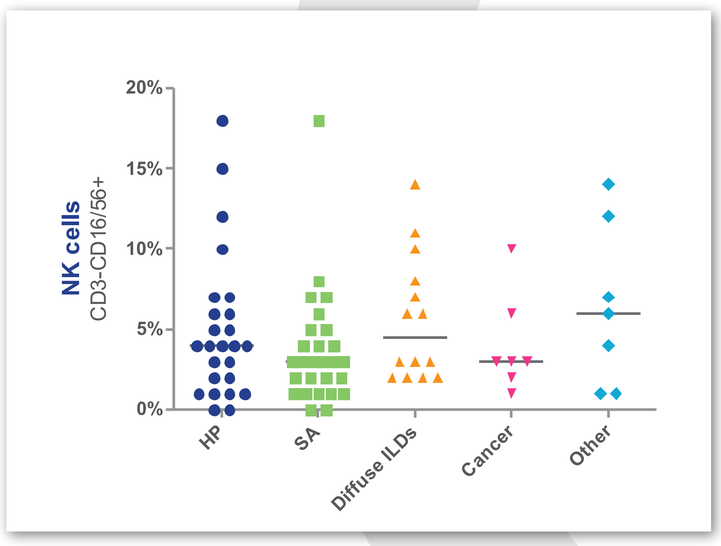

Figure 2. Proportion of $CD3^-CD16/56^+$ natural killer (NK) cells between all study groups (median value from 3 up to 4.5% with the range from 0% up 18%; P=0.17) The horizontal solid bars indicate the median value for each group.

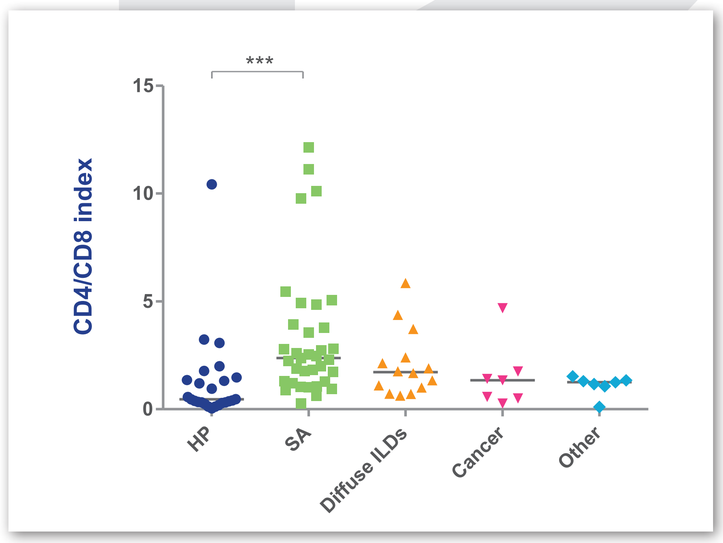

Figure 3. Summary plot of an overall comparison of BAL CD4/CD8 ratio: significantly higher CD4/CD8 ratio in pts with sarcoidosis (median 2.4, range 0.26 to 12.14) in comparison to patients with HP (median 0.46, range 0.04 to 10.4; P<0.0001). The horizontal solid bars indicate the median value for each group.

Conclusion

This study showed that high frequencies of pulmonary NKT $CD3^+CD16/56^+$ cells, but not NK cells, might have important role for diagnostic evaluation of HP.

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