Abstract

Automated Detection of High Fluorescence Lymphocytes Count (HFL) with the SYSMEX XE-2100

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Introduction:
Up to 10% of all CBC+DIFF daily routine samples showed in the DIFF-Channel an increase count of lymphocytes with a high Fluorescence signal (research parameter “other” count), flagged as atypical lymphocytes. The intention of this study was to evaluate the usefulness of the “other” parameter (high fluorescence lymphocytes=HFL count) of the SYSMEX XE-2100 by identifying the type of cells in this area. This would represent an additional parameter beside IG and NRBC in case of inflammatory and bacterial or viral infection diseases with a positive prognostic value.

Objective:
The target was to prove which kind of abnormal (activated) cell-types are found in this HFL area “Other-Area”. The investigated cell-types are: a) Activated B-lymphocytes, immunoglobulin-producing cells (plasma cells and/or immunocytes =lymphoplasmocytoid). b) Activated T-lymphocytes (cytotoxic T-cells or T-cells with chemotaxis/ phagocytosis). c) Large granular lymphocytes (natural killer-cells). d) Activated monocytes (Macrophages). e) Immature granulocytes (promylocytes, myelocytes, metamyelocytes)
The extended automated differential HFL count of the XE-2100 from a total of 85 selected patients (hematological system diseases are excluded) was compared with the immunophenotyping flow cytometry method FACScalibur B&D and morphological assessment of the peripheral blood smear with pattern recognition system Cellavision DM96.

Results:
The XE-2100 HFL (Other) showed an excellent correlation with activated B-Lymphocytes from the 85 patients measured by the different methods, R^2=0.895 and p<0.001 with the microscopy morphological types plasma cells plus immunocytes and respective R^2=0.800 and p<0.001 with the immunophenotyping method $CD19^+$, High Ssc, $CD14^-$, $CD138^+$, $sIgM^+$ cells.

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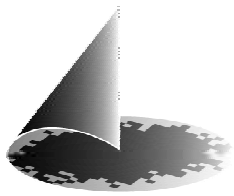

The correlation between HFL-count with activated T-cells was poor, R^2=0.061 and p=0.05 with the microscopy morphological abnormal lymphocytes (without plasma cells, immunocytes and large granular lymphocytes) and respective R^2=0.011 and p=0.40 with the immunophenotyping method T-suppressors cells ($CD3^+$, $CD8^+$, $CD4^-$) plus cytotoxic T-lymphocytes ($CD3^+$, $CD16^+$+ $CD56^+$). There is also no correlation between HFL-count and the large granular lymphocytes (natural killer-cells), R^2=0.027 and p=0.14 with the microscopy morphological NK-cells and respective R^2=0.038 and p=0.56 with the immunophenotyping method natural killer-cells ($CD3^-$, $CD19^-$, $CD16^+$+ $CD56^+$). The correlation between the HFL count and the microscopy morphological activated monocytes (macrophages) showed no correlation, R^2=0.003 and p=0.64. And finally there was also no correlation between the HFL count and the microscopy morphological immature granulocytes, R^2=0.001 and p=0.76.

Conclusion:
The HFL area (other count) showed a significant correlation with both methods, microscopy and immunophenotyping only for activated B-lymphocytes, the immunoglobulin producing cells. The extended automated differential count of immunoglobulin producing cells could be of high interest in the differentiation between inflammation and infection and (monitoring) determination of the positive prognostic value in systemic infectious diseases.