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临床研究

SDF-1/CXCR4轴在白血病患者骨髓中的表达及与血管新生的关系

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Relationship between Expression of SDF-1/CXCR4 Axis and Angiogenesis in Bone Marrow of Patients with Leukemia

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摘要 目的：探讨SDF-1/CXCR4轴在白血病患者骨髓中的表达及与血管新生的关系。
方法:采用 CD45/SSC设门四色流式细胞仪检测55例白血病患者骨髓的CXCR4表达。采用ELISA法检测SDF-1/VEGF；采用Envinson二步法检测骨髓组织MVD；多重PCR法检测白血病患者IgH、TCRγ链V区和J区，采用G-显带技术进行细胞遗传学核型分析。
结果:AML组SDF-1(2145.21±329.45)pg/ml、CXCR4阳性表达率 (60.01±18.5)%；ALL组SDF-1(2549.02±303.4）pg/ml、 CXCR4阳性表达率（70.22±12.73）%；CML组SDF-1(1929.72±253.81)pg/ml、CXCR4阳性表达率（40.05±16.69）%；CRAL组SDF-1(2070.98±159.98)pg/mL、CXCR4阳性表达率(58.4±11.8)%；与对照组相比均明显增高，P<0.05。急淋SDF-1/CXCR4表达率高于其他白血病组；白血病SDF-1/CXCR4表达与相关因素的分析中发现，ALL与外周血WBC数量有相关性(r=0.534、 0.567, P<0.01)，与急性白血病伴髓外浸润者有意义(P<0.05）；SDF-1/CXCR4 表达与白血病患者血小板计数、年龄、性别差异、骨髓增生程度、染色体改变、急性白血病骨髓细胞CD34+表达、ALL的IgH和TCRγ链V区和J区基因重排等因素无明显关系。白血病患者骨髓SDF-1、CXCR4、VEGF的相关系数为0.552, 0.553， 0.531，P<0.05。三者具有显著相关性。
结论:白血病骨髓液中SDF-1含量及各群细胞CXCR4高表达，其中ALL表达最高；急性白血病缓解后依然高表达；SDF-1/CXCR4表达与ALL的外周血白细胞数量、有髓外浸润者有关，白血病中SDF-1/CXCR4、VEGF高表达并且相互之间存在有相关性，与白血病血管新生有关联。

关键词： 白血病 SDF-1/CXCR4轴 血管新生 VEGF

Abstract： Objective：To study the relationship of the SDF-1 level and the expression of CXCR4 axis with the angiogenesis in the bone marrow of patients with leukemia.Methods：Four-color multiparametric flow cytometry (FCM) with CD45/SSC gating was used to determine the expression of CXCR4 in the marrow of 55 patients with newly diagnosed leukemia who were chosen as subjects: dipl-antibody ELISA was used to detect SDF-1/VEGF, and the microvessel density (MVD) of bone marrow was determined by immunohistochemical (Envinson) two-step method.Multiple PCR method was used to detect the gene re-arrangement of IgH, TCRγ stains V and J domains; G-differential staining technique was used to carry out cytogentic karyotype analysis.Results：In the AML group, SDF-1 is(2145.21±329.45)pg/ml and the positive rate of CXCR4 expression is (60.01±18.5)%;in the ALL group SDF-1 is (2549.1±303.4) pg/ml and positive rate of CXCR4 expression is (70.22±12.73)%; in the CML group SDF-1 is (1929.72±253.8) pg/ml and the positive rate of CXCR4

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expression is (40.05±16.69)%; in the CRAL group SDF-1 is (2070.98±159.98) pg/ml and the positive rate of CXCR4 expression is (58.4±11.8)%.The remarkable increase in SDF-1 level and the expression rate of CXCR4 is suggestive of statistical significance (P<0.05).In the ALL group SDF-1 level and the expression rate of CXCR4 are higher than those in other groups.In the analysis of the correlated factors and the SDF-1 / CXCR4 expression in leukemia it is found that ALL has a correlation with WBC count in the peripheral blood (r=0.534; 0.567.P<0.01).Acute leukemia accompanied by extra-marrow infiltration has statistical significance (P<0.05).SDF-1 /CXCR4 expression in leukemia has no correlation with factors such as blood platelets count,age,gender bone marrow proliferation degree, chromosomal change， CD34 positive expression in the marrow cells in acute leukemia， gene re-arrangement in IgH， TCRγ stains V and J domains.The coefficient of correlation between SDF-1, CXCR4 and VEGF in the bone marrow of the leukemia patients is 0.552, 0.553 and 0.531, respectively (P<0.05).The three of them have significant correlation.Conclusion：The content of SDF-1 in bone marrow cells in leukemia and the content of CXCR4 in different cell groups such as initial cell,mature lymphocyte,monocyte and granulocyte are highly increased， with the highest expression of these factors in acute lymphocyte leukemia and the high expression after the relief of acute leukemia.The expression of SDF-1/CXCR4 is related to the WBC count in the peripheral blood in ALL and the extramarrow infiltration accompanying the acute leukemia. The high expression of SDF-1/CXCR4 and VEGF occurs in leukemia and has a correlation between them， and also has a correlation with angiogenesis in leukemia.

Key words： Leukemia SDF-1/CXCR4 axis Angiogenesis Vascular endothelial growth factor (VEGF)

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