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再生障碍性贫血患者Treg/Th17细胞失衡及脐带MSCs的调节作用

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Title: Imbalance of Treg/Th17 cells in patients with aplastic anemia and regulative role of umbilical cord-derived mesenchymal stem cells

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关键词: [再生障碍性贫血](#); [Treg细胞](#); [Th17细胞](#); [间充质干细胞](#); [流式细胞术](#)

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摘要: 目的 研究Treg/Th17细胞的平衡状态在再生障碍性贫血(aplastic anemia, AA)发病机制中的作用及意义,探讨脐带间充质干细胞(umbilical cord-derived mesenchymal stem cells, UC-MSCs)对AA患者外周血Treg/Th17比率的调节作用。 方法 体外分离、培养和鉴定UC-MSCs。流式细胞术(flow cytometry, FCM)检测10例健康对照者、15例AA患者外周血Treg细胞和Th17细胞分别占外周血单个核细胞(peripheral blood mononuclear cells, PBMCs)的百分比,比较Treg/Th17细胞的比率。将AA患者的PBMCs与UC-MSCs共培养72 h,检测AA患者单独培养组与MSCs共培养组Treg细胞、Th17细胞分别占PBMCs的百分比,比较Treg/Th17比率的变化。 结果 经FCM鉴定MSCs表面标记CD90、CD105 阳性率 $\geq 98\%$, CD34、CD45阳性率 $\leq 1\%$ 。AA患者组外周血Treg细胞百分率明显低于健康对照组($P < 0.05$), Th17细胞百分率明显高于健康对照组($P < 0.05$), Treg/Th17细胞比率明显低于健康对照组 ($P < 0.05$)。AA患者的PBMC与UC-MSCs共培养后, Treg细胞百分率明显高于单独培养组($P < 0.05$), Th17细胞百分率明显低于单独培养组($P < 0.05$), Treg/Th17细胞比率较单独培养组明显升高($P < 0.05$)。 结论 AA患者外周血存在Treg/Th17分化失衡; UC-MSCs可能通过抑制Th17细胞分化,诱导Treg细胞生成/聚集,使得其Treg/Th17的失衡在一定程度上得到恢复。

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Abstract: **Objective** To determine the role and significance of the balance of Treg/Th17 cells in pathogenesis of aplastic anemia (AA), and to investigate the regulatory effect of umbilical cord-derived mesenchymal stem cells (UC-MSCs) on the ratio of Treg/Th17 cells in patients with AA. **Methods** UC-MSCs were isolated, cultured and identified *in vitro*. Flow cytometry (FCM) was used to detect the percentage of Treg cells and Th17 cells in the peripheral blood mononuclear cells (PBMCs) from 10 healthy volunteers and 15 AA patients, respectively by FCM, and the ratio of Treg/Th17 cells was compared. After PBMCs of the patients with AA was cultured solely or co-cultured with UC-MSCs for 72 h, the percentages of Treg and Th17 cells in PBMCs, and the ratio of Treg/Th17 were compared respectively in the PBMCs in present or absent of UC-MSCs. **Results** FCM indicated that the obtained MSCs were $\geq 98\%$ positive to CD90 and CD105, and $\leq 1\%$ positive to CD34 and CD45. The percentage of Treg cells was significantly lower, while that of Th17 cells was significantly higher in the peripheral blood samples from AA patients than those from healthy control group ($P < 0.05$), and the ratio of Treg/Th17 cells was significantly lower in the patients than the normal control ($P < 0.05$). After the PBMCs from AA patients were co-cultured with UC-MSCs, the percentage of Treg cells was significantly higher, while the percentage of Th17 cells was significantly lower than those without co-culture ($P < 0.05$), and the ratio of Treg/Th17 cells was also significantly increased ($P < 0.05$). **Conclusion** There is a differential imbalance between Treg cells and Th17 cells in the peripheral blood from AA patients. UC-MSCs may regulate the imbalance by inducing the production and aggregation of Treg cells, and thus, restore the imbalance to some extent.

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