

Changing of CD133⁺CD45⁺ hematopoietic progenitor/stem cells and very small embryonic-like stem cells in children with growth hormone deficiency before and after one-year recombinant growth hormone therapy

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The authors have nothing to disclose.



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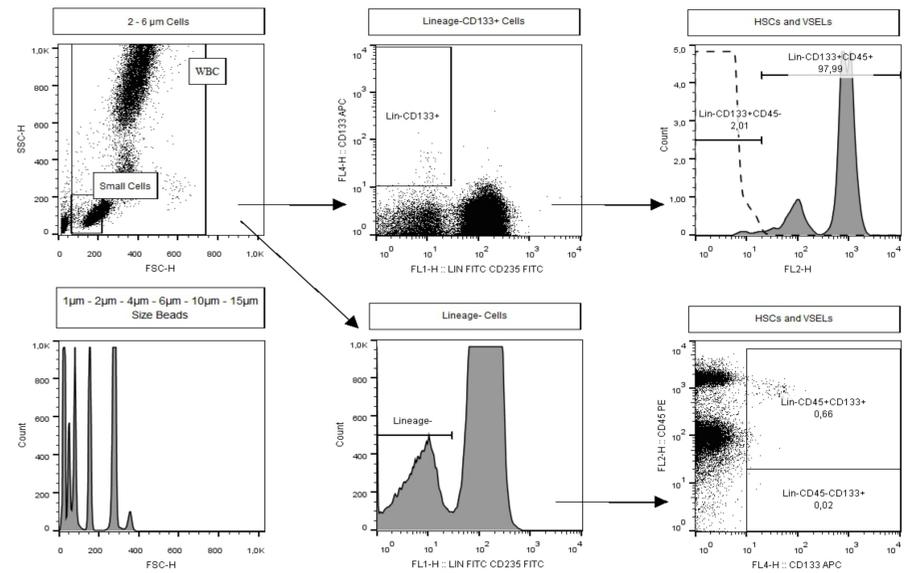
Background

Growth hormone pituitary gland that does not produce sufficient quantities of growth hormone (GH). GHD is treated by replacing GH with one daily injections. Recent studies suggested that GH could be involved in regulation of certain stem cell subset potential and function. However, the exact effects of GH therapy on biology of stem cells in pediatric patients were not studied in detail. Here we aimed to evaluate the levels of very small embryonic-like cells (VSELs) delineated by Lin-CD133⁺CD45⁻ phenotype and hematopoietic stem/progenitor cells characterized by Lin-CD133⁺CD45⁺ phenotype in relation to treatment with GH.

Patients and Methods

Study groups consisted of children with GH deficiency that were diagnosed with GHD but did not start GH therapy yet; children with GHD after one year treatment with rGH.

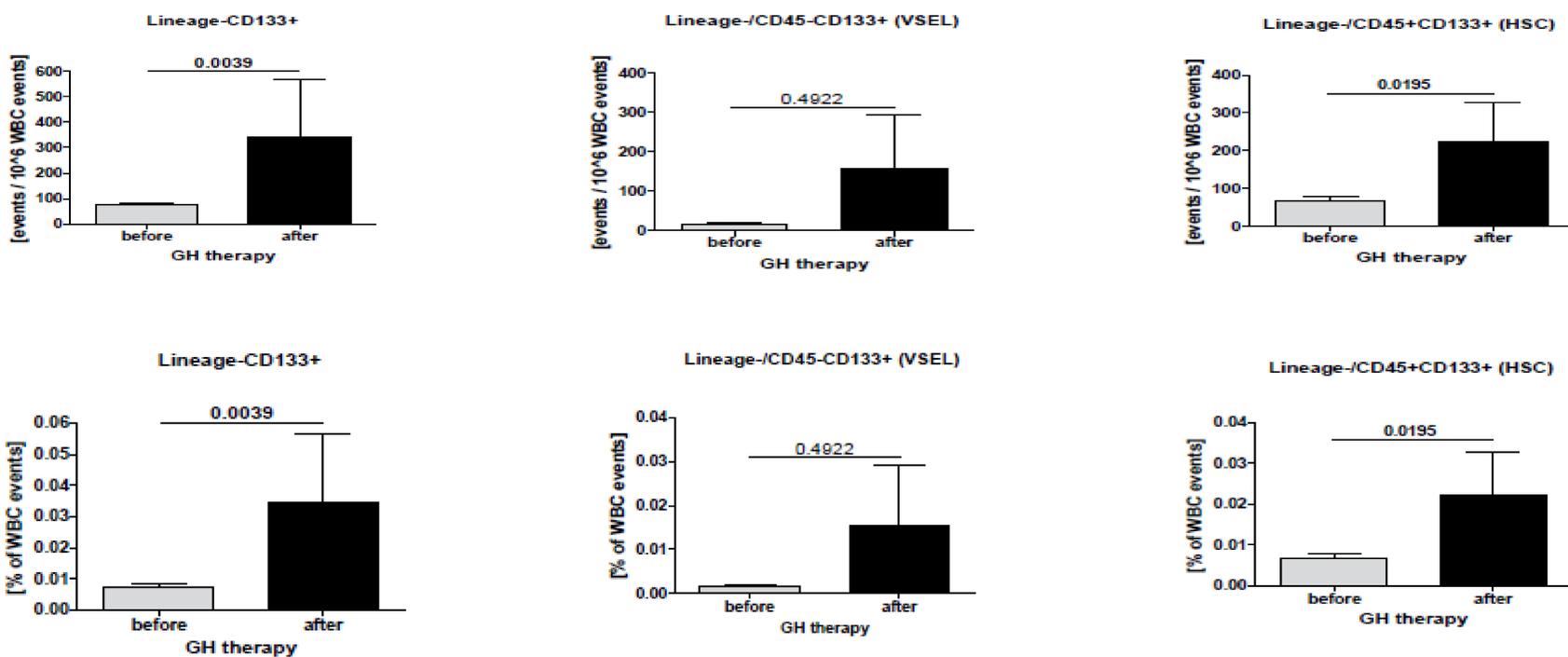
Peripheral blood samples were subjected to extracellular staining using fluorochrome-conjugated monoclonal antibodies: anti-CD235 FITC, anti-CD45 PE, anti-CD133 APC, and Lin 1 FITC mixture. Following incubation immunostained blood samples were incubated for with BD FACS Lysing Solution and washed twice to get rid of erythrocytes. VSEL were defined as CD45⁻CD133⁺, whereas HSC were defined as CD45⁺CD133⁺.



Results

A group of children with GHD who were treated with rGH presented higher level of VSEL than untreated GHD patients. Notably, VSEL and HSC levels were significantly higher in GHD patients treated with rGH than in group before treatment.

Cell Type	Markers
Hematopoietic stem cell	CD34, CD45, CXCR4
Endothelial Progenitors Cells	CD34, CD73, CD133, CXCR4, KDR, anti-M IgG
Very Small Embryonic Like Cell (VSEL)	CD34, CD133, CXCR4, SSEA4, anti-M IgG
Mesenchymal VSEL	CD34, CD45, CD90, CD105, CD106, CD44



Conclusions

In conclusion, rGH therapy in GHD pediatric patients can be associated with elevated of peripheral blood stem and progenitor cells. Further studies assessing the longevity of such phenomenon are still warranted.