LONG-TERM EFFECTS OF GH REPLACEMENT THERAPY ON HEMATOPOIESIS IN GH DEFICIENT CHILDREN

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BACKGROUND

Among their metabolic effects, GH and its mediator IGF-1 have been reported to influence hematopoiesis. Indeed, GH/IGF-1 axis promotes erythropoiesis and GH deficiency (GHD) has been associated with a normochromic and normocytic anemia both in adults and in children. In contrast, in vivo data on the effects of GH/IGF-1 axis on leukocytes and platelets are scanty.

OBJECTIVE

To evaluate the effects of four-years GH replacement therapy (GHRT) on hematopoiesis in GHD children.

METHODS

One hundred GHD children (64M) aged 9.74±3.95 years were enrolled in the study. Anthropometric measures, serum IGF-1 levels and blood count were evaluated at baseline and then annually during the first 4 years of GHRT. One hundred healthy children sex- and age-comparable to the patients were enrolled as controls and evaluated annually.

RESULTS

Clinical features of GHD patients and controls at baseline are reported in Table.

At the start of the study GHD children showed levels of hemoglobin (Hb) (12.5±1.1g/dl), hematocrit (Hct) (36.7±4.0%) and red cells number (RC) (4.62±0.41x10^6/mcl) lower than controls (Hb 13.0±1.0g/dl, p<0.002; Hct38.1±4.3%, p<0.02; RC 4.74±0.34x10^6/mc,p<0.01).

Four years of GHRT were associated with a significant increase in Hb (13.2±1.0g/dL, p<0.0001), Hct (39.0±3.4%, p<0.0001) an RC (4.75±0.41x10^6/mcl, p<0.05) which became comparable to controls (Hb 13.3±1.3g/dl; Hct 39.7±7.8%; RC 4.78±0.37x10^6/mcl).

Hb levels significantly correlated with IGF-1 serum levels (r = 0.32, p<0.0001).

Red cell parameters expressed in SDS in patients and controls throughout the study are showed in Figure.

At baseline seventeen GHD children (17%) showed a normochromic, normocytic anemia while after 4 years of GHRT only 2 patients (2%) were still anemic.

No difference in leukocytes and platelets count was detected between patients and controls neither at baseline nor during the study. A physiological reduction in leukocytes and platelets numbers was observed both in patients and in controls (Figure).

Table – Clinical features of GHD children and controls at baseline

	GHD children	Controls	p
Male /Female	64/36	64/36	NS
Age (years)	9.73±3.95	9.66±4.45	NS
Partial/Severe GHD	68/32	-	
Isolated/Multiple GHD	85/15	-	
Height (SDS)	-2.32±0.88	-1.00±1.30	<0.0001
BMI (SDS)	-0.41±1.23	-0.11±1.24	NS
IGF-1 (SDS)	-1.91±0.93	0.14±1.00	<0.0001

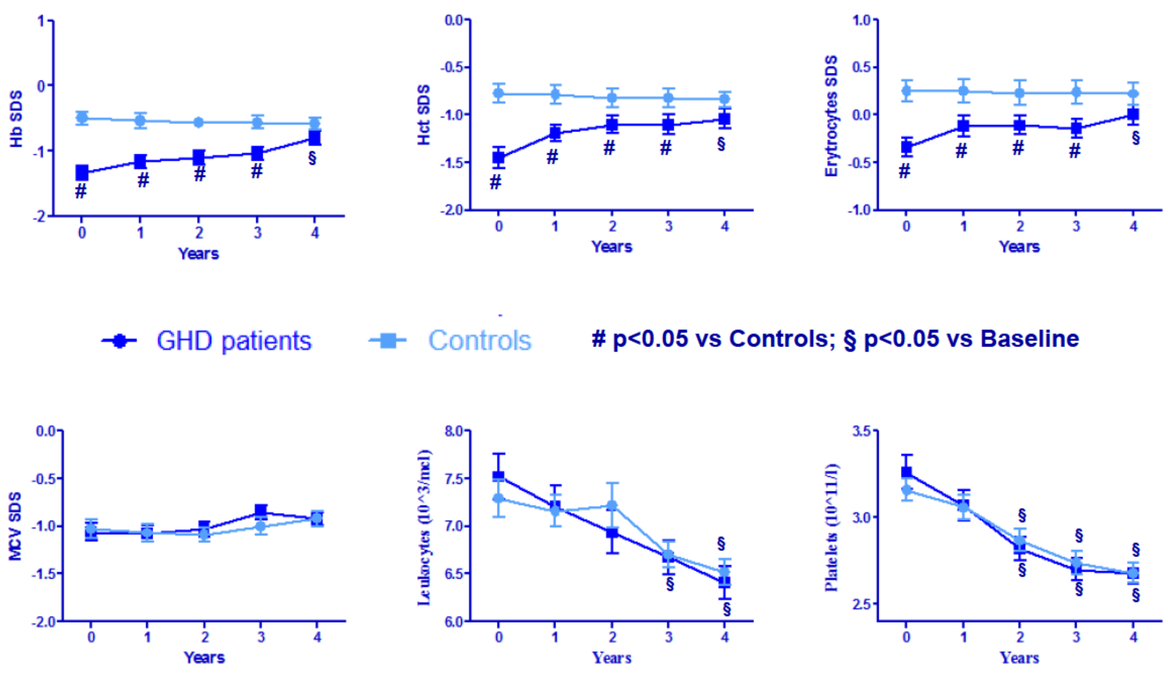

Figure – Red cells parameters, leukocytes and platelets counts in GHD patients and controls throughout the study

CONCLUSION

GHD in children is associated with a significant reduction in Hb, Hct and RC. Long-term GHRT improves these anomalies. Neither GHD nor GHRT have effects on leukocytes and platelets numbers.

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Growth Hormone

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