

# Decrease of small dense LDL and lipoprotein-associated phospholipase A2 due to human growth hormone treatment in short children with growth hormone deficiency and small for gestational age status

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## Objectives:

Growth hormone deficiency (GHD) and small for gestational age (SGA) status are associated with cardiovascular risks (1-4). We therefore investigated antiatherogenic effects of growth hormone (GH).

## Methods:

Subfractions of LDL and HDL, lipoprotein-associated phospholipase A2 (Lp-PLA2), and high-sensitivity C-reactive protein (hsCRP) were measured at baseline, after 8 and 52 weeks of GH treatment in 51 short children born SGA (n=33) or with GHD (n=18).

**Table 1** Characteristics of 51 children with growth hormone deficiency (GHD) or born small for gestational age (SGA)

	Baseline	8 weeks	52 weeks	P *
<b>GHD (n=18, male=12)</b>				
Age (yr)	9.0	-	9.9	-
Height SDS	-2.8	-2.6	-2.2	<0.001
Weight SDS	-1.9	-1.7	-1.38	0.001
Body mass index SDS	-0.24	-0.12	-0.35	NS
Systolic blood pressure (mmHg)	103	106	103	NS
Diastolic blood pressure (mmHg)	58	64	64	NS
HbA1c (%)	5.35	5.2	5.4	NS
<b>SGA (n=33, male=18)</b>				
Age (yr)	6.5	-	7.4	-
Height SDS	-2.7	-2.5	-2.1	<0.001
Weight SDS	-2.8	-2.8	-2.29	<0.001
Body mass index SDS	-1.3	-1.3	-1.11	NS
Systolic blood pressure (mmHg)	103	101	103	NS
Diastolic blood pressure (mmHg)	61	60	62	NS
HbA1c (%)	5.55	5.6	5.5	NS

**Table 3** Follow-up of inflammation- and growth factor-related parameters in 51 children with growth hormone deficiency (GHD, n=18) or born small for gestational age (SGA, n=33)

	Baseline	8 weeks	52 weeks	P *
<b>Lp-PLA2 (U/l)</b>				
Overall group	369.5	339.0	333.0	0.001
GHD	407.0	346.0	339.0	NS
SGA	367.0	331.5	328.5	0.002
<b>hsCRP (mg/l)</b>				
Overall group	0.60	0.20	0.30	0.005
GHD	0.80	0.30	0.50	NS
SGA	0.60	0.20	0.20	0.037
<b>IGF-1 (ng/ml)</b>				
Overall group	87.0	174.5	207.0	<0.01
GHD	51.5	112.0	120.0	<0.01
SGA	100.5	205.0	232.5	<0.01

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## Conclusions:

Children with GHD or born SGA may benefit from GH treatment by growth acceleration and simultaneous reduction of their latent cardiovascular long-term risk.

## Results:

For the overall group, we found post-treatment reductions of LDL cholesterol, small-dense LDL cholesterol, Lp-PLA2, and hsCRP, but increases of HDL2a cholesterol. SGA children showed reductions of small-dense LDL cholesterol Lp-PLA2, hsCRP and increases of HDL2a cholesterol. GH deficient children had non-significant decreases of small-dense LDL cholesterol, Lp-PLA2, hsCRP and increases of HDL2a cholesterol.

**Table 2** Follow-up of lipids (mg/dl) in children with growth hormone deficiency (GHD, n=18) or born small for gestational age (SGA, n=33)

		Baseline	8 weeks	52 weeks	P *
LDL-C	Overall group	87.9	82.4	78.4	0.016
	GHD	92.4	83.2	84.8	0.046
	SGA	85.9	81.6	75.9	NS
non-sdLDL-C	Overall group	65.6	64.8	61.0	NS
	GHD	67.4	64.8	67.4	NS
	SGA	65.6	63.4	57.3	NS
sdLDL-C	Overall group	21.3	18.7	17.9	<0.001
	GHD	21.5	18.8	18.3	NS
	SGA	20.7	18.0	17.3	0.020
HDL-C	Overall group	51.0	50.0	50.5	NS
	GHD	51.0	53.0	53.0	NS
	SGA	50.0	50.0	49.0	NS
HDL2a-C	Overall group	16.4	16.7	17.6	0.025
	GHD	16.4	16.0	17.2	NS
	SGA	16.4	17.0	17.8	0.004
HDL2b-C	Overall group	13.3	14.2	13.7	NS
	GHD	13.9	15.7	16.6	NS
	SGA	13.1	13.7	12.4	NS
HDL3-C	Overall group	14.1	13.3	12.7	NS
	GHD	14.4	13.0	11.6	NS
	SGA	14.1	13.3	13.1	NS
TG	Overall group	63.0	72.0	65.0	NS
	GHD	63.6	70.0	61.0	NS
	SGA	56.5	72.0	66.0	0.025

## References

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