

Decrease of jumping power in adolescents with severe GHD (sGHD) after stop of GH-therapy

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Background

Recently we demonstrated that male adolescents with sGHD had a significant decrease of lean body mass and increase in fat mass after stop of GH-therapy. The functional consequence of this observation is unknown.

Aim

The aim was to study the changes in parameters of jumping mechanography in adolescents with GHD in the transition period (end of growth) after stop of GH-therapy.

Conclusion

In GHD decrease of muscle mass is associated with a significant decrease of jumping power after 6 months.

Patients and Method

We studied 64 patients (17 girls) with idiopathic GHD. GH-therapy was stopped at the end of growth (height velocity <2 cm/year) to retest the GH-axis (age 16.4±1.5 yrs, height -0.5±0.9 SDS). At the end of GH-therapy and 6 months thereafter we performed jumping mechanography using the Leonardo ground-reaction-force-plate (NovoTec Medical, Germany). We analyzed peak jump power (PJP in W), PJP/kg body weight (in W/kg) and time in air (tAir in sec.). sGHD was defined as GH peak in Arg-GHRH-Test <16 ng/ml and IGF-I <-1 SDS (for basal characteristics see Table).

Results

Thirteen patients had sGHD and in 51 patients GHD was transitory (tGHD). Prior to stop of GH in both patient groups PJP, PJP/kg and tAir were similar (2.7 vs. 2.5 W and 46.6 vs. 43.0 W/kg and 0.467 vs. 0.447 sec. in tGHD vs. sGHD). After stop of GH in sGHD patients PJP, PJP/kg and tAir decreased significantly ($\Delta=-0.17$ W, -3.33 W/kg and -0.019 sec., $p<0.01$), in tGHD patients PJP, PJP/kg and tAir did not change significantly ($\Delta=0.01$ W, -0.69 W/kg and 0.000 sec.) (Fig. 1).

There were no significant differences in changes between boys and girls. Peak GH did not correlate significantly with change in PJP, PJP/kg and tAir, but it correlated significantly with PJP/kg ($r=0.27$, $p=0.0332$) and, only in boys, with tAir ($r=0.33$, $p=0.021$) 6 months after stop of GH (Fig. 2).

Patient characteristics

	sGHD mean	SD	tGHD mean	SD	p=
Age [yrs]	16.29	1.82	16.39	1.44	0.86
Height [SDS]	-0.14	1.08	-0.62	0.85	0.16
BMI [SDS _{LMS}]	-0.54	0.89	-0.23	0.76	0.28
Peak in test before GH therapy [ng/ml]	3.61	1.85	6.26	1.96	<0.001
Peak in Arg-GHRH-test [ng/ml]	9.56	7.03	35.35	19.28	<0.001
IGF-I 6 months after stop of GH [ng/ml]	165.00	52.41	276.31	65.06	<0.001

sGHD= severe GHD; tGHD= transitory GHD

Results

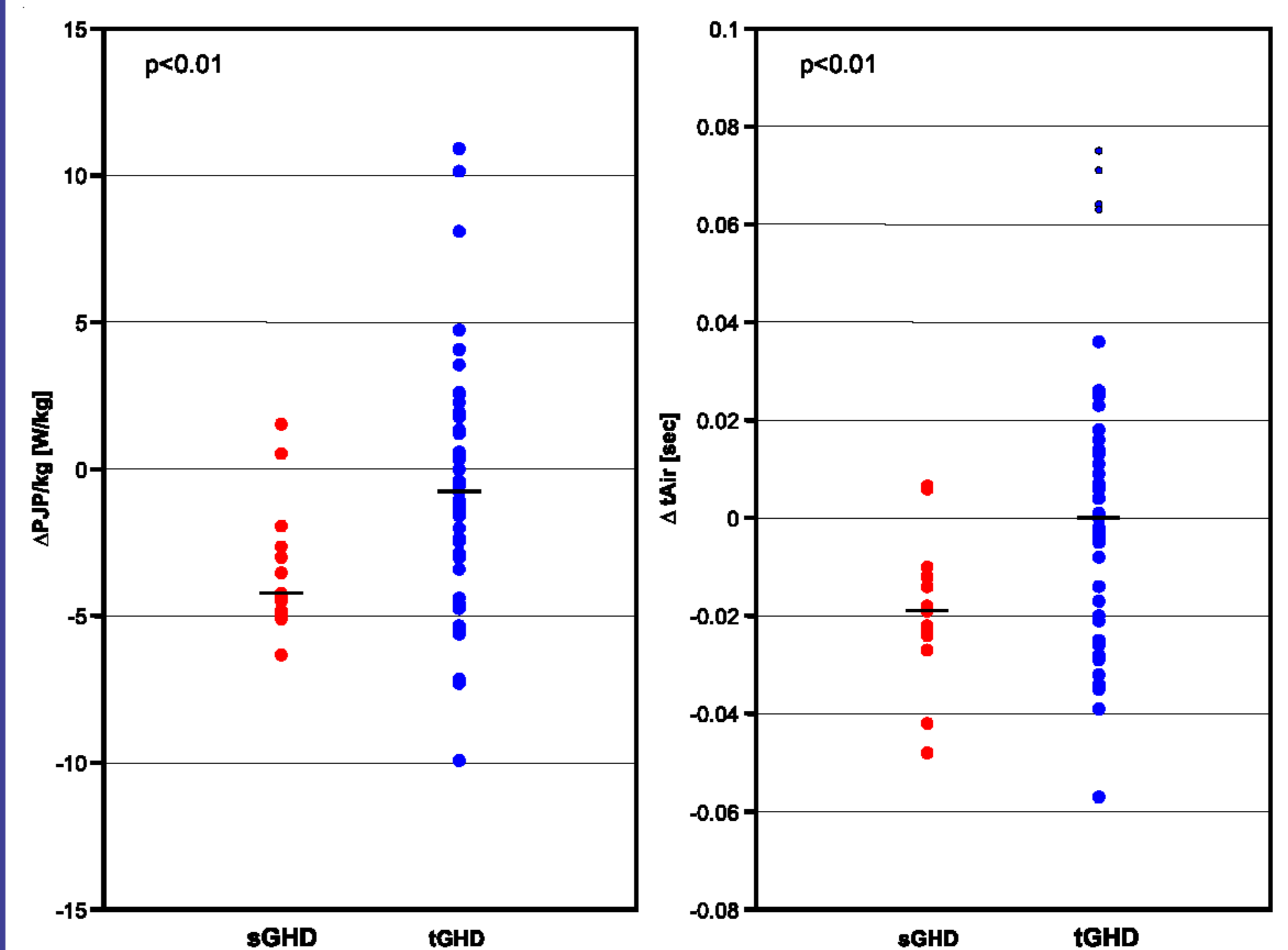


Figure 1

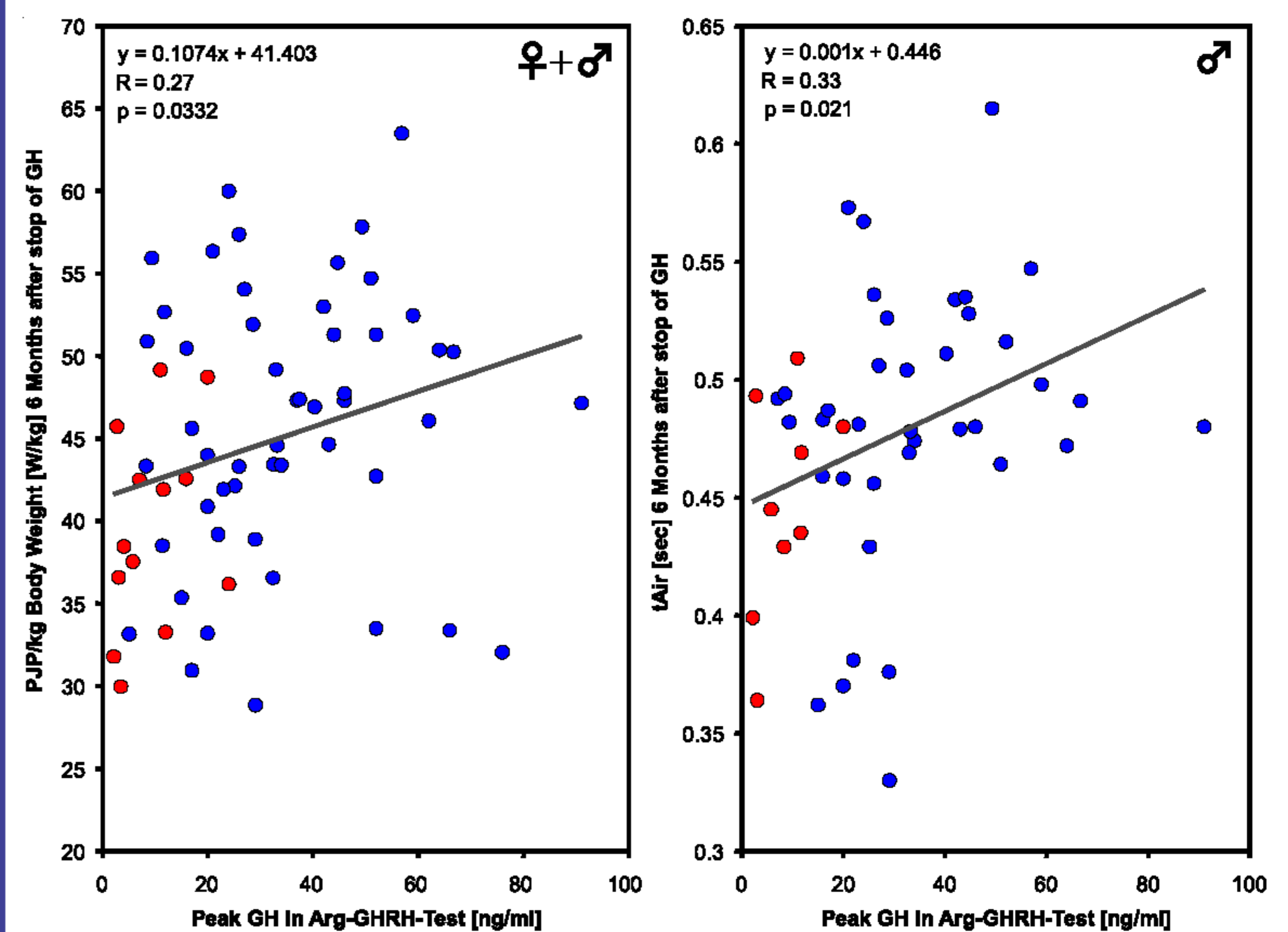


Figure 2

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Conflicts of Interest: R.S. and G.B. got presentation fees from Pfizer, Lilly, NovoNordisk

