



The Effect of Long Term Growth Hormone Therapy in Discordant Twins Where One Twin is Born Small for Gestational Age: A Case Control Study



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Introduction: The positive effect of growth hormone (GH) therapy in small for gestational age (SGA) singletons has been shown in previous studies. Little is known about twin growth and growth hormone treatment where only one twin is born SGA. We present growth and body composition data from 2 sets of twins where one was appropriate for gestational age (control) and the other twin was born SGA (GH treatment).

Objective and hypotheses: We present growth and body composition data from 2 set of twins where one was appropriate for gestational age (control) and the other twin was born SGA and treated with GH.

Method:

Twin pair 1: Male monozygotic diamniotic (MCDA) twins born at 33 weeks gestation.

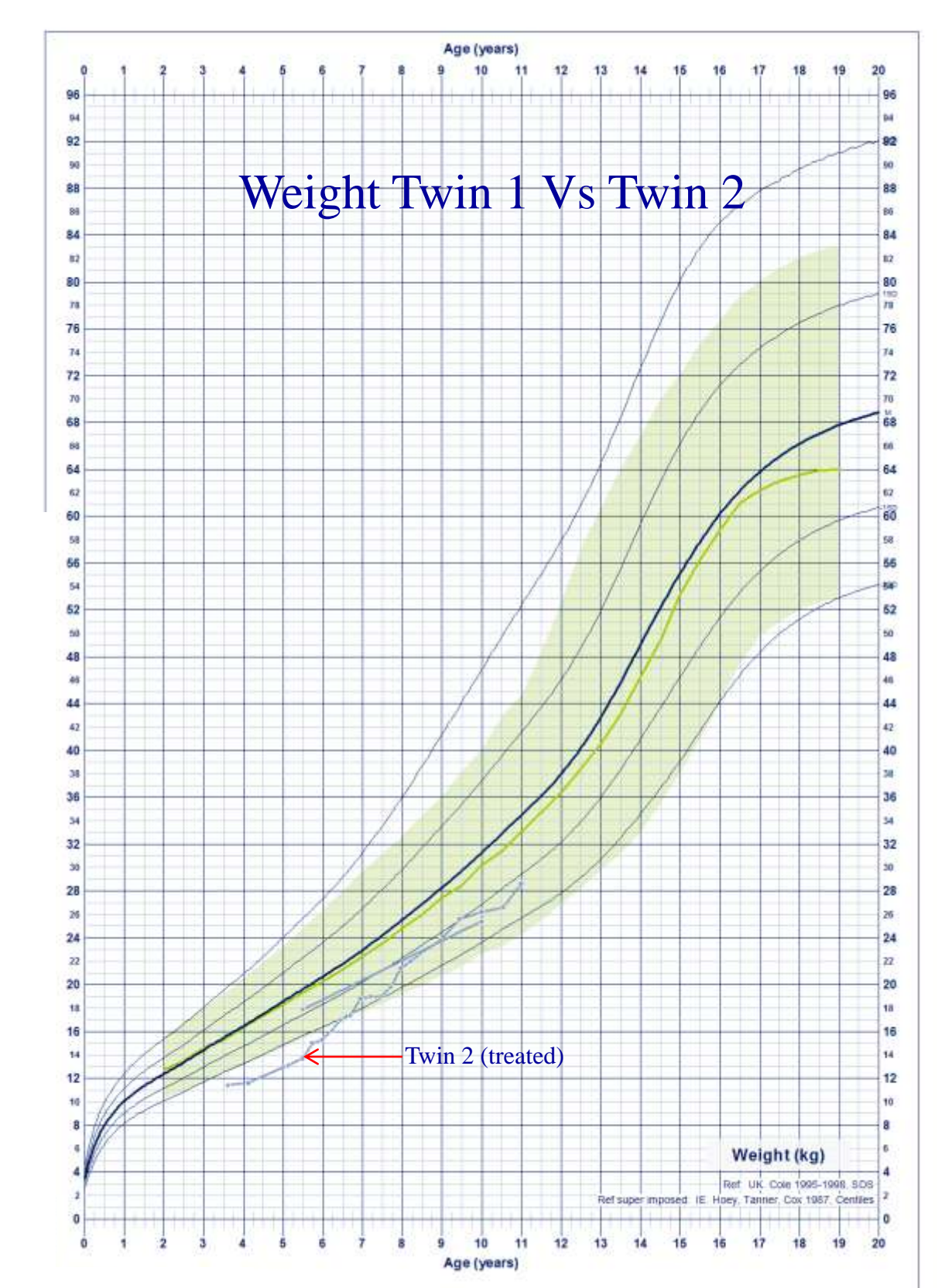
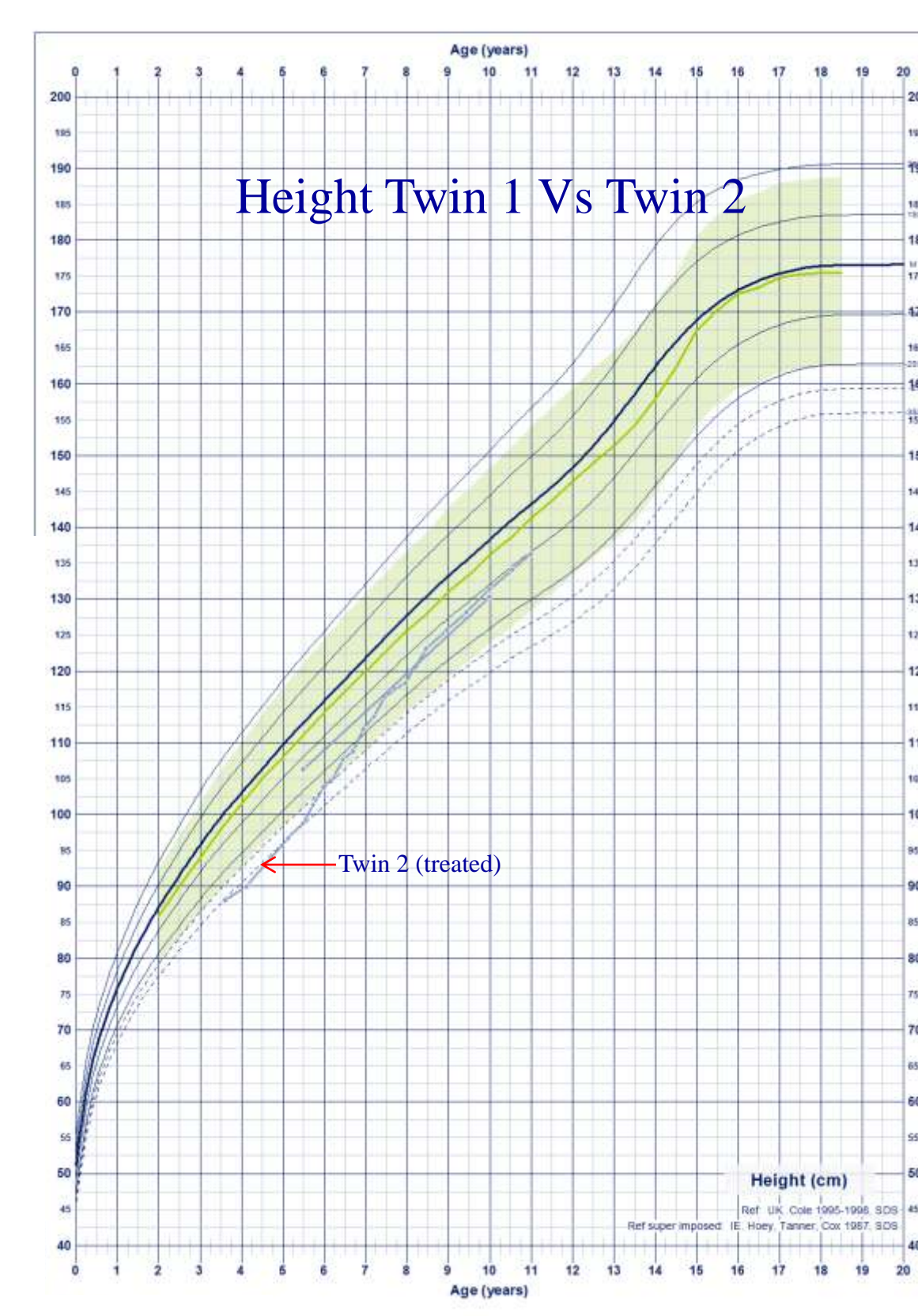
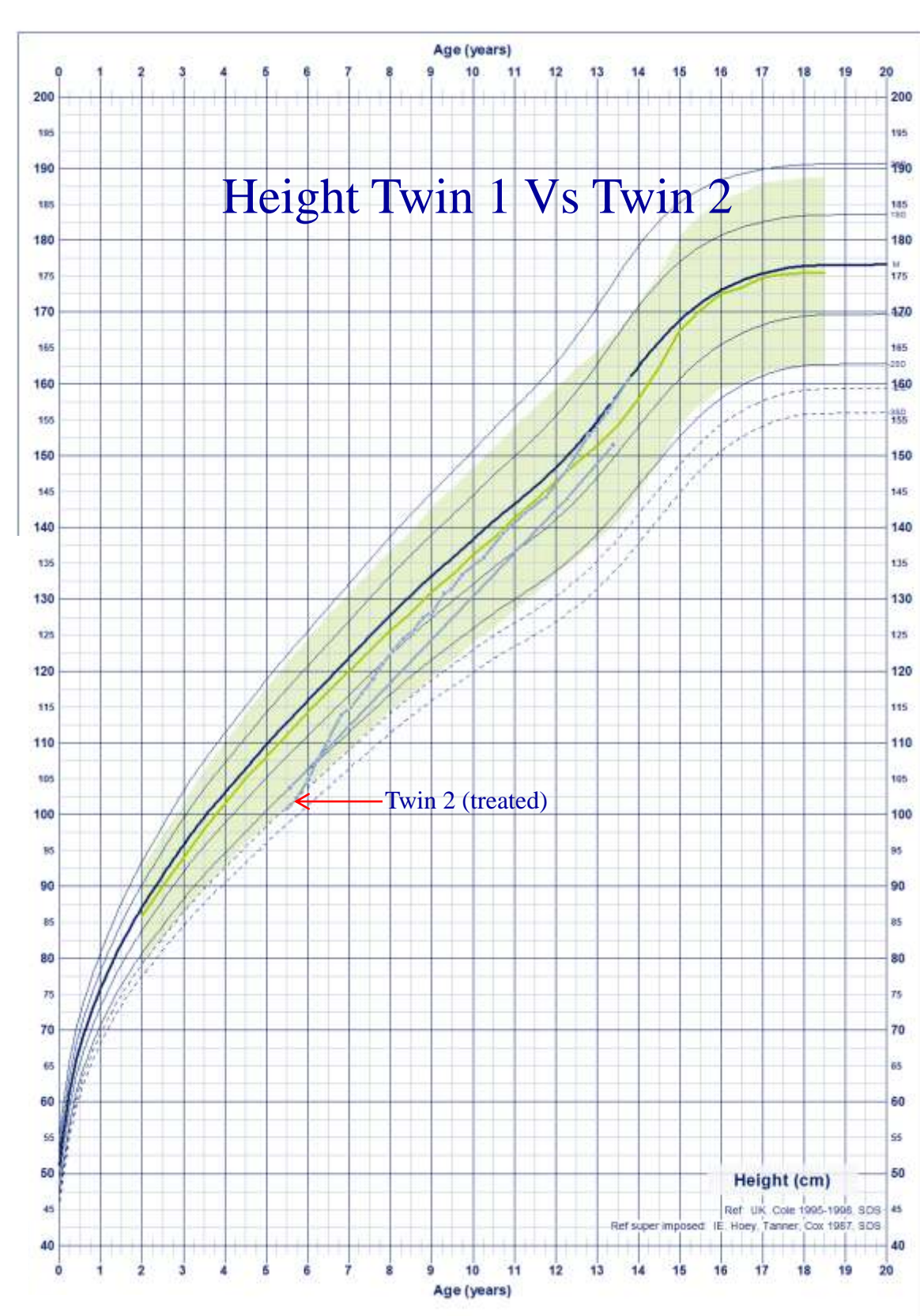
Pre-GH treatment: Twin 2 peak GH 5.1 (mcg/L), normal IGF-1, height velocity 6.0cm/yr. GH therapy commenced at 6yrs.

Twin pair 2: Male dichorionic diamniotic (DCDA) twins born at 35 weeks gestation.

Pre-GH treatment: Twin 2 peak GH 17.9 (mcg/L), normal IGF-1, height velocity 5.8cm/yr. GH treatment commenced at 5.5yrs.

Twin Pair 1	Birth Weight	Height Pre-GH treatment
Twin 1 (Control)	1.5 kg (-1.15 SD)	103.7cm (-0.8 SD)
Twin 2 (Treated)	1.0 kg (-2.93 SD)	100.8cm (-2.55 SD)

Twin Pair 2	Birth Weight	Height Pre-GH treatment
Twin 1 (Control)	2.3 kg (-0.89 SD)	106.3 (-1.36 SD)
Twin 2 (Treated)	1.62 kg (-2.96 SD)	98.8cm (-2.94 SD)



Twin Pair 1	Height post 6.5yrs GH treatment
Twin 1 (Control)	151.1cm (-0.08 SD)
Twin 2 (Treated)	157.4cm (-0.04 SD)

Twin Pair 2	Height post 4.5yrs GH treatment
Twin 1 (Control)	130.0cm (-1.29 SD)
Twin 2 (Treated)	131.4cm (-1.11 SD)

Patient	Twin Pair 1- Twin 2 (treated)			Twin Pair 2- Twin 2 (Treated)		
	Fat Mass %	Lean Mass kg	Total Mass kg	Fat Mass %	Lean Mass kg	Total Mass kg
Baseline	7.6	8.97	9.94	7.5	9.21	10.21
Year 1	5.3	14.76	16.18	6.2	12.21	13.38
Year 3	6.6	16.44	18.14	6.5	16.72	18.45
Year 4	6.6	18.94	20.93	7.5	18.69	20.9
Year 5	11.0	19.67	22.85	8.2	19.8	22.34

Conclusion: GH resulted in an increase in height and weight velocity, enabling the SGA twin to fulfill its genetic potential. DXA scan showed an increase in lean body mass and decrease in fat composition. Further research is needed on growth in pre- and early post- natal development and long term outcomes of twins including environmental epigenetic influences.

References:

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