

The authors have nothing to disclose

BACKGROUND

- Telomere length at birth is a major determinant of telomere length at later ages, up into senescence. However, the prenatal setting of telomere length is poorly understood.
- Individuals born large are at lower risk for later-life disorders, such as diabetes, than those born small, a feature of their longer health span being a higher lean mass that provides more muscle strength and is already present in infancy.

AIM

- To assess leukocyte telomere length (LTL) in small-, appropriate- or large-for-gestational-age (SGA, AGA, LGA) infants.
- To correlate LTL at birth with body composition at age 12 months.

SUBJECTS AND METHODS

- At birth, LTL (by real-time PCR, using RNaseP as a single copy gene), was assessed in 103 SGA, AGA and LGA newborns born after an uneventful, term, singleton pregnancy.
- At age 2 weeks and 12 months, body composition was assessed by absorptiometry. All infants were breastfed for ≥4 months.

RESULTS

Table 1. Data from LGA, AGA and SGA infants and their mothers

	At Birth			P	At Age 12 Months			P	Changes between Birth and 12 Months			P
	SGA n=27	AGA n=42	LGA n=34		SGA n=16	AGA n=21	LGA n=23		SGA n=16	AGA n=21	LGA n=23	
Maternal age at conception (yr)	32.7 ± 0.9	33.5 ± 0.8	35.7 ± 0.8	0.56	--	--	--	--	--	--	--	--
Pre-gestational BMI (Kg/m <sup>2</sup> )	21.7 ± 0.6	23.2 ± 0.5	27.6 ± 0.9	<0.0001	--	--	--	--	--	--	--	--
Gestational weight gain (Kg)	12.0 ± 0.9	13.5 ± 0.8	13.7 ± 0.8	0.35	--	--	--	--	--	--	--	--
Gestational age (wk)	38.7 ± 0.3	39.9 ± 0.2	40.2 ± 0.2	<0.0001	--	--	--	--	--	--	--	--
Weight (Kg)	2.3 ± 0.05	3.4 ± 0.04	4.3 ± 0.04	<0.0001	8.1 ± 0.2	9.3 ± 0.2	10.5 ± 0.2	<0.0001	5.8 ± 0.2	6.0 ± 0.2	6.1 ± 0.2	0.43
Length (cm)	45.5 ± 0.4	50.4 ± 0.3	52.5 ± 0.3	<0.0001	72.6 ± 1.4	75.0 ± 0.8	74.8 ± 0.8	0.19	27.5 ± 1.7	25.2 ± 0.8	22.2 ± 0.9	0.004
Weight Z-score	-2.3 ± 0.1	0.1 ± 0.1	2.6 ± 0.1	<0.0001	-1.7 ± 0.2	-0.7 ± 0.1	0.4 ± 0.2	<0.0001	0.6 ± 0.2	-0.6 ± 0.1	-2.2 ± 0.2	<0.0001
Length Z-score	-1.9 ± 0.2	0.1 ± 0.2	1.3 ± 0.1	<0.0001	-0.9 ± 0.5	-0.1 ± 0.3	0.0 ± 0.3	0.19	1.1 ± 0.7	0.1 ± 0.3	-1.3 ± 0.4	0.001
LTL (Normalized T/S ratio)	0.75 ± 0.06	1.00 ± 0.06	1.26 ± 0.07	<0.0001	--	--	--	--	--	--	--	--
with P adjusted for maternal age, BMI, gestational weight gain, and gestational age				0.001	--	--	--	--	--	--	--	--

Figure 1. Boxplots (medians and interquartile ranges) of telomere length (expressed as normalized T/S ratio) at birth in 103 LGA, AGA and SGA infants. Whiskers represent centiles 10 and 90.

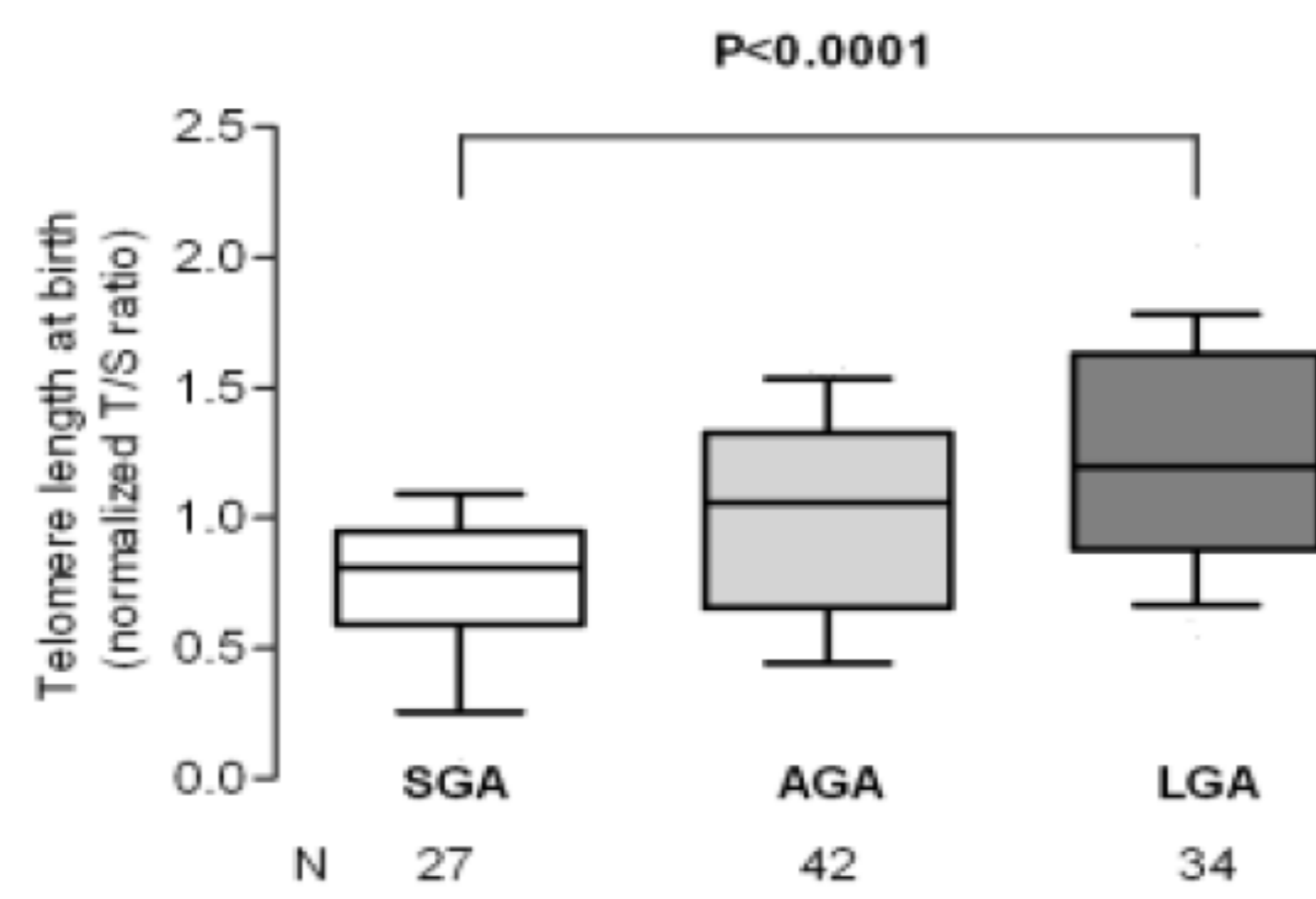


Figure 3. Correlation between LTL at birth and birthweight in 103 LGA, AGA and SGA infants.

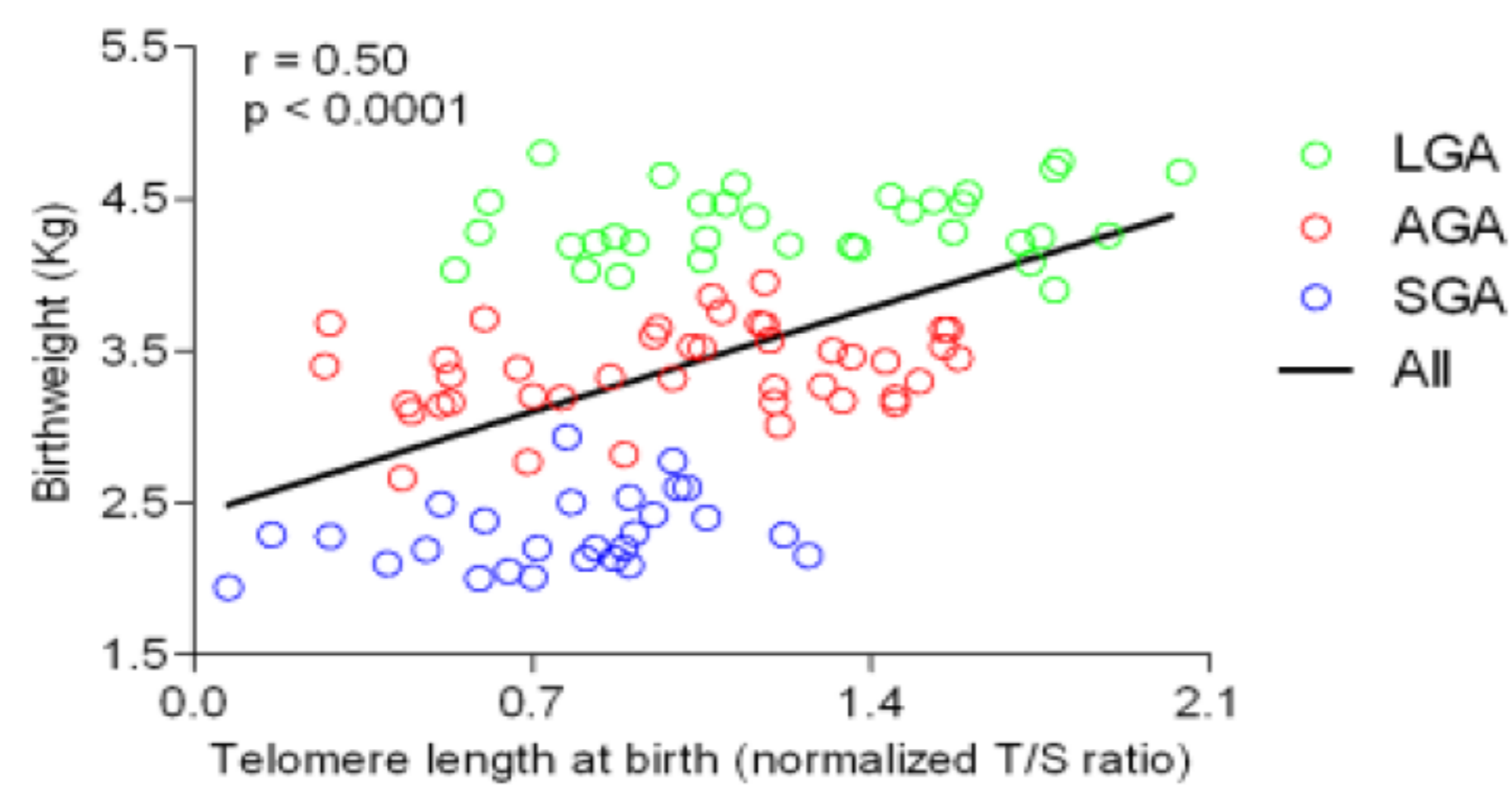
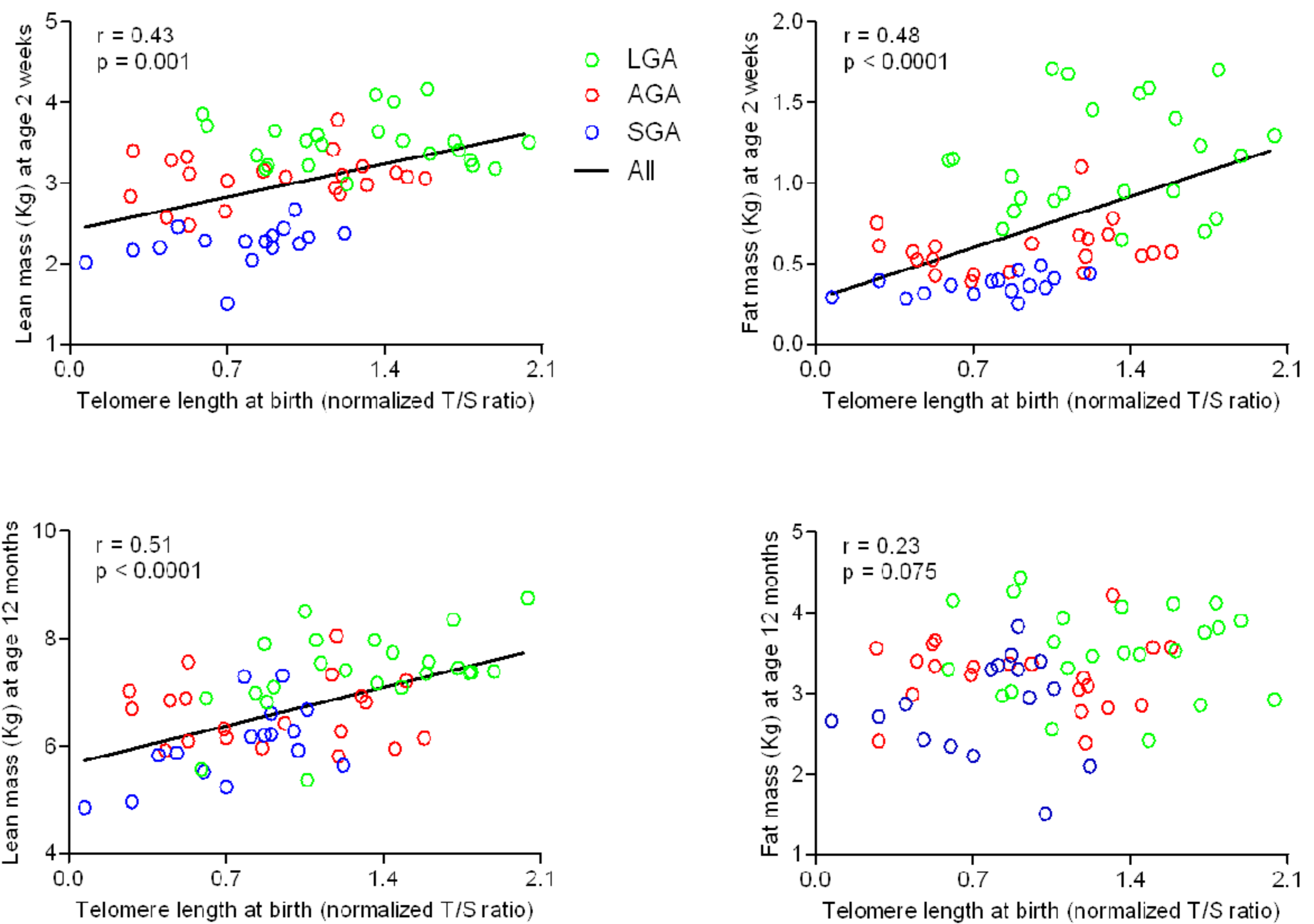


Figure 2. Correlations between LTL at birth (expressed as normalized T/S ratio) and, respectively, lean mass (left panels) and fat mass (right panels) at ages 2 weeks (upper panels) and 12 months (lower panels), in the same 60 LGA, AGA and SGA infants.



CONCLUSION

- Higher weight and longer telomeres at birth are followed by more lean mass in late infancy.
- Relatively large, breastfed infants from non-diabetic mothers may become models of how to make a healthy start

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