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BACKGROUND

Body Mass Index index not allow to discriminate the proportional composition of the different body compartments: fat mass and fat-free mass.

OBJECTIVE

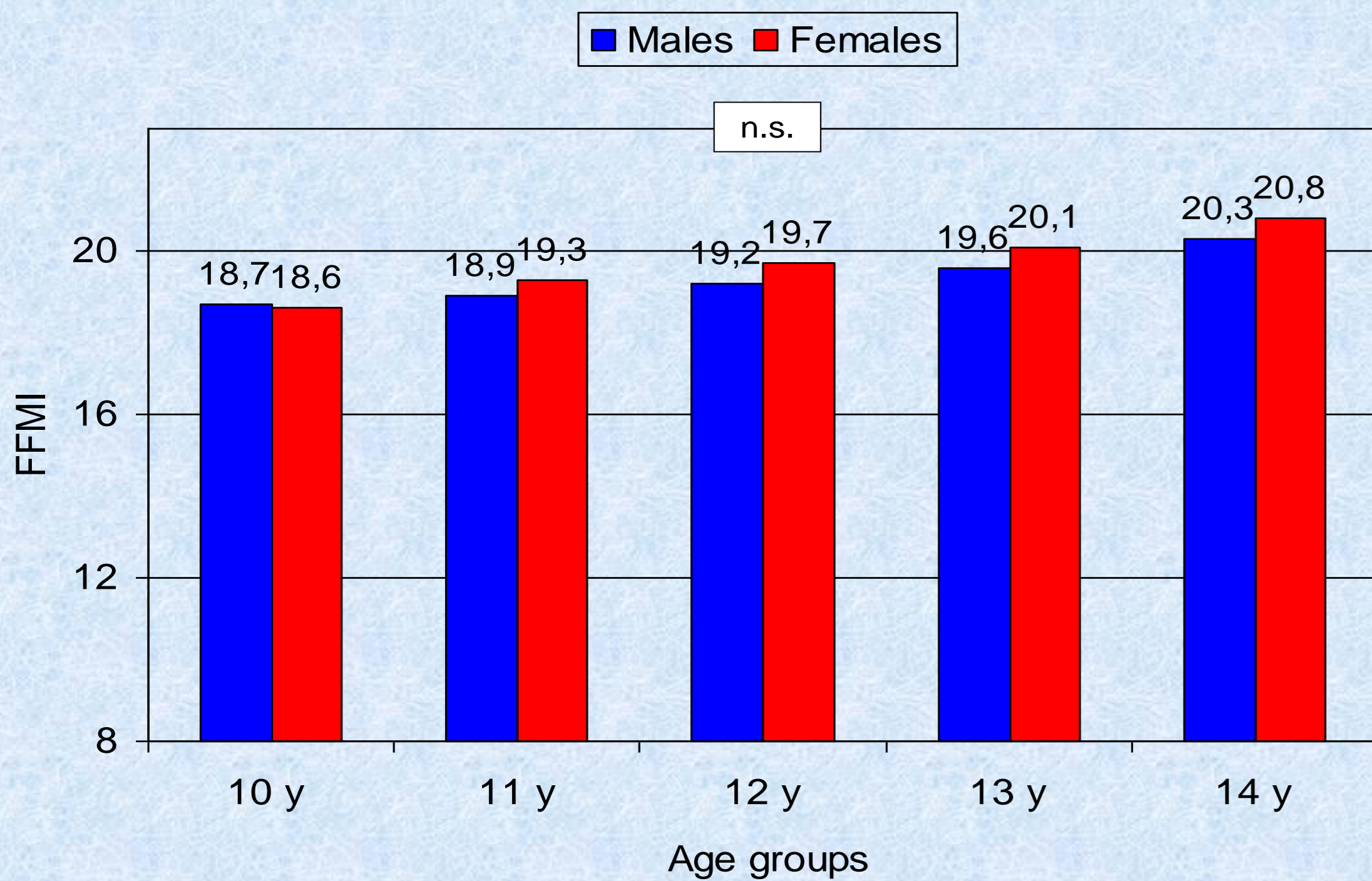
The aim of this study is to to elaborate standardized values of the Fat Mass Index (FMI) and Fat-Free Mass Index (FFMI) in healthy adolescents (both sexes) using anthropometric techniques in order to be available as reference standards in daily clinical practice.

SUBJECTS/METHODS

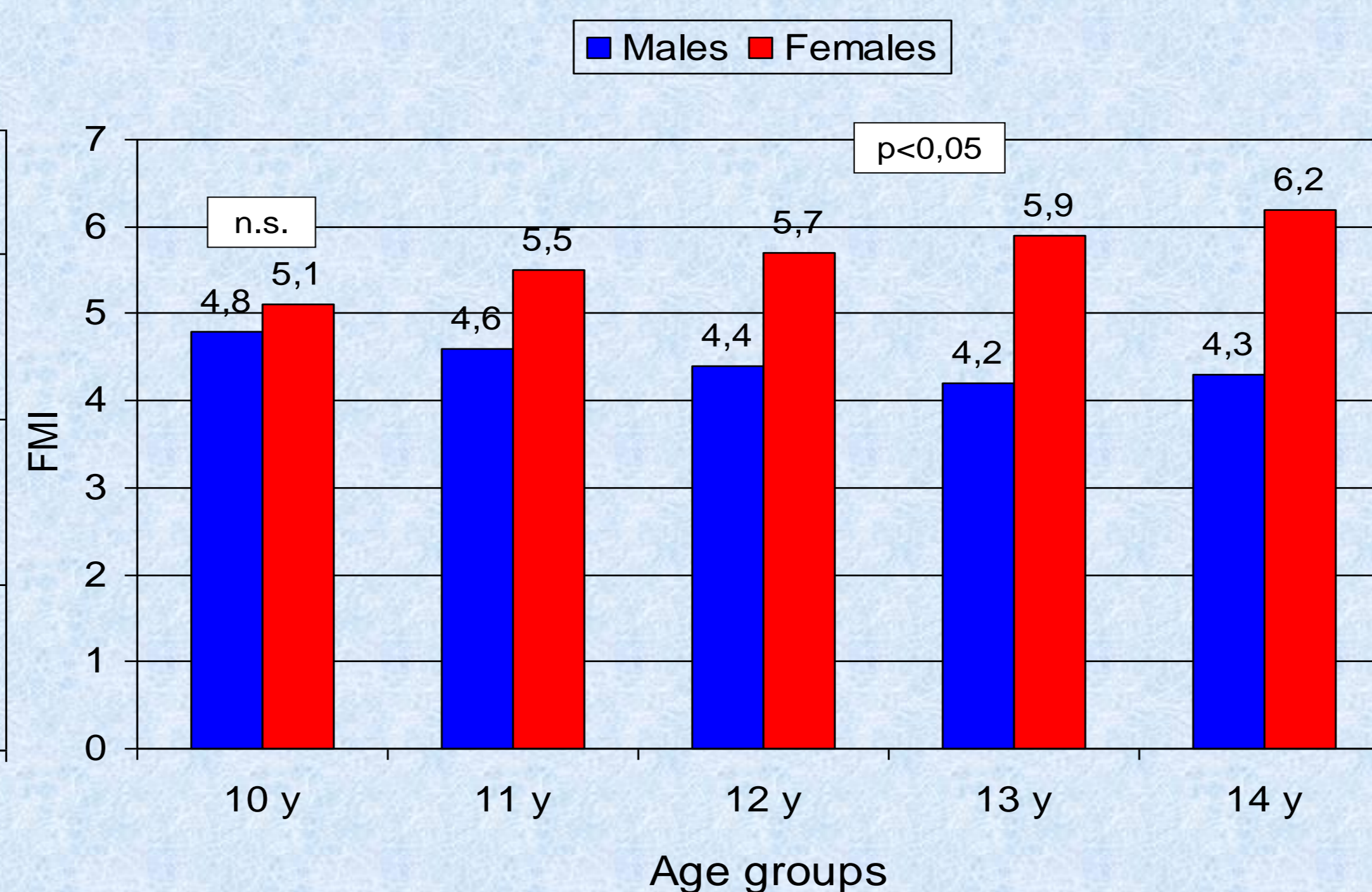
Transversal study in 940 healthy Caucasian adolescents (370 males and 570 females), aged 10.1 to 14.9 years. Weight, height, skinfold thickness (biceps, triceps, subscapular and suprailiac) were registered, and body mass index (BMI), percentage of total body fat, FMI and FFMI, and percentile distribution of FMI and FFMI were calculated.

RESULTS

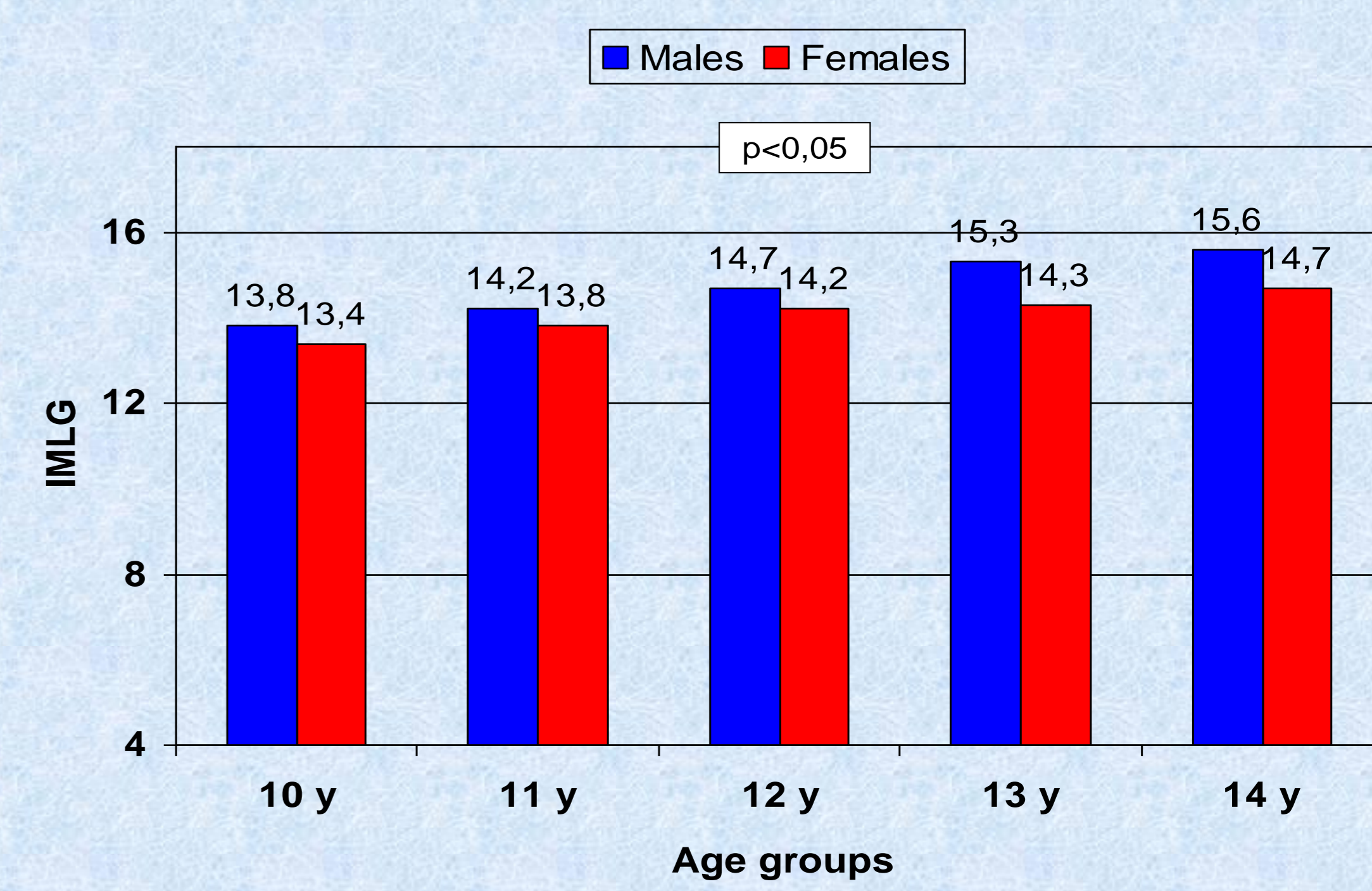
Gender differences for BMI in each of the ages



Gender differences for FMI in each of the ages



Gender differences for FFMI in each of the ages.



These changes (FMI and FFMI) take place simultaneously with a progressive increase in BMI in both sexes in this period of life, in the absence of significant differences of BMI values in both sexes in the different ages considered.

Percentil values for FMI and FFMI index in adolescent females

Fat mass index (kg/m ²)							
Age	p3	p10	p25	p50	p75	p90	p97
10 y	2.79	3.46	3.92	5.33	6.24	7.31	7.74
11 y	3.57	3.77	4.68	5.49	6.30	7.21	7.89
12 y	3.75	4.12	4.68	5.18	6.40	7.33	7.88
13 y	3.89	3.99	4.83	5.91	7.07	7.79	7.90
14 y	4.08	4.80	5.02	6.46	6.99	8.28	8.60

Fat-free mass index (kg/m ²)							
Age	p3	p10	p25	p50	p75	p90	p97
10 y	12.05	12.31	12.84	13.54	14.04	14.53	14.91
11 y	12.48	12.79	13.17	13.87	14.39	14.86	15.52
12 y	12.86	13.04	13.54	14.29	15.07	15.76	16.31
13 y	12.77	12.78	13.62	14.21	14.45	16.12	16.35
14 y	12.84	13.00	13.87	14.88	15.61	16.00	16.55

Percentil values for FMI and FFMI index in adolescent males

Fat mass index (kg/m ²)							
Age	p3	p10	p25	p50	p75	p90	p97
10 y	2.78	2.85	3.79	4.29	6.25	7.32	7.45
11 y	2.47	2.86	3.58	4.22	5.91	6.93	7.45
12 y	2.17	2.90	3.38	4.15	5.57	6.54	7.46
13 y	2.15	2.48	3.09	4.10	5.56	6.52	6.81
14 y	2.21	2.38	3.07	4.61	5.82	6.76	6.95

Fat-free mass index (kg/m ²)							
Age	p3	p10	p25	p50	p75	p90	p97
10 y	12.25	12.90	13.45	13.93	14.28	14.8	15.12
11 y	12.75	13.10	13.74	14.39	14.86	15.57	15.85
12 y	13.28	13.33	13.96	14.84	15.41	16.35	16.61
13 y	13.38	14.27	14.61	15.32	15.81	17.11	17.85
14 y	14.35	14.81	15.31	15.51	16.17	16.91	17.44

Therefore, having in place standardized values of FMI and FFMI in healthy adolescents would allow to distinguish between those individuals that, for example, present with high values of BMI and, simultaneously, show a low FFMI and high FMI (a situation that corresponds with overweight or obesity), and those that also present with high BMI but show high FFMI and low FMI (a situation that would be identified as muscle hypertrophy, which is quite frequent in adolescent males).

CONCLUSIONS

As a conclusion, having an easy access to standardized values of FMI and FFMI (made from the measurements of skin folds) that might be valid as referent patterns in healthy adolescents of both sexes would be a very useful instrument in clinical practice for the diagnosis and, especially, the analysis of body changes that might take place during the treatment of childhood obesity.

