light clothes. e height was measured to the nearest 0.1 cm. Waist

Table 1: Clinical and laboratory parameters of study subjects.

Clinical and laboratory parameters	Study subjects(n=207)	Percentage (%)
Obese	168	(81.16%)
Overweight	3J	(18.84%)
Systolic Blood Pressure above 90th centile	13	(6.28%)
Diastolic Blood Pressure above 90[th]centile	11	(5.31%)
High cholesterol	58	(28.02%)
High Triglycerides	Ì3	(40.10%)
High Low density lipoprotein	58	(28.02%)
Low High density lipoprotein	62	(29.95%)
Dyslipidemia	149	(71.98%)
Impaired fasting glucose	22	(10.63%)
Abnormal HbA1c	66	(31.ÌÌ%)
Abnormal HOMA-IR	111	(53.62%)
Hyperinsulinemia	42	(20.29%)
Metabolic syndrome	51	(24.64%)
Positive C reactive protein	37	(17.87%)
Fatty liver	113	(54.59%)
&æ¦[cïå î}cï{ æ { ^âïæ c@ï&\}^•• Üï*@cNJ5[th] centile	77	(37.1J%)
&æ¦[cïå î}cï{ æ { ^âïæ c@ï&\}^•• Š^-cNJ5[th] centile	73	(35.27%)
&æ¦[cïå î}cï{ æ { ^âïæ c@ï&\}^•• à[c@NJ5[th] centile	62	(29.95%)
T^æ} &æ¦[cïå î}cï{ æ { ^âïæ c@ï&\}^•• NJ5[th] centile	69	(33.33%)
Microalbuminuria	42	(20.29%)
Abbreviations: HOMA-IR- homeostatic model assessment-insulin resistance, HbA1c- Hemoglobin A1c		

Table 2: Ö^{ [*¦æ]@ï&/æ}c@¦[][{ ^c¦ï&~æ&c[¦   ˆ   ¦[][{ ^c¦ï&/æ}c@¦[][{ ^ ,

	Normal UACR (n=165)	Microalbuminuria (n=42)	p value
Demographic/anthropometric factors			
Age (years) Mean (95% CI)	J.J2 (J.5 . 10.33)	9.68 (8.67 – 10.68)	0.62
Sex % Female (n)	36.J7 (61)	45.24 (19)	0.326
ÓTɒ (*/{2) T^æ} (J5% Ôɒ)	24.2 (23.7 . 24.7)	24.1 (23.01 . 25.2)	0.Ì35
Waist Hip Ratio Mean (95% CI)	1.01 (1.002 – 1.02)	1.01 (0.998 – 1.02)	0.68
Waist Height R Mean (95% CI)	0.62 (0.61 . 0.623)	0.62 (0.59 – 0.64)	0.964
Pre puberty	96(58.18%)	22(52.3Ì%)	0.498
puberty	65(3J.3J%)	16(3Ì.10%)	0.878
Post puberty	4(2.42%)	4(9.52%)	0.056
Family History of obesity	112(67.88%)	27(64.29%)	0.658
Family History of Hypertension	106(64.24%)	25(59.52%)	0.571
Family History of dyslipidemia	ÌÌ(53.33%)	23(54.76%)	0.868
Family History of Diabetes mellitus	112(67.88%)	33(7Ì.57%)	0.177
Family History of heart attacks	68(41.21%)	14(33.33%)	0.351
Cardiometabolic parameters			
High Systolic blood pressure	10(6.06%)	3(7.14%)	0.796
High Diastolic blood pressure	9(5.45%)	2(4.76%)	0.858
High cholesterol	45(27.27%)	13(30.J5%)	0.635
Elevated Triglycerides	66(40%)	17(40.48%)	0.955
Elevated Low density lipoprotein	45(27.27%)	13(30.J5%)	0.635
Low High density lipoprotein	47(28.48%)	15(35.71%)	0.361
Dyslipidemia	109(66.06%)	30(71.43%)	0.508
Impaired Fasting Glucose	15(9.09%)	7(16.67%)	0.166
High HbA1c	54 (32.7%)	13 (31%)	0.826
Insulin resistance	87(52.72%)	24(57.14%)	0.608
Hyperinsulinemia	30(1Ì.1Ì%)	12(28.57%)	0.135
Metabolic syndrome	37(22.42%)	14(33.33%)	0.169
Positive C reactive protein	31(1Ì.7J%)	6(14.29%)	0.497
Fatty liver	ÌJ(53.J4%)	24(57.14%)	0.71
High cIMT Right	55(33.33%)	22(52.3Ì%)	0.022*
High cIMT Left	54(32.73%)	19(45.24%)	0.129
Mean cIMT	50 (30.3%)	19 (45.2%)	0.067
Ùcæcï•cï&æ||ˆ •ï }ï,&æ}c æc 5% |^ç^|			
Abbreviations: cIMT- carotid intima media thickness, HbA1c- Hemoglobin A1c			

anthropometric parameters such as age, sex, BMI, WHR, WHtR (see **Table 2**).

Proportion of children with dyslipidemia, IFG insulin resistance and hyperinsulinemia, abnormal le cIMT and mean cIMT were more in MA group compared to normal UACR group (not statistically signi cant) (**Table 2**). Proportion of children with abnormal right

cIMT values, were signi cantly higher in the MA group.

Study patients with MA and no MA were also compared for mean values of cardiometabolic parameters. Mean values of BP, triglycerides and HDL showed no difference betlBh72. Mean value

Citation: Vijayakumar M, SasidharanPillai S, Balakrishnan A (2021) Prevalence of Microalbuminuria and its Association with Cardiometabolic Risk Factors in Children with Obesity and Overweight Attending Obesity Clinic, Kerala, India. J Obes Weight Loss Ther 11: 466.

Page 5 of 7

Þ[â}•˘|â} ¦^•â•cæ}&^	(}M15) 52.13 +/- 24.4Ì J	0.195	(}M3) 3Ì.67 +/- 7.506	0.566
Insulin resistance	(}M17) 43.65 +/- 14.Ì66		(n=7) **51.29 +/- 23.400**	
C Reactive Protein within normal range	(}M2Ì) 4J.14 +/- 20.JJ7	0.265	(}MÌ) 43.50 +/- 11.Ì32	0.895
High C Reactive Protein	(}M4) 37 +/- 5.354		(n=2) **63.50 +/- 45.962**	
Þ[¦{æ| &æ¦[cìâ â}cì{æ {^âìæ c@ì&\}^••	(}M14) 4Ì.14 +/- 23.670	0.954	(}M6) 4Ì.00 +/- 24.000	0.991
High carotid intima media thickness Right	(}M1Ì) 47.22 +/- 17.515		(}M4) 46.75 +/- 16.Ì20	
Þ[¦{æ| &æ¦[cìâ â}cì{æ {^âìæ c@ì&\}^•• Š^-c	(}M1Ì) 4Ì.06 +/- 21.577	0.761	(}M5) 51.40 +/- 25.165	0.235
High carotid intima media thickness Left	(}M14) 47.07 +/- 1Ì.776		(}M5) 43.60 +/- 16.1Ì0	
Þ[-æcc˘ |âç^¦	(}M13) 4Ì.77 +/- 25.J46	0.282	(}M5) 45.20 +/- 11.5Ì4	0.763
Fatty Liver	(}M1J) 46.Ì4 +/- 15.632		(}M5) 4J.Ì0 +/- 2Ì.030	
Þ[T^cæà[|ì& •ˆ}â¦[{^	(}M20) 4J.50 +/- 20.J15	0.3J5	(}MÌ) 4J.75 +/- 22.0J6	0.511
Metabolic syndrome	(}M12) 44.50 +/- 1J.0Ì6		(}M2) 3Ì.50 +/- 10.607	
Ùcæcì•cì&æ||ˆ •ì}â,&æ}c æc 5% |^ç^|				

levels and CRP were clearly not associated with the presence of MA. (**Table 3**).

Relationship between Mean UACR and various cardiometabolic risk factors were analyzed in children with overweight and obese group (**Table 4**) and no signi cant associations were observed.

Discussion

About 1/5th of the study population comprising of 207 children with ow- ob had microalbuminuria. Prevalence of MA was more in girls compared to boys though not statistically signi cant. Mean UACR was highest for overweight girls. Mean UACR was signi cantly higher in post pubertal girls in comparison to prepubertal and pubertal girls. No signi cant di erences were found in terms of demographic, anthropometric parameters and cardiometabolic risk factors between those with MA and those with normal UACR. Proportion of children with abnormal right cIMT values, were signi cantly higher in the MA group. Mean UACR was high in children with obesity having elevated systolic BP and in children with overweight having hypertriglyceridemia, dyslipidemia, prediabetes, hyperinsulinemia, insulin resistance or high CRP, compared to children with ow-ob having no cardiometabolic risk factors, though not signi cant.

One study from Bangladesh observed microalbuminuria in 14.3% of children with overweight and signi cant association of hypertension with high urinary microalbumin in these children [18]. Prevalence of

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endothelial dysfunction leading to widespread organ damage in obesity. Endothelial dysfunction of renal microvasculature leads to hyper ltration and proteinuria. Endothelial dysfunction is seen in early

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Page 7 of 7

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