

Dysbiosis in the Gut Microbiota of Adolescents with Obesity

Results

Microbial richness and biodiversity indices were similar in the groups with obesity and normal weight. No difference was found between two groups in the phyla Firmicutes, Bacteroidetes, Proteobacteria, Actinobacteria, and in the genera *Bacteroides*, *Alistipes*, *Subdoligranulum*, *Megasphaera*, *Blautia*, *Akkermansia*, *Odoribacter*, *Faecalibacterium*, *Lactobacillus*, *Bifidobacterium*, and *Streptococcus*. On the other hand the obese participants had a 2-fold decrease in *Enterobacter* (42 (13-61) in OB, 167 (42-371) in CO, $p=0.02$), and an increase – in the *Anaerotruncus* phylotypes (326 (215-732) in OB, 226 (165-320) in CO, $p=0.04$).

Indices / phylum / phylotype	OB group (n=18)	CO group (n=22)	p
OTU	465±56	486±61	0.27
Shannon	5.89±0.57	5.94±0.52	0.79
Simpson	0.95±0.04	0.95±0.04	0.80
Chao1	502.65±59.01	526.22±65.26	0.24
ACE	508.90±58.95	531.99±62.79	0.24
Bacteroidetes/ Firmicutes	0.93 (0.67-1.34)	1.18 (0.74-1.65)	0.47
Proteobacteria/Actino bacteria	4.05 (3.02-8.04)	4.01 (2.33-7.58)	0.56

Firmicutes	22407 (18131-27155)	21334 (17194-26040)	0.55
Bacteroidetes	21734 (18863-27120)	23723 (19813- 27388)	0.48
Proteobacteria	3337 (1433-5372)	2618 (1867-4329)	0.95
Actinobacteria	682 (311-932)	563 (403-935)	0.76
<i>Bacteroides</i>	8490.50 (6662-15519)	9993 (8106-14328)	0.88
<i>Alistipes</i>	2613 (1158- 4021)	2661 (1496- 4257)	0.59
<i>Subdoligranulum</i>	1441 (775-2257)	1775 (829-2389)	0.71
<i>Megasphaera</i>	84 (43-195)	144 (67-395)	0.30
<i>Blautia</i>	411 (103-1028)	364 (195-786)	0.95
<i>Akkermansia</i>	189 (66-521)	226 (57-445)	0.94
<i>Enterobacter</i>	42 (13-61)	167 (42-371)	0.02*
<i>Anaerotruncus</i>	326 (215-732)	226 (165-320)	0.04*
<i>Odoribacter</i>	66 (51-112)	75 (35-127)	0.91
<i>Faecalibacterium</i>	1218 (819-2241)	1119 (776-1778)	0.71
<i>Lactobacillus</i>	11 (7-23)	16 (6-62)	0.58
<i>Bifidobacterium</i>	226 (113-359)	300 (214-489)	0.15
<i>Streptococcus</i>	55 (16-117)	52 (19-109)	0.97

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Conclusion

There were no significant differences in microbial richness and the biodiversity in obese and normal weight adolescences. The main phyla Firmicutes, Bacteroidetes, Proteobacteria, and Actinobacteria of human microbiome were comparable at adolescents with obesity and normal weight.

At the lower taxonomic levels, our data shows that gut microbiota of adolescences with obesity have a prevalence of *Anaerotruncus* (the phylum Firmicutes) and decreased number of *Enterobacter* phylotypes (the phylum Proteobacteria).

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Declaration of interest

No conflicts of interest were disclosed.