

Tables

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Table S1. The percentage of weight loss (and BMI reduction) greater than 5% in the two groups

	Treatment	Placebo	P value
Percentage of participants that reached 5% body weight loss	72.22 % (13 out of 18)	36.84% (7 out of 19)	<0.001
Percentage of participants that reached 5% reduction in BMI	77.78% (14 out of 18)	36.84% (7 out of 19)	<0.001

Note: BMI, Body Mass Index

Table S2. Mean changes in Analysis of human fat composition in the two group before and after treatment.

Items	Treatment (n=18)		Placebo (n=19)	
	Baseline	Post-treatment	Baseline	Post-treatment
Body fat rate (%)	34.93 ± 8.55	31.44 ± 8.3 ^{***##}	39.63 ± 4.37	38.21 ± 4.57 ^{***}
Body moisture rate (%)	45.21 ± 3.79	44.27 ± 4.06	42.79 ± 3.97	42.43 ± 4.5
Rate of skeletal muscle (%)	25.04 ± 1.37	26.71 ± 1.66 ^{***}	25.31 ± 2.38	25.93 ± 2.20
Basal metabolic rate Kcal/day	1683.8 ± 271.7	1633.5 ± 299.3	1599.9 ± 251.7	1571.3 ± 258.2
Body Fat (kg)	34.47 ± 5.65	29.37 ± 5.76 ^{***##}	37.29 ± 8.58	35.59 ± 8.53 ^{***}
Fat-free body weight (kg)	56.12 ± 16.6	54.41 ± 16.53 ^{**}	56.72 ± 11.07	55.68 ± 11.28 ^{***}
Body fat muscle ratio	1.47 ± 0.21	1.29 ± 0.24 ^{***##}	1.58 ± 0.29	1.53 ± 0.29 ^{**}

Data are shown as mean ± SD. Intra-group analyses were performed by using t test followed by Wilcoxon (*p* value, ** < 0.01, *** < 0.001), inter-group analyses were performed by using 2-way ANOVA (## represents *p* < 0.01) by Prism 9 software

Body fat (kg) = Body Weight (kg) * Body fat rate (%).

Fat-free body weight (kg) = Body weight - Body fat.

Body fat muscle ratio = Body fat rate (%) / Rate of skeletal muscle (%).

Table S3. Mean changes in Routine Blood and biochemistry index.

Items	Normal values	Treatment (n=18)		Placebo (n=19)	
		Baseline	Post-treatment	Baseline	Post-treatment
WBC ($\times 10^9/L$)	3.5-9.5	6.79 ± 1.61	6.6 ± 1.18	7.6 ± 1.71	7.23 ± 1.39
NE ($\times 10^9/L$)	40-75	4.08 ± 1.16	3.96 ± 1.03	4.46 ± 1.06	4.35 ± 1.04
NE%	40.0--75.0	59.46 ± 6.64	57.65 ± 6.79	58.54 ± 4.26	56.71 ± 5.05
EO%	0.4--8.0	2.30 ± 1.37	2.17 ± 1.29	1.66 ± 1.13	1.72 ± 1.03
RBC ($\times 10^{12}/L$)	3.80--5.10	4.90 ± 0.37	4.94 ± 0.39	4.65 ± 0.41	4.77 ± 0.39
PLT ($\times 10^9/L$)	125--350	205.61 ± 33.57	208.56 ± 34.1	220.79 ± 36.01	211.79 ± 36.01
HB (g/L)	115--150	145.44 ± 10.05	142.83 ± 9.77	140.63 ± 12.89	136.95 ± 12.71
ALT (U/L)	0.0--40.0	30.44 ± 10.92	30.17 ± 8.77	32.16 ± 24	31.37 ± 28.51
AST (U/L)	0.0--45.0	21.67 ± 4.23	21.06 ± 3.69	20.63 ± 7.21	23.47 ± 10.96
GGT (U/L)	0.0--45.0	42.22 ± 23.57	38.65 ± 15.27	36.37 ± 24.48	39.26 ± 27.85
TBIL ($\mu\text{mol/L}$)	5.0--21.0	15.31 ± 4.72	14.36 ± 3.15	11.67 ± 3.56	13.03 ± 4.07
TP ($\mu\text{mol/L}$)	65.0--85.0	73.49 ± 4.54	73.44 ± 3.94	73.89 ± 4.14	75.45 ± 5.95
A (g/L)	40.0--55.0	41.68 ± 2.4	42.64 ± 2.39	40.95 ± 2.2	45.15 ± 5.59
BUN (mmol/L)	2.5-7.2	4.30 ± 1.21	4.27 ± 1.09	5.03 ± 1.34	4.88 ± 0.79
Cre ($\mu\text{mol/L}$)	45-84	61.67 ± 13.22	$55.83 \pm 9.25^*$	57.26 ± 12.86	57.21 ± 10.89

Data was shown as mean \pm SD. Intra-group analyses were performed by using t test followed by Wilcoxon by Prism 9 software, p value, * < 0.05 .

Table S4. Adverse reactions during WL-HIT treatment.

No.	Time of reaction	Adverse Reactions	Treating methods	Complete treatment or not	Group
1	Three days later	Decreased hyper appetite, bloating	After-meal administration	Yes	Treatment
	A week later.	Mild diarrhea	Light diet, avoid greasy diet, normal the next day		
2	A week later	Decreased hyper appetite	After-meal administration	Yes	
	Two weeks later	Eliminates constipation.	No treating		
1	A week later	Mild nausea, bloating, stomach upset, Decreased hyper appetite	After-meal administration;	Yes	Open trail
2	Two days later	Nausea, decreased hyper appetite	After-meal administration	Yes	
	Two weeks later	Increased frequency (3-4 times) of stools for a few days.	Dose reduction by 33%.		
3	Three days later	A dry and bitter feel in the mouth	No special treatment, normal after two days	Yes	
4	Four days later	Nausea, decreased hyper appetite	Disciplinarian bite and sup.	Yes	
5	A week later.	Decreased hyper appetite, tired of greasy	After-meal administration	Yes	

Table S5. A summary of the 16s sequencing data. Data are presented as the mean \pm SD.

Item	Treatment		Placebo	
	Baseline	Post-treatment	Baseline	Post-treatment
Reads	6001 \pm 1281	5627 \pm 1388	6071 \pm 1513	4907 \pm 1632
OTUs	79.11 \pm 31.87	80.27 \pm 29.11	94.81 \pm 32.50	75.11 \pm 23.60
Phylum	6.16 \pm 1.09	6.22 \pm 1.03	5.89 \pm 1.15	5.89 \pm 1.32
Order	14.88 \pm 3.25	15.28 \pm 3.08	15.47 \pm 1.98	15.11 \pm 1.97
Family	22.62 \pm 5.77	23.61 \pm 4.96	24.73 \pm 4.32	22.47 \pm 3.71
Genus	39.11 \pm 10.96	40.15 \pm 9.86	42.15 \pm 8.25	36.11 \pm 6.26
Species	58.01 \pm 19.28	59.50 \pm 16.85	66.52 \pm 18.76	55.68 \pm 13.15
Ace	93.51 \pm 36.76	93.91 \pm 36.51	115.41 \pm 31.07	93.09 \pm 33.3*
Chao 1	93.29 \pm 38.30	94.31 \pm 37.10	119.28 \pm 35.6	91.97 \pm 31.23*
Simpson	0.23 \pm 0.15	0.26 \pm 0.13	0.16 \pm 0.13	0.19 \pm 0.14
Shannon	2.42 \pm 0.69	2.37 \pm 0.65	2.74 \pm 0.66	2.53 \pm 0.55

Table S6. The phylotypes were significantly different between the treatment and placebo groups.

Phylotypes		T test (Metastats) TA vs CA		Treatment (Relative abundance)			Placebo (Relative abundance)		
		p value	Q value	WLTB	WLTA	Riched group	WLCB	WLCA	Riched group
Phylum	<i>Verrucomicrobiota</i>	0.004	0.043			WLTA			
Species	<i>Akkermansia_muciniphila</i>	0.003	0.013	4.48%	10.52%	WLTA	1.73%	0.08%	
Phylum	<i>Firmicutes</i>	-							
Class	<i>Clostridia</i>	<0.001	0.005	22.17%	19.65%		33.64%	37.76%	WLCA
Family	<i>Oscillospiraceae</i>	0.014	0.054	2.45%	1.83%		2.17%	0.85%	WLCA
Class	<i>Negativicutes</i>			2.94%	6.51%	-	5.72%	3.13%	-
Family	<i>Ruminococcaceae</i>	0.007	0.029	7.05%	8.53%		13.91%	17.23%	WLCA
Species	<i>Megamonas_funiformis</i>			0.03%	3.14%	-	0.31%	0.73%	-
Phylum	<i>Proteobacteria</i>	-							
Class	<i>Gammaproteobacteria</i>			32.31%	29.88%	-	29.83%	32.84%	-
Genus	<i>Klebsiella</i>	0.003	0.019						WLCA
Species	<i>Klebsiella_pneumoniae</i>			3.63%	1.19%		3.07%	5.42%	
Genus	<i>Haemophilus</i>	0.003	0.019						WLCA
Species	<i>Haemophilus_parainfluenzae</i>	<0.001	0.005	0.15%	0.00%		0.21%	1.85%	WLCA

Figures

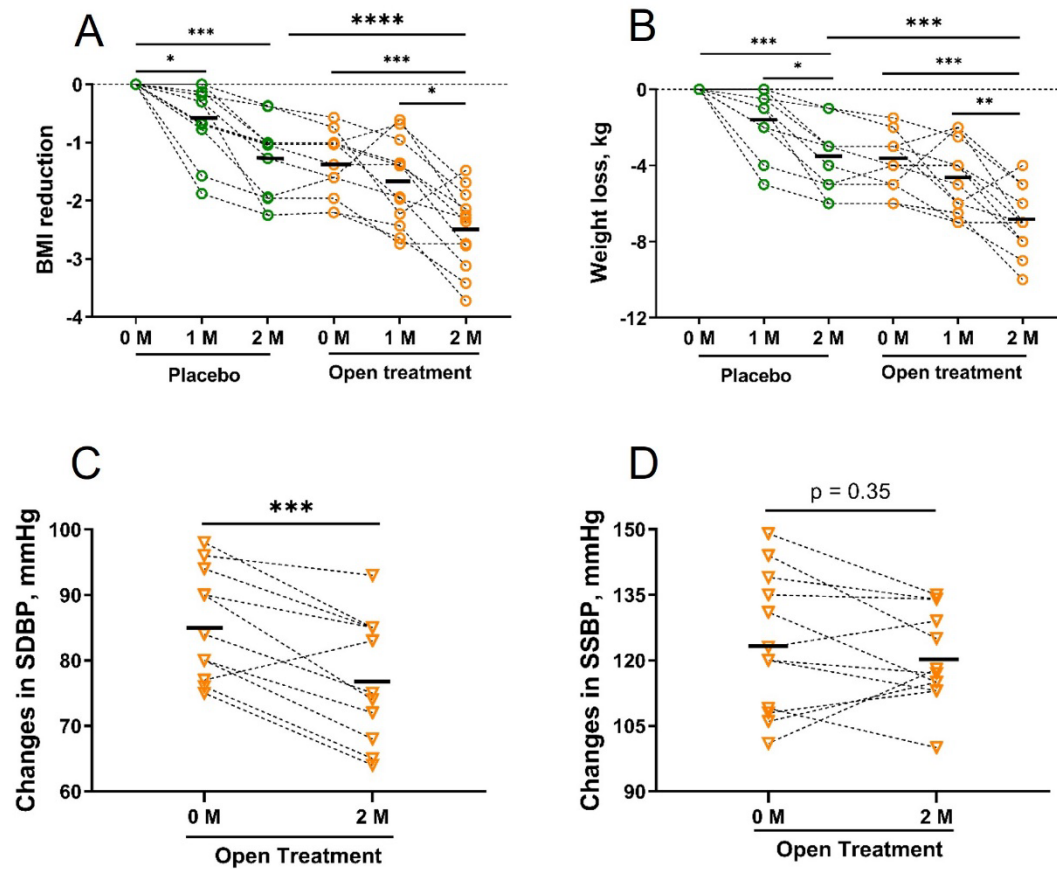


Fig. S1. The reduction in body weight (A) and BMI (B), and mean changes in SDBP(C), and SSBP(D) in secondary measurements. Bars were shown as mean of each group (n=12). All analyses were performed using one-way ANOVA followed by Bonferroni post hoc by Prism 9 software (*, **, *** and **** represent $p < 0.05$, $p < 0.01$, $p < 0.001$ and $p < 0.0001$).

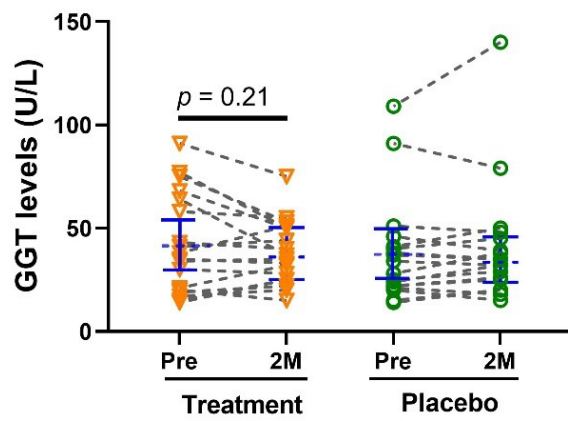


Fig. S2. **Mean Changes in the GGT levels.** Bars were shown as mean of each group with 95% CI. Intra-group analyses were performed using t test followed by Wilcoxon by Prism 9 software (** and *** represent $p < 0.01$ and $p < 0.001$).