

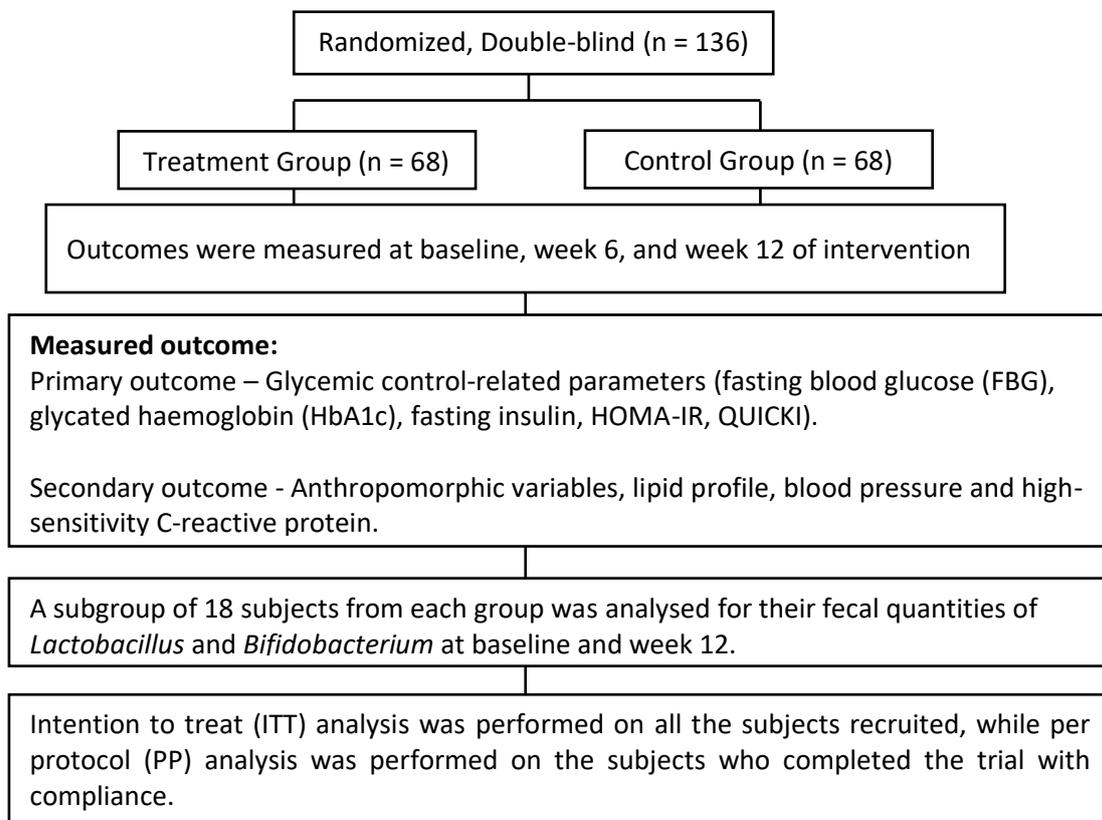
Effect of multi-strain probiotics (multi-strain microbial cell preparation) on glycemic control and other diabetes-related outcomes in people with type 2 diabetes: a randomized controlled trial.

Objectives

To investigate the effect of multi-strain probiotics supplementation on glycemic control and other diabetes-related outcomes in people with type 2 diabetes.

Methods

This was a randomized, double-blind, parallel-group, controlled clinical trial. A total of 136 participants with moderately well-controlled type 2 diabetes aged 30 – 70 years were randomized to receive either HEXBIO® or placebo for a period of 12 weeks.



Outcomes

This study showed a significant reduction in HbA1c and fasting insulin in the moderately well-controlled type 2 diabetes patients after administered with HEXBIO® for the period of 12 weeks ($p < 0.05$). In addition, normal weight category patients from the Treatment group have significantly decreased HbA1c and Triglyceride levels after 12 weeks ($p < 0.05$). The increased quantities of *Lactobacillus* spp. and *Bifidobacterium* spp. in fecal load for the treatment group indicates the successful passage and transit of bacteria in HEXBIO.

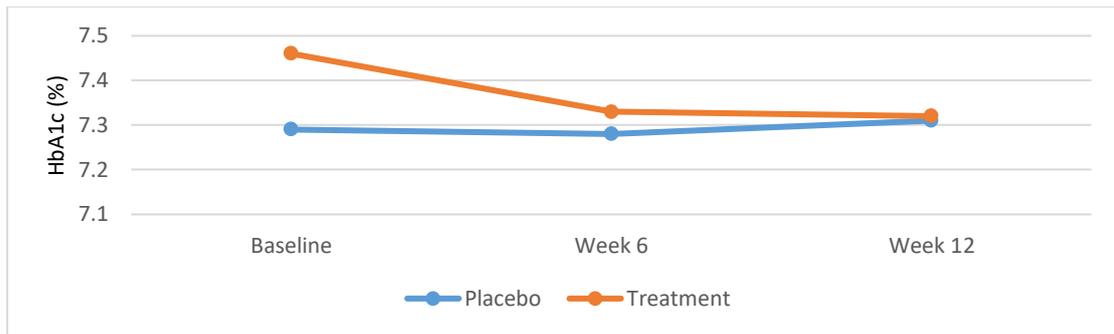


Figure 1. Changes of Glycated Haemoglobin, HbA1c (%) between Treatment group and Placebo group over the period of 12 weeks. Significant reduction of Glycated Haemoglobin, HbA1c (%) in PP analysis ($p < 0.05$).

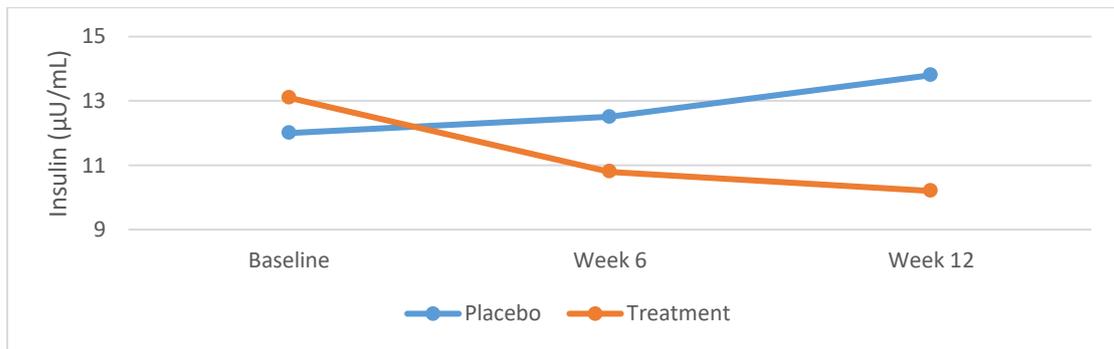


Figure 2. Changes in Insulin Level ($\mu\text{U}/\text{mL}$) between Treatment group and Placebo group over the period of 12 weeks. Significant reduction of insulin level ($\mu\text{U}/\text{mL}$) in ITT analysis and PP analysis ($p < 0.05$).

Table 1. Fecal Quantities of *Lactobacillus* spp. and *Bifidobacterium* spp. in Placebo group and Treatment Group over the period of 12 weeks.

	Timeline		p-value
	Baseline	Week 12	
<i>Lactobacillus</i> spp. (CFU/g)			
Placebo	$1.8 \times 10^7 \pm 0.7 \times 10^7$	$2.1 \times 10^7 \pm 9.2 \times 10^6$	0.647
Treatment	$6.4 \times 10^6 \pm 1.1 \times 10^6$	$1.2 \times 10^7 \pm 6.4 \times 10^6$	<0.05
<i>Bifidobacterium</i> spp. (CFU/g)			
Placebo	$2.7 \times 10^6 \pm 0.8 \times 10^6$	$5.3 \times 10^6 \pm 1.9 \times 10^6$	0.749
Treatment	$3.4 \times 10^6 \pm 0.2 \times 10^6$	$1.4 \times 10^7 \pm 1.5 \times 10^7$	<0.05

Conclusion

Consumption of HEXBIO® showed improvements in HbA1c and fasting insulin in the moderately well-controlled type 2 diabetes patients during the period of 12 weeks.

Reference

Firouzi, S., Majid, H. A., Ismail, A., Kamaruddin, N. A., & Barakatun Nisak, M. Y. (2017). Effect of multi-strain probiotics (multi-strain microbial cell preparation) on glycemic control and other diabetes-related outcomes in people with type 2 diabetes: a randomized controlled trial. *European Journal of Nutrition*, 56(4), 1535–1550. <https://doi.org/10.1007/s00394-016-1199-8>