

Received date: 07-11-2022 | Accepted date: 10.11.2022 | Published date: 03.01.2023

The relation between gut microbial profile and osteoporosis status in postmenopausal women

Bolaji Lilian Ilesanmi-Oyelere¹, Elizabeth Rettedal², Jane Coad¹, Roy³ and Kruger¹

¹Massey University, New Zealand

²AgResearch, New Zealand

³Otago University, New Zealand

The gut microbiota has been postulated to affect nutrient absorption, the endocrine and immune systems and bone metabolism. The gut microbiota, otherwise known as the largest gene pool of the human body may play a significant role in bone health. Eighty-six postmenopausal women were recruited from the Manawatu-Whanganui region, for a cross-sectional study and participated in the phase II trial which involved faecal sample collection. The women were classified into two groups of healthy (H) and osteopenic/osteoporotic (OP) based on the WHO classification of their BMD and resultant T-scores. Faecal DNA samples collected from eligible post-menopausal women underwent whole genomic sequencing by Illumina HiSeq® 2500 System. The microbial composition diversity (alpha diversity based on Shannon index) was significantly decreased among the OP group compared to the healthy group when using the hip classification (PShannon = 0.013) as well as femoral neck (PShannon = 0.0003) status but not for the spine (PShannon = 0.40) classification. The composition (beta diversity) did not differ significantly between the groups based on the hip T-score (PANOSIM = 0.373, PADONIS = 0.075, Pbetadisper = 0.066) but was significant based on the femoral neck (PANOSIM = 0.024, PADONIS = 0.703, Pbetadisper = 0.010) and spine (PANOSIM = 0.024, PADONIS = 0.703, Pbetadisper = 0.010) T-score status. The phylum Bacteroidetes were more abundant for the OP group, while Firmicutes were more abundant for the healthy group. At genus level, *Bacteroides*, *Parabacteroides* and *Enterococcus* were identified as possible biomarkers for development of osteoporosis. *Acidimicrobium*, *Aquifex* and *Tetrahymena* had the most influence in the classification based on the hip and *Magnetococcus*, *Akkermensia* and

Moritella had the most influence based on the spine osteoporosis status. The results presented here provide a possible link between certain members of the gut microbiota and bone loss/osteoporosis.

Recent Publications

1. Ilesanmi-Oyelere BL and Kruger Marlina (2022). B-vitamins and homocysteine as determinants of bone health: a literature review of human studies, *Journal of Human Nutrition and Dietetics*, J Hum Nutr Diet.doi: 10.1111/jhn.13080.
2. Salavatizadeh M, Soltanieh S, Chegini M, Ilesanmi-Oyelere BL, Kord-Varkaneh H, Hekmatdoost A. (2022) Micronutrient intake and risk of ulcerative colitis: A meta- analysis of observational studies, *Clinical Nutrition ESPEN*, <https://doi.org/10.1016/j.clnesp.2022.07.008>.
3. Abu-Zaid A, Gaman MA, Jamilian P, Ilesanmi-Oyelere BL, Jamilian P, Baradwan S, Bajaman JS, Alras KA, Kutbi E, Al-Ghrai AKM, Sadulah DDS, Albazee E, Alomar O, Al- Badawi IA, Salem H. (2022) The effect of 17 β -estradiol plus norethisterone acetate treatment on the lipid profile in women: a dose-response meta-analysis of randomized controlled trials. *Exp Gerontol*. 2022 May 28;165:111855. doi: 10.1016/j.exger.2022.111855. Epub ahead of print. PMID: 35640782.

Biography

Bolaji Lilian Ilesanmi-Oyelere is a postdoctoral (Nutritional Science) fellow with an expertise in the area of human nutrition, health and aging healthcare. Her research has focussed on nutrition, inflammation, gut microbiome and bone health in postmenopausal women. She is based in the School of Health Sciences, Massey University, Palmerston North, New Zealand.

e: b.ilesanmi-oyelere@massey.ac.nz