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*Mc Gettigan N, O'Toole A, Boland K*

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## “Role of exercise in preventing and restoring gut dysbiosis in patients with inflammatory bowel disease”: A letter to the editor

Neasa Mc Gettigan, Aoibhlinn O'Toole, Karen Boland

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### Abstract

Exercise-induced changes of the microbiome in inflammatory bowel diseases (IBD) is a promising field of research with the potential for personalized exercise regimes as a promising therapeutic adjunct for restoring gut dysbiosis and additionally for regulating immunometabolic pathways in the management of IBD patients. Structured exercise programmes in IBD patients of at least of 12 wk duration are more likely to result in disease-altering changes in the gut microbiome and to harness potential anti-inflammatory effects through these changes along with immunometabolic pathways.

**Key Words:** Inflammatory bowel diseases; Microbiota; Dysbiosis; Metabolism; Exercise; Cytokines

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**Core Tip:** Exercise-induced changes of the microbiome in inflammatory bowel diseases (IBD) is a promising field of research with the potential for personalized exercise regimes as a promising therapeutic adjunct for restoring gut dysbiosis and additionally for regulating immunometabolic pathways in the management of IBD patients. We have observed that exercise programmes of at least 12 wk duration are required to exert any meaningful effects on gut dysbiosis restoration and suggest that the positive effects of a more prolonged programme may extend to inflammatory mediation through regulation of immunometabolism.



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## TO THE EDITOR

We read with interest a review article by Koutouratsas *et al*[1] on the "Role of exercise in preventing and restoring gut dysbiosis in patients with inflammatory bowel diseases: A review".

We agree with the authors conclusion that the effects of prescribed exercise on the microbiome is a promising area for further research and that the potential for personalized exercise regimes is a promising therapeutic adjunct when considering the restoration of gut dysbiosis in the management of inflammatory bowel diseases (IBD) patients.

With personalization of exercise regimes in mind, we find it is pertinent to consider the duration of any given exercise programme prescribed for IBD patients. This review article presents the findings of a number of clinical trials in humans examining the effect of various forms of exercise on gut microbiome composition, functionality and diversity. Interestingly, we would like to remark on the duration of exercise programmes and to highlight that the studies of short-term exercise programmes (6 wk duration or less) did not show any clinically significant effect on gut microbiome diversity or composition[2,3] in comparison to studies of at least 12-wk duration which showed changes in gut microbiome composition, diversity and functionality[4,5]. A study of IBD patients not included in the review of 8 wk duration of a prescribed aerobic exercise programme also did not show any significant difference in gut microbiome composition/diversity in response to the exercise programme but other benefits were demonstrated including an improvement in muscle mass and body fat % [6]. Furthermore, two studies of elite athletes, one of rugby players and the other of rowers showed significant differences in microbiome with exercise which likely reflects the habitual nature of the exercise in addition to other factors such as diet[7,8].

A range of exercises have been shown to be safe in patients with IBD including moderate intensity aerobic exercise, resistance training and high intensity interval training[6,9,10]. We suggest that any future studies examining the effects of exercise on changes in the gut microbiome should be of at least 12 wk duration with consideration given to the recommended physical activity guidelines to avoid potential harmful effects of excessive vigorous exercise whilst also being mindful of disease activity (*i.e.*, a personalized approach would be the optimum)[11-13].

Exercise has been shown as a promising therapeutic intervention or adjunct to influence metabolism in disorders including multiple sclerosis through regulation of immune cells[14]. This is mediated through cytokine secretion, and modulation of metabolic regulators including tryptophan[15,16]. Therefore, we suggest that future studies on the effects of structured exercise programmes in IBD patients should be at least of 12 wk duration to promote disease-altering changes in the gut microbiome and harness potential anti-inflammatory effects through these changes along with immunometabolic pathways. These benefits would be in addition to promoting sustained exercise behavioral patterns.

## FOOTNOTES

**Author contributions:** Mc Gettigan N wrote the letter, O'Toole A and Boland K revised the letter.

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