INPLASY

Use of carbohydrate (CHO), gluten, and FODMAP-free diets, to prevent gastrointestinal symptoms in endurance athletes. A systematic review

INPLASY202490080
doi: 10.37766/inplasy2024.9.0080
Received: 18 September 2024
Published: 18 September 2024

Montero-Carrasco, K; Arias-Tellez, M; Soto-Sánchez, J.

Corresponding author:
Johana Soto-Sánchez

johana.soto@umayor.cl

Author Affiliation:
Universidad Mayor.

ADMINISTRATIVE INFORMATION

Support - Without support.

Review Stage at time of this submission - Completed but not published.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY202490080

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 18 September 2024 and was last updated on 18 September 2024.

INTRODUCTION

Review question / Objective Are CHO, gluten-free, and low-FODMAP diets effective in mitigating GIS in EA? Consequently, this review aims to analyze the efficacy of CHO, gluten-free, and low-FODMAP diets in preventing GIS in adult EA of both sexes.

Rationale Endurance athletes (EA) often experience gastrointestinal symptoms (GIS) [1,2] that affect their performance and health [3,4]. Previous findings suggest that up to 70% of EA, during rest and moderate and vigorous exercise, can have a high frequency and intensity of symptoms [5,6]. These multifactorial symptoms involve mechanical, physi-ological, and nutritional factors [2,7]. They may occur before, during, or after and manifest as upper symptoms (including nausea, vomiting, and reflux) or lower symptoms (in-cluding abdominal pain, bloating, flatulence, diarrhea, and rectalbleeding)[8].

The relationship between nutritional interventions and the maintenance or alteration of intestinal integrity is still unclear. Even though the intake of CHO could benefit the performance of athletes, their impact on GIS symptoms is yet unknown, making it difficult to develop recommendations [9]. In addition, gluten-free and low-FODMAP diets are popularly suggested to improve gastrointestinal health [10]. Based on previous reviews, it is evident that a substantial number of athletes are not diagnosed with a clinical condition necessitating a gluten-free diet to prevent gastrointestinal issues[10]. Additionally, athletes who adhere to a gluten-free diet inadvertently reduce their intake of high-FODMAP foods, effectively reducing gastrointestinal symptoms [11]. This approach depends on the athletes' characteristics and the severity of gastrointestinal issues [12].

Condition being studied Endurance athletes (EA) with gastrointestinal symptoms (GIS) that affect their performance and health.

METHODS

Search strategy ((("Diet, Carbohydrate-Restricted"))) OR ("Diet, Gluten-Free"AND ("Gastrointestinal Diseases")) AND ("Athletes").

Participant or population Adult endurance athletes or runners with GIS of both sexes.

Intervention Use of CHO, gluten-free, and low-FODMAP diets in preventing GIS or applied of diet questionary.

Comparator None/placebo.

Study designs to be included Original studies from the last eight years (cross-sectional studies, randomized controlled trials, crossover trials, case studies), written in English or Spanish, be available to the authors as a full text that includes results about the relationship between use or intake of CHO, low-gluten, and low-FODMAP diets with GIS in EA or runners.

Eligibility criteria We using PICOS model.

Information sources In PubMed, the MeSH (Medical Subject Heading) terms were used. The same search strategy and combination of terms was repeated in EBSCO, Google Scholar, and Web of Science. We don't uses grey literature, trial register and we don't contact any authors.

Main outcome(s) GI reports (self-reported gut symptoms).

Data management A researcher reviewed in detail whether the articles met the inclusion criteria established in two phases: a) reading the title and abstract and b) and finally, reading the full text of the articles included in the previous phase.

Quality assessment / Risk of bias analysis The risk of bias and quality in each paper was assessed by the authors using the checklist PEDro Scale (Physiotherapy Evidence Database).

Strategy of data synthesis After the inclusion criteria and PEDro scale checklist were applied, information on the author and year of publication, objective, type of diet, methodology, results, and conclusion were extracted by two authors independently.

Subgroup analysis CHO diet; reducing a low-FODMAP diet; gluten free diet.

Sensitivity analysis Calculated as the number of relevant items identified divided by the total number of relevant items from all searches.

Language restriction English.

Country(ies) involved Chile.

Keywords sports nutrition; sports performance; gastrointestinal upset; athletes' preferences.

Dissemination plans scientific journal and conferences in congresses.

Contributions of each author

Author 1 - Karen Montero-Carrasco
-Concept Development: This author propose the idea of this topic.
- Research and Analysis: Conducted exhaustive research on database.
- Writing and Editing: This author wrote the first draw of the review, and editing to long the process.
Email: kmontero.profe@gmail.com
Author 2 - Maria Jose Arias-Tellez.
-Literature Review: Undertook a comprehensive literature review to contextualize the research with her expertise in sport nutrition area.
-Data Collection: Supervised the data collection process and check the results of the articles selection
-Writing and Editing: Played a significant role in drafting and revising the manuscript to enhance clarity.
Email: mariajosearias@uchile.cl
Author 3 - Johana Soto-Sánchez.
-Methodology Design: Developed the research methodology and analysis the consistence the manuscript.
-Project Management: Coordinated the systematic review timelines and facilitated communication among team members
- Data Collection: Supervised the data collection process
-Writing and Editing: This author wrote the first draw of the review, and edite during the process
Email: johana.soto@umayor.cl

References 1. Ryan, T.; Daly, E.; Ryan, L. Exploring the Nutrition Strategies Employed by Ultra-Endurance Athletes to Alleviate Exercise-Induced Gastrointestinal Symptoms-A Systematic Review. Nutrients 2023, 15, doi:10.3390/nu15204330.
2. de Oliveira, E.P.; Burini, R.C.; Jeukendrup, A. Gastrointestinal complaints during exercise: prevalence, etiology, and nutritional recommendations. Sports Med 2014, 44 Suppl 1, S79-85, doi:10.1007/s40279-014-0153-2.

3. Costa, R.J.S.; Snipe, R.M.J.; Kitic, C.M.; Gibson, P.R. Systematic review: exercise-induced gastrointestinal syndrome-implications for health and intestinal disease. Alimentary pharmacology & therapeutics 2017, 46, 246-265, doi:10.1111/apt.14157.
4. Bi, L.; Triadafilopoulos, G. Exercise and gastrointestinal function and disease: an evidence-based review of risks and benefits. Clinical gastroenterology and hepatology : the official clinical practice journal of the American Gastroenterological Association 2003, 1, 345-355, doi:10.1053/s1542-3565(03)00178-2.
5. Lira, C.A.B.; Viana, R.B.; Mesquista, K.P.; Santos, D.A.T.; Campos, M.H.; Andrade, M.S.; Vancini, R.L. Frequency and intensity of gastrointestinal symptoms in exercisers individuals at rest and during physical exercise: an internet-based survey. Intestinal research 2019, 17, 537-545, doi:10.5217/ir.2018.00162.
6. de Oliveira, E.P.; Burini, R.C. The impact of physical exercise on the gastrointestinal tract. Current opinion in clinical nutrition and metabolic care 2009, 12, 533-538, doi:10.1097/MCO.0b013e32832e6776.
7. Pugh, J.N.; Fearn, R.; Morton, J.P.; Close, G.L. Gastrointestinal symptoms in elite athletes: time to recognise the problem? British journal of sports medicine 2018, 52, 487-488, doi:10.1136/bjsports-2017-098376.
8. Papantoniou, K.; Michailides, C.; Bali, M.; Papantoniou, P.; Thomopoulos, K. Gastrointestinal bleeding in athletes. Annals of gastroenterology 2023, 36, 267-274, doi:10.20524/aog.2023.0788.
9. Arribalzaga, S.; Viribay, A.; Calleja-González, J.; Fernández-Lázaro, D.; Castañeda-Babarro, A.; Mielgo-Ayuso, J. Relationship of Carbohydrate Intake during a Single-Stage One-Day Ultra-Trail Race with Fatigue Outcomes and Gastrointestinal Problems: A Systematic Review. International journal of environmental research and public health 2021, 18, doi:10.3390/ijerph18115737.
10. Ajamian, M.; Rosella, G.; Newnham, E.D.; Biesiekierski, J.R.; Muir, J.G.; Gibson, P.R. Effect of Gluten Ingestion and FODMAP Restriction on Intestinal Epithelial Integrity in Patients with Irritable Bowel Syndrome and Self-Reported Non-Coeliac Gluten Sensitivity. Molecular nutrition & food research 2021, 65, e1901275, doi:10.1002/mnfr.201901275.
11. Lis, D.M.; Fell, J.W.; Ahuja, K.D.; Kitic, C.M.; Stellingwerff, T. Commercial Hype Versus Reality: Our Current Scientific Understanding of Gluten and Athletic Performance. Curr Sports Med Rep 2016, 15, 262-268, doi:10.1249/jsr.0000000000000282.
12. Lis, D.M. Exit Gluten-Free and Enter Low FODMAPs: A Novel Dietary Strategy to Reduce Gastrointestinal Symptoms in Athletes. Sports Med 2019, 49, 87-97, doi:10.1007/s40279-018-01034-0.