

World Journal of *Gastrointestinal Pharmacology and Therapeutics*

World J Gastrointest Pharmacol Ther 2022 May 5; 13(3): 30-32





LETTER TO THE EDITOR

- 30 Fuzhuan brick tea affects obesity process by modulating gut microbiota

Li ZP, Xu DH, He LP, Wang XJ

ABOUT COVER

Editorial Board Member of *World Journal of Gastrointestinal Pharmacology and Therapeutics*, Chao Sun, MD, PhD, Associate Chief Physician, Associate Professor, Department of Gastroenterology and Hepatology, Tianjin Medical University General Hospital, Tianjin 300052, China. chaosun@tmu.edu.cn

AIMS AND SCOPE

The primary aim of the *World Journal of Gastrointestinal Pharmacology and Therapeutics* (WJGPT, *World J Gastrointest Pharmacol Ther*) is to provide scholars and readers from various fields of gastrointestinal pharmacology and therapeutics with a platform to publish high-quality basic and clinical research articles and communicate their research findings online.

WJGPT mainly publishes articles reporting research results obtained in the field of gastrointestinal pharmacology and therapeutics and covering a wide range of topics including acid-related disorders, functional gastrointestinal disorders, fundamentals of gastrointestinal pharmacology, etc.

INDEXING/ABSTRACTING

The WJGPT is now abstracted and indexed in PubMed, PubMed Central, Reference Citation Analysis, China National Knowledge Infrastructure, China Science and Technology Journal Database, and Superstar Journals Database.

RESPONSIBLE EDITORS FOR THIS ISSUE

Production Editor: Hua-Ge Yu; Production Department Director: Xiang Li; Editorial Office Director: Jin-Li Wang.

NAME OF JOURNAL

World Journal of Gastrointestinal Pharmacology and Therapeutics

ISSN

ISSN 2150-5349 (online)

LAUNCH DATE

May 6, 2010

FREQUENCY

Bimonthly

EDITORS-IN-CHIEF

Emanuele Sinagra

EDITORIAL BOARD MEMBERS

<https://www.wjgnet.com/2150-5349/editorialboard.htm>

PUBLICATION DATE

May 5, 2022

COPYRIGHT

© 2022 Baishideng Publishing Group Inc

INSTRUCTIONS TO AUTHORS

<https://www.wjgnet.com/bpg/gerinfo/204>

GUIDELINES FOR ETHICS DOCUMENTS

<https://www.wjgnet.com/bpg/gerinfo/287>

GUIDELINES FOR NON-NATIVE SPEAKERS OF ENGLISH

<https://www.wjgnet.com/bpg/gerinfo/240>

PUBLICATION ETHICS

<https://www.wjgnet.com/bpg/gerinfo/288>

PUBLICATION MISCONDUCT

<https://www.wjgnet.com/bpg/gerinfo/208>

ARTICLE PROCESSING CHARGE

<https://www.wjgnet.com/bpg/gerinfo/242>

STEPS FOR SUBMITTING MANUSCRIPTS

<https://www.wjgnet.com/bpg/gerinfo/239>

ONLINE SUBMISSION

<https://www.f6publishing.com>



Fuzhuan brick tea affects obesity process by modulating gut microbiota

Zhi-Peng Li, Dong-Hui Xu, Lian-Ping He, Xin-Juan Wang

Specialty type: Food science and technology

Provenance and peer review: Invited article; Externally peer reviewed.

Peer-review model: Single blind

Peer-review report's scientific quality classification

Grade A (Excellent): 0
Grade B (Very good): B, B
Grade C (Good): 0
Grade D (Fair): 0
Grade E (Poor): 0

P-Reviewer: Herold Z, Hungary;
Xu PF, United States

Received: March 1, 2022

Peer-review started: March 1, 2022

First decision: April 12, 2022

Revised: April 12, 2022

Accepted: April 24, 2022

Article in press: April 24, 2022

Published online: May 5, 2022



Zhi-Peng Li, Dong-Hui Xu, Lian-Ping He, Xin-Juan Wang, School of Medicine, Taizhou University, Taizhou 318000, Zhejiang Province, China

Corresponding author: Xin-Juan Wang, MD, Senior Researcher, Teacher, School of Medicine, Taizhou University, No. 1139 Shifu Avenue, Taizhou 318000, Zhejiang Province, China.
wxjyxy@tzc.edu.cn

Abstract

The effect of Fuzhuan brick tea (FBT) on metabolism in obese mice is mediated by regulation of N-methyltransferase by aryl hydrocarbon receptor. The expression of the phosphatidylethanolamine N-methyltransferase gene is regulated by many transcription factors, and those specific to this effect need further investigation. Experimental animal studies have been designed to observe the effects of a single drug or the sequential effects of drugs. A washout period should be included if different drugs (e.g., antibiotics and FBT) are given to avoid or reduce additive effects or synergy. Currently, most experimental studies performed in mice used only male animals. However, experience has revealed that the results of using only male mice are very likely to have sex differences.

Key Words: Intestinal flora; Mice; Tea; Sex bias; Fuzhuan brick tea

©The Author(s) 2022. Published by Baishideng Publishing Group Inc. All rights reserved.

Core Tip: Some studies found that Fuzhuan brick tea has an effect on the gut microbiome. Many transcription factors regulate the expression of the phosphatidylethanolamine N-methyltransferase gene. Only selecting aromatic hydrocarbon acceptors for research needs to be given a sufficient basis. In germ-free mice, sex differences in metabolism were reduced, i.e., antibiotics may cause changes in the homogeneity of the mice, and if the mice are of different sexes, the gut microbiota of the mice may be different. Under the influence of antibiotics, sex differences in the microbiota may be reduced or even flattened.

Citation: Li ZP, Xu DH, He LP, Wang XJ. Fuzhuan brick tea affects obesity process by modulating gut microbiota. *World J Gastrointest Pharmacol Ther* 2022; 13(3): 30-32
URL: <https://www.wjgnet.com/2150-5349/full/v13/i3/30.htm>
DOI: <https://dx.doi.org/10.4292/wjgpt.v13.i3.30>

TO THE EDITOR

We were pleased to read the research article by Liu *et al*[1]. They conducted a study of the effects of Fuzhuan brick tea (FBT) on metabolism in a mouse model of obesity induced with a high-fat diet. They found that FBT had an impact on intestinal microbes. Most importantly, they pointed out that the beneficial effects of FBT on metabolism were strongly correlated with the intestinal flora of the mice. This article provides very detailed research and data analysis, study background, and very clear figures, and the results are reasonable. However, we believe that the study has issues worthy of further discussion.

The authors mentioned that abnormal levels of serum phosphatidylcholines (PCs) and/or a decreased PC to phosphatidylethanolamine (PE) ratio (PC/PE) are risk factors for obesity. Phosphatidylethanolamine N-methyltransferase (PEMT) catalyzes poor synthesis of PC or restricted conversion of PE to PC, which may be one of the factors responsible for abnormal metabolism of PC and PE. Many transcription factors are known to regulate the expression of the *PEMT* gene[2]. What was the basis for choosing only aryl hydrocarbon receptors? We recommend that the authors perform RNA sequencing to analyze the specific transcription factors regulated by PEMT. In addition, we also recommend that the authors provide the corresponding experimental steps so that subsequent works can replicate this experiment. Additionally, both Bernhard[3] and Tseng and Wu[4] reported that the effects of the human gut microbiome on host metabolism and inflammation greatly contribute to an increased risk of obesity. Therefore, high expression of inflammatory factors and abnormal metabolism constitute a high risk of obesity. We suggest that the authors explore the relationship between inflammatory factors and PEMT to strengthen their results and improve the study credibility.

All 35 mice used in the study were male, which ignored the impact of sex differences on the intestinal flora. Although male mice are more widely used in scientific research, this phenomenon generally only appears in the field of brain research. Investigators have increasingly found that the view that women are more "emotional and unstable", introduced in the 19th century, and having a strong influence on research design, falls short. The American neurologists Shansky and Murphy[5] explained that "do not use female animals for the primary reason for the research is that the influence of female hormones complicates many factors, especially when studying the brains of female animals." Problems caused by sex differences in response to drug treatment and difference in the misdiagnosis rate are recognized in fields other than neurology[6,7]. Some drugs are more effective in men than in women, such as the common anti-inflammatory drugs paracetamol and naproxen; others, such as alosetron, which treats acute diarrhea, is not effective for most men. In addition, Weger *et al*[8] described sex-specific differences in gene expression and metabolism that require the presence of microbiota. In germ-free mice, sex differences in metabolism were reduced. Male mice metabolized more like female mice, and female mice metabolized more like males. Antibiotics may cause changes that also introduce homogeneity in mice, and the intestinal flora of mice may be different if the sex of the mouse is different [9]. Under the influence of antibiotics, sex differences in microbiota are likely to be reduced or even flattened. Therefore, we suggest that the authors supplement their results with data obtained from a repeat study including a group of female mice.

In the experimental design, mice treated with antibiotics did not undergo a short washout period of 1-3 d, to eliminate the possible overlapping effects of antibiotics and FBT. Yi *et al*[10] found that polyphenols, the main active ingredient in tea, inhibited or killed intestinal bacteria, especially *Streptococci*. Koo and Cho[11] reported that tea reduced the absorption of cholesterol and lipids from the gastrointestinal tract, which synergistically interacted to improve disease state. Kiss *et al*[12] reported that the ingredients in tea affected the absorption of amoxicillin, thereby reducing its effectiveness. We thus suggest that the authors consider adding a transition period in the experimental design to avoid overlapping or interference between the effects of antibiotics and FBT.

We believe that analysis of the FBT components extracted in only one solvent was not comprehensive enough and may be a limitation, as the composition of FBT is complex, including both fat-soluble and water-soluble components. There may also be some kind of cross-linking between the components. We believe that these factors should all be taken into account.

FOOTNOTES

Author contributions: Li ZP and Xu DH performed the conceptualization, formal analysis, and writing of the original

draft; He LP and Wang XJ contributed to the writing, reviewing, and editing of the manuscript; all authors participated in drafting the manuscript and all have read, contributed to, and approved the final version of the manuscript.

Supported by General Research Project of Education Department of Zhejiang Province, No. Y202146955; 2019 Taizhou Science and Technology Bureau Project, No. 1902ky83; and The Second Batch of Research Projects on Teaching Reform in the 13th Five-Year Plan of Zhejiang Province, No. Jg20190460.

Conflict-of-interest statement: All authors of this article have read and agree Chemistry's fine print on the Copyright Transfer Agreement. The authors declare that there is no conflict of interest with any organization, institution, or individual.

Open-Access: This article is an open-access article that was selected by an in-house editor and fully peer-reviewed by external reviewers. It is distributed in accordance with the Creative Commons Attribution NonCommercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: <https://creativecommons.org/licenses/by-nc/4.0/>

Country/Territory of origin: China

ORCID number: Zhi-Peng Li 0000-0002-0355-7889; Dong-Hui Xu 0000-0002-4365-9257; Lian-Ping He 0000-0002-9627-5599; Xin-Juan Wang 0000-0002-3888-2016.

S-Editor: Fan JR

L-Editor: Wang TQ

P-Editor: Fan JR

REFERENCES

- Liu D, Wang J, Zeng H, Zhou F, Wen B, Zhang X, Luo Y, Wu W, Huang J, Liu Z. The metabolic regulation of Fuzhuan brick tea in high-fat diet-induced obese mice and the potential contribution of gut microbiota. *Food Funct* 2022; **13**: 356-374 [PMID: 34904994 DOI: 10.1039/d1fo02181h]
- Presa N, Dominguez-Herrera A, van der Veen JN, Vance DE, Gómez-Muñoz A. Implication of phosphatidylethanolamine N-methyltransferase in adipocyte differentiation. *Biochim Biophys Acta Mol Basis Dis* 2020; **1866**: 165853 [PMID: 32502648 DOI: 10.1016/j.bbdis.2020.165853]
- Bernhard W. Choline in cystic fibrosis: relations to pancreas insufficiency, enterohepatic cycle, PEMT and intestinal microbiota. *Eur J Nutr* 2021; **60**: 1737-1759 [PMID: 32797252 DOI: 10.1007/s00394-020-02358-2]
- Tseng CH, Wu CY. The gut microbiome in obesity. *J Formos Med Assoc* 2019; **118** Suppl 1: S3-S9 [PMID: 30057153 DOI: 10.1016/j.jfma.2018.07.009]
- Shansky RM, Murphy AZ. Considering sex as a biological variable will require a global shift in science culture. *Nat Neurosci* 2021; **24**: 457-464 [PMID: 33649507 DOI: 10.1038/s41593-021-00806-8]
- Spoletini I, Vitale C, Malorni W, Rosano GM. Sex differences in drug effects: interaction with sex hormones in adult life. *Handb Exp Pharmacol* 2012; **91**: 91-105 [PMID: 23027447 DOI: 10.1007/978-3-642-30726-3_5]
- Demyanets S, Wojta J. Sex differences in effects and use of anti-inflammatory drugs. *Handb Exp Pharmacol* 2012; **443**: 472 [PMID: 23027462 DOI: 10.1007/978-3-642-30726-3_20]
- Weger BD, Gobet C, Yeung J, Martin E, Jimenez S, Betrisey B, Foata F, Berger B, Balvay A, Foussier A, Charpagne A, Boizet-Bonhoure B, Chou CJ, Naef F, Gachon F. The Mouse Microbiome Is Required for Sex-Specific Diurnal Rhythms of Gene Expression and Metabolism. *Cell Metab* 2019; **29**: 362-382.e8 [PMID: 30344015 DOI: 10.1016/j.cmet.2018.09.023]
- Kozik AJ, Nakatsu CH, Chun H, Jones-Hall YL. Age, sex, and TNF associated differences in the gut microbiota of mice and their impact on acute TNBS colitis. *Exp Mol Pathol* 2017; **103**: 311-319 [PMID: 29175304 DOI: 10.1016/j.yexmp.2017.11.014]
- Yi S, Wang W, Bai F, Zhu J, Li J, Li X, Xu Y, Sun T, He Y. Antimicrobial effect and membrane-active mechanism of tea polyphenols against *Serratia marcescens*. *World J Microbiol Biotechnol* 2014; **30**: 451-460 [PMID: 23979827 DOI: 10.1007/s11274-013-1464-4]
- Koo MW, Cho CH. Pharmacological effects of green tea on the gastrointestinal system. *Eur J Pharmacol* 2004; **500**: 177-185 [PMID: 15464031 DOI: 10.1016/j.ejphar.2004.07.023]
- Kiss T, Timár Z, Szabó A, Lukács A, Velky V, Oszlanczi G, Horváth E, Takács I, Zupkó I, Csopor D. Effect of green tea on the gastrointestinal absorption of amoxicillin in rats. *BMC Pharmacol Toxicol* 2019; **20**: 54 [PMID: 31470904 DOI: 10.1186/s40360-019-0332-8]



Published by **Baishideng Publishing Group Inc**
7041 Koll Center Parkway, Suite 160, Pleasanton, CA 94566, USA

Telephone: +1-925-3991568

E-mail: bpgoffice@wjgnet.com

Help Desk: <https://www.f6publishing.com/helpdesk>

<https://www.wjgnet.com>

