



OPEN ACCESS

EDITED BY
Yang Ye,
Peking University Third Hospital, China

REVIEWED BY
Saurabh Singh,
Lovely Professional University, India

*CORRESPONDENCE
Jianqiao Fang
✉ fangjianqiao7532@163.com
Xiaomei Shao
✉ shaoxiaomei@zcmu.edu.cn

RECEIVED 24 December 2024
ACCEPTED 11 July 2025
PUBLISHED 24 September 2025

CITATION
Sun H, Fang J and Shao X (2025)
Commentary: The effects of acupuncture on
patients with premature ovarian insufficiency
and polycystic ovary syndrome: an umbrella
review of systematic reviews and
meta-analyses. *Front. Med.* 12:1551033.
doi: 10.3389/fmed.2025.1551033

COPYRIGHT
© 2025 Sun, Fang and Shao. This is an
open-access article distributed under the
terms of the [Creative Commons Attribution
License \(CC BY\)](#). The use, distribution or
reproduction in other forums is permitted,
provided the original author(s) and the
copyright owner(s) are credited and that the
original publication in this journal is cited, in
accordance with accepted academic practice.
No use, distribution or reproduction is
permitted which does not comply with these
terms.

Commentary: The effects of acupuncture on patients with premature ovarian insufficiency and polycystic ovary syndrome: an umbrella review of systematic reviews and meta-analyses

Haomin Sun, Jianqiao Fang* and Xiaomei Shao*

Key Laboratory of Acupuncture and Neurology of Zhejiang Province, The Third Affiliated Hospital of Zhejiang Chinese Medical University, The Third Clinical Medical College, Zhejiang Chinese Medical University, Hangzhou, China

KEYWORDS

commentary, acupuncture, premature ovarian insufficiency, polycystic ovary syndrome, systematic reviews and meta-analyses, critical interpretive synthesis

A Commentary on

The effects of acupuncture on patients with premature ovarian insufficiency and polycystic ovary syndrome: an umbrella review of systematic reviews and meta-analyses

by Bai, T., Deng, X., Bi, J., Ni, L., Li, Z., and Zhuo, X. (2024). *Front. Med.* 11:1471243.
doi: 10.3389/fmed.2024.1471243

Introduction

We read with interest the study by Tianyu Bai et al. entitled “The effects of acupuncture on patients with premature ovarian insufficiency and polycystic ovary syndrome: an umbrella review of systematic reviews and meta-analyses” (1). Indeed, because of the large fluctuations in follicle stimulating hormone (FSH), the diagnosis and prognosis of premature ovarian insufficiency (POI) lacks a stable indicators (2, 3). In addition, In 2017, JAMA published a Chinese randomized clinical trial (RCT) suggesting that acupuncture does not improve live birth rates in Chinese patients with polycystic ovary syndrome (PCOS) and does not support acupuncture for infertility in such patients (4). In this meta-analysis, Tianyu Bai et al. reported that in patients with PCOS, acupuncture therapy was significantly associated with higher pregnancy rates, ovulation rates, and lower serum luteinizing hormone (LH), testosterone, LH/follicle stimulating hormone (FSH), insulin resistance, and BMI levels. For POI, acupuncture significantly improved serum FSH, LH, LH/FSH ratio, and estradiol levels. They also proposed that acupuncture may improve hormone imbalance in patients with POI through improvement of ovarian function, modulation of the hypothalamic–pituitary–ovarian (HPO) Axis, and reduction of stress by two basic research studies on PCOS. The original authors therefore concluded that acupuncture-related therapies may improve pregnancy rates and metabolic and hormonal imbalances in patients with POI and PCOS (1).

Discussion

Firstly, the pathophysiology of POI and PCOS is different, which may increase the heterogeneity between studies, complicate the analysis process, and reduce the reliability and accuracy of the results (5, 6). The final results of the article are positive, but the mechanistic pathways behind these results, in particular the differences between acupuncture treatment in POI (marked by follicular depletion and hypoestrogenism) and PCOS (characterized by follicular excess and hyperandrogenism), have not been fully explored. A more in-depth analysis of these perspectives may shed light on why similar interventions produce different outcomes, thereby guiding the development of treatments for these clinically distinct disorders.

In addition, the authors mention that recent meta-analyses on the therapeutic effects of acupuncture in women with POI and PCOS have provided conflicting results with positive (7) or ineffective (8) results. Also, in their final conclusion, the authors mention the need for large-scale RCTs with rigorous methodological standards so that the role of acupuncture in these patients can be better understood through systematic reviews and meta-analyses. Therefore, in the context of the current lack of high-quality RCTs and the different meta-analyses showing different results, applying critical interpretive synthesis (CIS) to provide clinicians and patients with more comprehensive guidance may be a more appropriate approach (9, 10). CIS not only focuses on the aggregation of data, but also provides a deeper understanding of the complexity of the findings through critical analysis (11). At the same time, CIS can also provide theoretical directions and research ideas for further studies, guiding researchers to explore new areas of acupuncture treatment in depth (12). Authors can also combine the two methods of systematic review and meta-analysis and CIS (13) to complement each other's strengths and weaknesses, so as to assess the efficacy and application value of acupuncture in these two diseases in a more comprehensive and in-depth manner.

The authors performed searches of many databases, which is commendable. However, the authors' search terms were not comprehensive enough compared to previous acupuncture studies (14, 15). The search terms for acupuncture as a primary intervention should also include the words such as acupoints, meridian, and warm needling, and perhaps these would have also searched for some higher quality studies for this systematic evaluation and meta-analysis. In addition, the Chinese databases could also be searched for TCM terms for diseases in order to search more carefully for all the studies needed (16, 17).

We applaud the strengths of this umbrella review of systematic reviews and meta-analyses, including the large number of studies

analyzed, the large sample size, and the examination of a variety of clinically-important outcomes. In addition, although the authors also performed subgroup analyses based on the type of treatment, given that individual patient characteristics, such as BMI, disease severity, and genetic factors, may influence the response to and outcome of acupuncture treatment (18, 19). It would be valuable to analyze how these individual factors interact with acupuncture and influence treatment outcomes in future studies (18, 20). This could involve subgroup analyses based on these characteristics to identify subgroups of patients more likely to benefit from acupuncture.

Author contributions

HS: Formal analysis, Writing – original draft. JF: Writing – review & editing. XS: Funding acquisition, Supervision, Writing – review & editing.

Funding

The author(s) declare that financial support was received for the research and/or publication of this article. The study was funded by the Ministry of Science and Technology of the People's Republic of China (2022YFC3500401).

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Generative AI statement

The author(s) declare that no Gen AI was used in the creation of this manuscript.

Publisher's note

All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

References

1. Bai T, Deng X, Bi J, Ni L, Li Z, Zhuo X. The effects of acupuncture on patients with premature ovarian insufficiency and polycystic ovary syndrome: an umbrella review of systematic reviews and meta-analyses. *Front Med.* (2024) 11:1471243. doi: 10.3389/fmed.2024.1471243
2. Panay N, Anderson RA, Nappi RE, Vincent AJ, Vujovic S, Webber L, et al. Premature ovarian insufficiency: an international menopause society white paper. *Climacteric.* (2020) 23:426–46. doi: 10.1080/13697137.2020.1804547
3. Zhang J, Chen H, Yu H, Tao F, Jiang Q. Study on the application of combined test of anti-müllerian hormone and sex hormone in the diagnosis of early onset ovarian insufficiency. *Matern Child Health Care China.* (2023) 38:1652–5. doi: 10.19829/j.zgfybj.issn.1001-4411.2023.09.027
4. Wu X-K, Stener-Victorin E, Kuang H-Y, Ma H-L, Gao J-S, Xie L-Z, et al. Effect of acupuncture and clomiphene in Chinese women with polycystic ovary syndrome: a randomized clinical trial. *JAMA.* (2017) 317:2502–14. doi: 10.1001/jama.2017.7217

5. ESHRE guideline: management of women with premature ovarian insufficiency. *Hum Reprod.* (2016) 31:926–37. doi: 10.1093/humrep/dew027
6. Balen A. The pathophysiology of polycystic ovary syndrome: trying to understand PCOS and its endocrinology. *Best Pract Res Clin Obstet Gynaecol.* (2004) 18:685–706. doi: 10.1016/j.bpobgyn.2004.05.004
7. Chen X, Lan Y, Yang L, Liu Y, Li H, Zhu X, et al. Acupuncture combined with metformin versus metformin alone to improve pregnancy rate in polycystic ovary syndrome: a systematic review and meta-analysis. *Front Endocrinol.* (2022) 13:978280. doi: 10.3389/fendo.2022.978280
8. Yu C, Ma C, Xiong Y, Wu M, Shen F, Zhou Y, et al. Effectiveness of acupoint catgut embedding therapy for polycystic ovary syndrome: a systematic review and meta-analysis. *World J Acupunct Moxibustion.* (2017) 27:41–51. doi: 10.1016/S1003-5257(18)30010-2
9. Therapeutic use of the humanoid robot, Telenoid, with older adults: a critical interpretive synthesis review: assistive technology: Vol 36, No 5-get access. Available online at: <https://www.tandfonline.com/doi/full/10.1080/10400435.2022.2060375> (Accessed December 22, 2024).
10. Dixon-Woods M, Cavers D, Agarwal S, Annandale E, Arthur A, Harvey J, et al. Conducting a critical interpretive synthesis of the literature on access to healthcare by vulnerable groups. *BMC Med Res Methodol.* (2006) 6:35. doi: 10.1186/1471-2288-6-35
11. Flemming K. Synthesis of quantitative and qualitative research: an example using critical interpretive synthesis. *J Adv Nurs.* (2010) 66:201–17. doi: 10.1111/j.1365-2648.2009.05173.x
12. Clark MT, Clark RJ, Toohey S, Bradbury-Jones C. Rationales and treatment approaches underpinning the use of acupuncture and related techniques for plantar heel pain: a critical interpretive synthesis. *Acupunct Med.* (2017) 35:9–16. doi: 10.1136/acupmed-2015-011042
13. Wakefield D, Bayly J, Selman LE, Firth AM, Higginson IJ, Murtagh FE. Patient empowerment, what does it mean for adults in the advanced stages of a life-limiting illness: a systematic review using critical interpretive synthesis. *Palliat Med.* (2018) 32:1288–304. doi: 10.1177/0269216318783919
14. Zhang J, Zhang Z, Huang S, Qiu X, Lao L, Huang Y, et al. Acupuncture for cancer-related insomnia: a systematic review and meta-analysis. *Phytomedicine.* (2022) 102:154160. doi: 10.1016/j.phymed.2022.154160
15. Jiang D, Lin H, Yu Z, Wang M. Meta-analysis of the efficacy of acupuncture and moxibustion in the treatment of polycystic ovary syndrome. *World J Acupunct Moxibustion.* (2024) 34:282–91. doi: 10.1016/j.wjam.2024.09.006
16. Yang H. *Factors Influencing the Efficacy of Acupuncture for Early-Onset Ovarian Insufficiency and Machine Learning Pregnancy Prediction.* Beijing: Chinese Academy of Traditional Chinese Medicine (2023). doi: 10.27658/d.cnki.gzzzy.2022.000086
17. Zhang G. *A meta-analysis of acupuncture for infertility due to polycystic ovary syndrome.* Harbin: Heilongjiang University of Traditional Chinese Medicine (2012).
18. Han J. Research on acupuncture anesthesia-analgesia. *Zhen Ci Yan Jiu.* (2016) 41:377–87. doi: 10.13702/j.1000-0607.2016.05.001
19. Witt CM, Schützler L, Lüdtker R, Wegscheider K, Willich SN. Patient characteristics and variation in treatment outcomes: which patients benefit most from acupuncture for chronic pain? *Clin J Pain.* (2011) 27:550. doi: 10.1097/AJP.0b013e31820dfbf5
20. Mayor DF, McClure LS, Clayton McClure JH. Individual differences in responsiveness to acupuncture: an exploratory survey of practitioner opinion. *Medicines.* (2018) 5:85. doi: 10.3390/medicines5030085