

ORIGINAL RESEARCH ARTICLE

Effect of a herbal galactagogic formula combined with auricular acupressure on breast milk production and hormonal profiles in women with postpartum hypogalactia: A randomized controlled study

DOI: 10.29063/ajrh2026/v30i9.4

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Abstract

Postpartum hypogalactia is a common condition that may impair breastfeeding and maternal–infant health. This randomized controlled study evaluated the efficacy of a herbal galactagogic decoction combined with auricular acupressure in improving lactation outcomes. A total of 104 women with postpartum hypogalactia were enrolled between July 2023 and June 2025 and randomly assigned to a control group (auricular acupressure alone, n=52) or an intervention group (auricular acupressure plus herbal decoction, n=52) for 2 weeks. Primary outcomes included breast milk production and formula supplementation, while secondary outcomes comprised serum hormone levels (estradiol, progesterone, and prolactin), symptom scores, psychological status, and clinical effectiveness. Both groups showed significant post-treatment improvements ($P<0.05$). Compared with the control group, the intervention group demonstrated lower estradiol and progesterone levels, higher prolactin levels, increased milk production, and reduced formula supplementation ($P<0.05$). Symptom scores and anxiety/depression levels were also significantly improved. The overall effective rate was higher in the intervention group (96.15% vs 80.77%, $P<0.05$), with comparable safety profiles. This combined therapy appears to be a safe and effective complementary approach for improving lactation in women with postpartum hypogalactia. (*Afr J Reprod Health* 2026; 30 [9]: 46-54).

Keywords: Postpartum hypogalactia; breastfeeding; auricular acupressure; prolactin; maternal health.

Résumé

L'hypogalactie post-partum est une affection fréquente pouvant compromettre l'allaitement et la santé maternelle et infantile. Cette étude randomisée contrôlée a évalué l'efficacité d'une décoction galactagogue à base de plantes associée à l'acupression auriculaire pour améliorer les résultats de lactation. Au total, 104 femmes atteintes d'hypogalactie post-partum ont été recrutées entre juillet 2023 et juin 2025 et réparties aléatoirement en un groupe témoin (acupression auriculaire seule, n=52) et un groupe intervention (acupression auriculaire associée à une décoction à base de plantes, n=52) pendant 2 semaines. Les critères de jugement principaux comprenaient la production de lait maternel et le volume de supplémentation en lait artificiel, tandis que les critères secondaires incluaient les niveaux hormonaux sériques (estradiol, progestérone et prolactine), les scores symptomatiques, l'état psychologique et l'efficacité clinique. Les deux groupes ont montré des améliorations significatives après le traitement ($P<0,05$). Comparé au groupe témoin, le groupe intervention présentait des niveaux plus faibles d'estradiol et de progestérone, des niveaux plus élevés de prolactine, une production de lait accrue et une réduction de la supplémentation ($P<0,05$). Les scores symptomatiques ainsi que les niveaux d'anxiété et de dépression ont également été significativement améliorés. Le taux global d'efficacité était plus élevé dans le groupe intervention (96,15 % vs 80,77 %, $P<0,05$), sans différence significative en termes d'effets indésirables. Cette thérapie combinée pourrait constituer une approche complémentaire sûre et efficace pour améliorer la lactation chez les femmes présentant une hypogalactie post-partum. (*Afr J Reprod Health* 2026; 30 [9]: 46-54).

Mots-clés: Hypogalactie post-partum ; allaitement ; acupression auriculaire ; prolactine ; santé maternelle

Introduction

Postpartum lactation insufficiency, also referred to as postpartum hypogalactia, is a common condition during the puerperium, with a reported incidence of approximately 20%–30%, and is mainly characterized by insufficient milk secretion to meet the infant's feeding needs.¹ Previous studies have shown that postpartum lactation failure is associated with endocrine imbalance, blood loss, psychological stress, nutritional deficiency, and breastfeeding technique problems.^{2,3} At present, routine management mainly includes breastfeeding guidance, psychological support, nutritional optimization, and, in selected cases, pharmacologic or physical stimulation; however, the overall effect is sometimes unsatisfactory and drug-related adverse reactions may limit acceptance.³

Recent systematic reviews have suggested that acupoint stimulation and traditional Chinese medicine (TCM)-assisted interventions may improve milk output and breastfeeding outcomes in women with postpartum hypogalactia.^{4,5} In addition, some of the component herbs used in lactation-promoting prescriptions, such as Wangbuliuxing and Codonopsis-based preparations, have been reported in clinical or pharmacological studies to support lactation. According to TCM theory, breast milk is transformed from qi and blood associated with the Chong and Ren meridians. Postpartum depletion of qi and blood may therefore lead to insufficient milk production. Based on this rationale, we used a self-formulated lactation-promoting decoction together with auricular acupressure to treat women with postpartum hypogalactia classified as having the qi-and-blood deficiency pattern, with the aim of providing evidence for clinical management.

Methods

General information

A total of 104 women with postpartum hypogalactia classified as having the qi-and-blood deficiency pattern were enrolled from the Department of Gynaecology, Tianjin University Haihe Hospital, Tianjin, China, between July 2023 and June 2025. Participants were randomly assigned, using a random number table, to a control group (n=52) and an intervention group (n=52). Baseline

characteristics were comparable between the 2 groups ($P>0.05$), as shown in Table 1.

Diagnosis, inclusion and exclusion criteria

The diagnosis of postpartum hypogalactia was based on conventional clinical assessment of insufficient milk secretion after delivery.⁶ In addition, participants were classified according to the traditional Chinese medicine (TCM) qi-and-blood deficiency pattern. For international readers, this pattern classification was operationalized as follows: the patient had to present with at least 2 primary manifestations (postpartum absent or reduced milk secretion, breast distension or pain, breast fullness/hardness, thick breast milk, or reduced milk volume) and at least 2 secondary manifestations (poor appetite, mild body heat, chest tightness/distension, or depressed mood), together with compatible tongue and pulse signs recorded by the attending TCM physician.⁷ These TCM criteria were used for syndrome differentiation within the study and not as a substitute for the biomedical diagnosis of postpartum hypogalactia.

Inclusion criteria included (1) term singleton pregnancy; (2) women who met the above diagnostic criteria; (3) those in the postpartum period of within 3 to 42 days of delivery; (4) vaginal delivery; (5) patients who agreed to participate in the fully explained study and who signed informed consent forms; and (6) those with Apgar scores of newborns at birth greater than 7.

The exclusion criteria were: (1) women with maternal breast with lumps; (2) those with liver, kidney, and other organs with serious insufficiency; (3) those receiving drugs affecting milk secretion within the preceding month; (4) those allergic to the study drug; (5) women with related diseases destroying breast tissue, such as congenital developmental defects of the breast, mastitis, etc.; (6) those with combined with endocrine disorders combined with hematologic disorders; and (8) women with infectious diseases.

Treatment

After enrollment, both groups received standardized routine lactation support. This included guidance on hand hygiene and cleansing of the areola and nipple with a towel moistened with warm boiled water; encouragement to place the newborn to the breast

Table 1: Comparison of the general information of the 2 groups ($\bar{x} \pm s$, cases)

Groups	Number of examples	Age (years)	Body mass index (kg/m ²)	Number of pregnancies (times)	The time of birth	Milk secretion Decreased milk production	No milk production
Observation Group	52	28.41±2.73	22.67±3.25	1.38±0.29	1.17±0.26	32	20
Control Group	52	28.85±2.61	22.32±3.41	1.34±0.32	1.22±0.28	34	18

first at each feeding; instruction on correct breastfeeding posture and latch to reduce nipple trauma and improve milk transfer; standardized dietary advice, with avoidance of cold, highly irritating, or difficult-to-digest foods; and postpartum psychological support with sleep guidance. Exclusive breastfeeding was encouraged whenever the mother's milk supply was clinically sufficient and the infant fed effectively. When breast milk was considered temporarily inadequate, formula supplementation was permitted and carefully recorded as an outcome measure.

The control group received auricular acupressure alone. After routine disinfection and cleaning of both auricles, the practitioner selected the bilateral auricular points corresponding to the chest/breast area, Shenmen, liver area, spleen-stomach area, and sympathetic area. Vaccaria (Wangbuliuxing) seeds fixed on adhesive tape were applied to the selected points. Approximately 30 min before each breastfeeding session, the participant or therapist pressed the taped points 3–5 times until a sensation of soreness, numbness, heat, or distension (deqi) was achieved. The tapes were replaced every 3 days. On the basis of the same auricular acupressure regimen, the intervention group additionally received a self-formulated lactation-promoting decoction consisting of Wangbuliuxing 10 g, Glycyrrhiza glabra 6 g, Astragalus membranaceus 12 g, Angelica sinensis 12 g, Atractylodes macrocephala 10 g, Tongzhi 30 g, Codonopsis pilosula 12 g, and Andrographis paniculata 6 g. One daily dose was decocted in water to yield approximately 200 mL of liquid, which was divided into 2 oral doses per day. Both groups were treated for 2 weeks.

Observation indicators

(1) Traditional Chinese Medicine (TCM) Symptoms Score: the clinical efficacy of the

patients was assessed before and after the treatment with reference to the literature⁸, respectively, in which the primary symptom was 0–6 points and the secondary symptom was 0–3 points, and the scores were positively proportional to the severity of the patients' TCM symptoms. (2) Serum hormone levels: 4 mL of venous blood was collected from patients before and after treatment, serum was centrifuged (time: 15 min, rotational speed: 3500 r/min, radius: 13.5 cm), and estradiol, progesterone, and prolactin were measured by the JC12-NSA-400 Automatic Biochemistry Analyzer (Beijing Furei Hengchuang Science and Technology Co., Ltd., Beijing, China). (3) Milk supplementation volume and milk production volume: Record the milk supplementation volume and milk production volume for two groups before and after treatment.

Milk production volume = newborn weight × 20 - total amount of formula milk powder supplemented to the newborn daily. (4) Clinical efficacy: clinical efficacy was assessed after treatment with reference to the literature⁸, cured: sufficient milk, reduction of ≥95% in TCM symptom scores, prolonged non-feeding, overflowing milk, breast distension; demonstrated efficacy: reduction of 70%~<95% in TCM symptom scores, occasional addition of milk, predominantly breastfeeding, and a significant increase in breast milk secretion; Effective: the TCM symptom score decreased by 30%~<70%, the amount of added milk decreased, and the milk production increased, but could not meet the demand for breastfeeding; Ineffective: the TCM symptom score decreased by <30%, and the milk production did not increase or even decreased. The total effective rate is the sum of the percentage of effective, obvious effect and cured. (5) Negative emotions: patients' negative emotions were evaluated before and after treatment, and the scores of self-assessment scale for anxiety (SAS)⁸ and self-assessment scale for depression (SDS)⁸ ranged from

20 to 80, and the scores were positively proportional to the severity of patients' negative emotions. (6) Adverse reactions: record the adverse reactions during treatment in the 2 groups.

Statistical analysis

The data of this study were processed through Statistic Package for Social Science (SPSS) 27.0 software (IBM, Armonk, NY, USA). The measurement data were described as $\bar{x} \pm s$ and subjected to t test; the count data were described as n (%) and χ^2 test was performed. Inspection level: $\alpha=0.05$.

Ethical considerations

The study was conducted in accordance with the Declaration of Helsinki. Written informed consent was obtained from all participants before enrollment. The study protocol was reviewed and approved by the Ethics Committee of Tianjin University Haihe Hospital.

Results

Comparison of TCM symptom scores between the two groups

After treatment, the TCM symptom scores of both groups decreased significantly ($P<0.05$). The intervention group showed a greater reduction than the control group, indicating better relief of lactation-related symptoms and associated discomfort ($P<0.05$), as shown in Table 2.

Comparison of serum hormone levels between the two groups

After treatment, serum estradiol and progesterone levels decreased significantly in both groups ($P<0.05$), and the decreases were greater in the intervention group than in the control group ($P<0.05$). Serum prolactin levels increased significantly in both groups after treatment ($P<0.05$), with a greater increase in the intervention group ($P<0.05$). These findings suggest a more favorable endocrine profile for lactation in the combined-treatment group, as shown in Table 3.

Comparison of milk supplementation and lactation in the two groups

After treatment, formula supplementation volume decreased in both groups ($P<0.05$), with a greater reduction in the intervention group ($P<0.05$). Breast milk production increased in both groups ($P<0.05$), and the increase was more marked in the intervention group ($P<0.05$), indicating better restoration of breastfeeding capacity, as shown in Table 4.

Compare the clinical efficacy of the 2 groups

Compared with the control group, the total effective rate of the intervention group was significantly higher ($P<0.05$), which suggests that adding the herbal formula to auricular acupressure improved the overall clinical response, as shown in Table 5.

Comparison of negative emotions in the 2 groups

After treatment, both the Self-Rating Depression Scale (SDS) and Self-Rating Anxiety Scale (SAS) scores decreased in both groups ($P<0.05$), with greater reductions in the intervention group than in the control group ($P<0.05$). This indicates that the combined intervention may also have contributed to improved maternal emotional well-being during the postpartum period, as shown in Table 6.

Safety Comparison

There was no significant difference in the total incidence of adverse events between the 2 groups ($P>0.05$), suggesting that the addition of the herbal formula did not obviously increase short-term safety risk during the 2-week treatment period, as shown in Table 7.

Discussion

Modern medicine believes that the etiology of postpartum lack of breast milk includes endocrine disorders (such as insufficient secretion of lactogen), malnutrition, mental stress, excessive blood loss after cesarean section, the effects of chronic diseases (such as hepatitis, heart disease, etc.),

Table 2: Comparison of TCM symptom scores of the 2 groups ($\bar{x}\pm s$, points)

Groups	Number of examples	Main symptom score		Sub-symptomatic score		Total score	
		Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment
Observation Group	52	12.75 $\pm$ 3.65	6.12 $\pm$ 1.73 ^{*Δ}	8.27 $\pm$ 1.98	3.21 $\pm$ 0.94 ^{*Δ}	21.02 $\pm$ 4.38	9.33 $\pm$ 2.02 ^{*Δ}
Control Group	52	12.44 $\pm$ 3.49	8.38 $\pm$ 2.44 [*]	8.35 $\pm$ 1.85	5.13 $\pm$ 1.24 [*]	20.79 $\pm$ 4.44	13.52 $\pm$ 2.82 [*]

Note: Compared with before treatment, ^{*} $P<0.05$; compared with the control group, ^{Δ} $P<0.05$

Table 3: Comparison of serum hormone levels in the 2 groups ($\bar{x}\pm s$)

Groups	Number of examples	Estradiol (pg/mL)		Progesterone (ng/mL)		Lactogen (ng/mL)	
		Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment
Observation Group	52	132.43 $\pm$ 15.67	52.04 $\pm$ 6.58 ^{*Δ}	218.76 $\pm$ 22.65	7.19 $\pm$ 1.84 ^{*Δ}	198.72 $\pm$ 22.53	397.45 $\pm$ 42.56 ^{*Δ}
Control Group	52	131.08 $\pm$ 15.11	73.85 $\pm$ 9.72 [*]	221.04 $\pm$ 23.92	15.62 $\pm$ 3.79 [*]	201.41 $\pm$ 23.60	331.06 $\pm$ 35.73 [*]

Note: Compared with before treatment, ^{*} $P<0.05$; compared with the control group, ^{Δ} $P<0.05$

Table 4: Comparison of milk supplementation and lactation in 2 groups ($\bar{x}\pm s$, mL)

Groups	Number of examples	Complementary milk volume		Lactation amount	
		Before treatment	After treatment	Before treatment	After treatment
Observation Group	52	409.35 $\pm$ 46.28	15.23 $\pm$ 3.25 ^{*Δ}	89.73 $\pm$ 10.52	139.45 $\pm$ 16.33 ^{*Δ}
Control Group	52	412.72 $\pm$ 47.85	36.19 $\pm$ 6.57 [*]	91.08 $\pm$ 10.97	112.37 $\pm$ 13.46 [*]

Note: Compared with before treatment, ^{*} $P<0.05$; compared with the control group, ^{Δ} $P<0.05$

Table 5: Comparison of clinical outcomes [n (%)]

Groups	Number of examples	Heal and recover completely	Produce an effect	Validity	Null	Overall effectiveness rate
Observation Group	52	18 (34.62)	18 (34.62)	14 (26.92)	2 (3.85)	50 (96.15) [*]
Control Group	52	13 (25.00)	16 (30.77)	13 (25.00)	10 (19.23)	42 (80.77)

Note: Comparison with control group, ^{*} $P<0.05$

Table 6: Comparison of negative emotions between 2 groups ($\bar{x}\pm s$, scores)

Groups	Number of examples	SDS scores		SAS scores	
		Before treatment	After treatment	Before treatment	After treatment
Observation Group	52	56.43 $\pm$ 6.72	36.06 $\pm$ 4.18 ^{*Δ}	55.26 $\pm$ 6.15	35.12 $\pm$ 4.27 ^{*Δ}
Control Group	52	55.17 $\pm$ 6.30	41.78 $\pm$ 5.34 [*]	55.91 $\pm$ 6.43	40.28 $\pm$ 5.79 [*]

Note: Compared with before treatment, ^{*} $P<0.05$; compared with the control group, ^{Δ} $P<0.05$

Table 7: Comparison of safety [n (%)]

Groups	Number of examples	Pruritus	Nausea and vomiting	Total incidence
Observation Group	52	1 (1.92)	2 (3.85)	3 (5.77)
Control Group	52	1 (1.92)	0 (0.00)	1 (1.92)

and congenital mammary gland dysplasia⁹. In addition, adverse emotions, lack of sleep, and overwork can also negatively affect milk secretion¹⁰. At present, there is no effective treatment for postpartum lactation deficiency in Western medicine, which is mainly based on conditioning and supplemented by treatment, and the overall therapeutic effect is poor. Western medical treatments include medication (e.g., oxytocin, vitamin E, methotrexate, etc.) and physical stimulation (e.g., low-frequency pulses, etc.), but these methods are often ineffective in clinical practice and carry the risk of side effects or adverse reactions¹¹. In addition, Western medical treatment usually relies on maternal compliance, and some patients or their families are not very receptive to medication¹². Auricular acupoint pressure has the effect of relieving liver and depression, strengthening the spleen and stomach, and regulating the balance of the body in Chinese medicine theory, which can not only increase the amount of milk secretion, but also improve the degree of breast filling and reduce milk stagnation⁵. However, the pathogenesis of postpartum lactation is complex, and it is difficult to meet the therapeutic needs of some patients by using auricular acupoint pressure therapy alone. Therefore, it is clinically important to find an effective program to assist auricular acupressure in the treatment of postpartum lactation due to weakness of qi and blood.

The main cause of postpartum qi and blood weakness type of breast milk deficiency is qi and blood deficiency. Chinese medicine believes that qi and blood is the basis of human life activities, adequate qi and blood is the normal function of internal organs, qi and blood run smoothly. However, postpartum due to blood loss and Qi depletion during delivery, as well as weak spleen and stomach, dietary disorders and other factors, resulting in insufficient sources of Qi and blood biochemistry, Qi and blood deficiency, thus affecting the production and secretion of breast milk¹³. The spleen and stomach are the source of qi and blood biochemistry, if the spleen and stomach are weak after delivery and the function of transportation and digestion is weakened, the water and grain essences cannot be normally transported and distributed, the qi and blood biochemistry is insufficient, and the source of breast milk is reduced¹⁴. In addition, spleen deficiency may also affect the generation of qi and blood, further

aggravating the state of qi and blood weakness. According to traditional Chinese medicine, breast milk originates from the two channels of Chong Ren, and the prevalence of the two channels of Chong Ren directly affects the production and secretion of breast milk¹³. If postpartum qi and blood are weak and Chong Ren does not flourish, the milk channels will be impassable and the milk cannot be discharged normally, resulting in milk stagnation or insufficient secretion¹⁴. The mechanism of postpartum lactation due to weakness of qi and blood is closely related to postpartum deficiency of qi and blood, weakness of the spleen and stomach, insufficiency of Chong Ren, and impassability of the milk channels. Treatment is recommended to harmonize the Chong Ren, replenish Qi and Blood, promote lactation, strengthen the spleen and benefit the qi. In the formula of Self-designed Lactation Soup, *Radix Codonopsis pilosulae* has the function of nourishing blood and generating fluids, strengthening the spleen and benefiting the lungs; *Wang Bu Liuhang* has the function of decreasing breast milk and swelling, and invigorating blood and promoting menstruation; *Glycyrrhiza glabra* has the function of moderating the nature of the medicine, benefiting the qi and nourishing the middle; *Astragali* has the function of alleviating the weak qi and nourishing qi, tonifying qi and nourishing blood; *Radix angelicae Sinensis* has the function of tonifying and invigorating blood; *Rhizoma Atractylodes Macrocephala* has the function of strengthening spleen and benefitting qi; *Perforata cylindricalis* and *Herba Leonurus tungcao* have the functions of regulating qi and stopping pain, and invigorating blood and promoting the collaterals. The combination of these herbs can alleviate qi deficiency, nourish qi and blood, reduce breast milk and swelling, strengthen the spleen and benefit qi, regulate qi and stop pain, and activate blood circulation, which is in line with the etiology of patients with postpartum lactation deficiency due to qi and blood deficiency, so as to improve the symptoms of the patients in traditional Chinese medicine and enhance the therapeutic effect.

The results of this study showed that after the treatment, the amount of milk replenishment, estradiol, and progesterone were lower, while the amount of lactation and lactogen were higher in the observation group, suggesting that the self-propagated lactation soup combined with auricular

acupressure can regulate the expression of serum estradiol, progesterone, and lactogen of the patients and improve the lactation situation. Modern pharmacological studies¹⁵⁻¹⁷ have shown that flavonoid glycosides in Wang Bu Liuhang can regulate the expression of genes in breast epithelial cells, which can improve cell viability and contribute to milk secretion; *Andrographis paniculata* is able to promote breast milk secretion and increase the level of serum lactogen; and Tong Cao is able to promote lactation of mammary cells and increase the level of milk protein in breast milk. Zhu Yiduo et al⁵ showed that auricular acupressure combined with self-proposed Yiqi and blood replenishing breast milk soup could improve lactation volume in postpartum patients with lactation deficiency and enhance the clinical outcome of patients, and the results of this study were similar. In this study, the SDS scores as well as SAS scores of the observation group were significantly lower compared to those of the control group after treatment, indicating that the combination of auricular acupressure and self-propagating lactation soup could alleviate the patients' adverse emotions. Analysis of Mechanism: Auricular acupressure not only influences neurotransmitter release (e.g., serotonin) through local stimulation but also transmits effects via meridians to corresponding internal organs, thereby regulating the function of emotional centers (e.g., amygdala, prefrontal cortex)¹⁸; The self-formulated lactation-promoting decoction alleviates emotional disorders like anxiety and depression caused by hormonal imbalances or qi and blood deficiency by regulating the endocrine system (e.g., levels of oxytocin and cortisol) and improving qi and blood circulation.¹⁹

Study strengths and limitations

This study has several strengths. It used a randomized controlled design, included clinically relevant outcomes such as milk production, formula supplementation, hormone levels, symptom scores, emotional status, and adverse events, and evaluated a combined intervention that can be implemented in routine postpartum care. At the same time, several limitations should be acknowledged. This was a single-center study with a relatively small sample size, the intervention period was short, and long-

term breastfeeding continuation was not assessed. The study population was limited to women classified as having the qi-and-blood deficiency pattern, which may limit generalizability to other TCM patterns or broader postpartum populations. In addition, blinding was not described, and the estimated milk production method may be less accurate than direct standardized measurement. Therefore, larger multicenter studies with longer follow-up and more rigorous lactation assessment are needed.

Implications for practice

The present findings suggest that combining standardized lactation support with auricular acupressure and an appropriately prescribed herbal formula may be a useful complementary option for women with postpartum hypogalactia, particularly in settings where integrative postpartum care is available. In practice, this approach should not replace breastfeeding counselling, infant feeding assessment, or routine maternal care, but may be considered as an adjunct under professional supervision. At the policy level, the results support further evaluation of evidence-based integrative lactation services and standardized treatment protocols in maternal health settings.

Conclusion

In summary, the study objectives were met to the extent that the combined intervention demonstrated better short-term clinical efficacy than auricular acupressure alone in women with postpartum hypogalactia of the qi-and-blood deficiency pattern. The herbal formula plus auricular acupressure was associated with improved hormone profiles, increased breast milk production, reduced formula supplementation, and better emotional outcomes, without an obvious increase in adverse events. These findings support the potential value of this combined approach as a complementary strategy in postpartum lactation management, while also indicating the need for confirmation in larger and longer-term studies.

Conflict of interests

The authors declare no conflict of interest.

Contribution of authors

Kai li and Dongyan Cai contributed equally to the work

Funding

Not applicable.

Data availability

The datasets generated and/or analyzed during the current study are available from the corresponding author on reasonable request. If required by the journal, the authors are willing to deposit the anonymized dataset in an appropriate institutional or public data repository after acceptance.

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