http://www.ijwhr.net
doi 10.15296/ijwhr.2019.20
Open Access Original Article
IJWHR
International Journal of Women's Health and Reproduction Sciences
Vol. 7, No. 1, January 2019, 124–133
ISSN 2330-4456

A Meta-Analysis of the Efficacy of Panax Ginseng on Menopausal Women's Sexual Function

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Abstract

Objectives: An increase in life expectancy results in the aging population growth. This study was designed to evaluate the efficacy and adverse events of ginseng that could be used as a herbal medicine in women with sexual dysfunction.

Materials and Methods: The authors of this study searched Cochrane Library, MEDLINE, Web of Science, Embase, Scopus, ProQuest, Google Scholar, and Persian databases without a time limitation until May 2018 and examined all the randomized clinical trials (RCTs) that compared the effect of different types of ginseng on sexual function of menopausal women as compared to the placebo controls. The Cochrane risk of bias tool was used to assess the methodological quality of the included studies. The heterogeneity was determined using the I2 index. In addition, standardized mean difference (SMD) was used instead of mean differences (MD) and a random effect was reported instead of fixed effect in meta-analysis.

Results: The eligibility criteria were found in five RCTs. All the included studies were placebo-controlled. Two trials had a parallel design while three studies used a crossover design. Although four trials indicated that ginseng significantly improved sexual function, they didn't report any treatment effect compared to the placebo group. Based on the results of meta-analysis obtained from five studies including 531 women, there was no statistically significant effect of ginseng on female sexual dysfunction (FSD) compared to the placebo control group (SMD: 0.26; 95% CI: -0.26 to 0.76). Nonetheless, there was a considerable heterogeneity among the studies ($I2 = 81\%$; $P < 0.0001$). Moreover, all the included studies assessed adverse events, but in three of the RCTs, there was no significant difference between the placebo and ginseng groups.

Conclusions: The evidence regarding ginseng as a therapeutic agent for sexual dysfunction is unjustifiable. Rigorous studies seem warranted in this respect.

Keywords: Panax ginseng, Menopause, Quality of life, Sexuality, Aging

Introduction

Populations around the world are getting older (1). The aging process is inevitable, leading to progressive structural changes and physiological impairment. Many challenges and opportunities have been created due to this demographic change. Female sexual dysfunction (FSD) is one of the critical challenging fields that can negatively impact the quality of life (2). However, the sexual health of this aging population has often been neglected in the media and academic discourse (3,4). Besides, sexuality has remained a taboo topic in discussions of aging in many cultures. Health efforts are one of the priorities of the health programs for women who make up half of the world's population. Moreover, menopause is one of the most important stages in women's lives and one-third of their lives is at this stage. It is believed that almost 90% of the women reach the age of 65 due to an increase in life expectancy (5).

The FSD may occur at any age but more likely in middle age (6). The process of aging and menopausal state are two important overlapped factors affecting the women's sexuality (7). Since the FSD is a complicated condition during menopause, the therapeutic measures should be in the direction of its multifactorial etiology. There are multiple chronic morbidities around the menopause such as endocrine system diseases, cardiovascular system diseases, dyslipidemias, neurologic disorders, genitourinary system disorders, and psychological disorders that correlate with the event of FSD. Lack of treatment may lead to irreversible consequences of the FSD which is associated with menopause (8).

Another common concern in menopause is the polypharmacy or concurrent use of multiple medications by a patient (9), which causes problems such as adverse drug reactions, drug interactions, and prescribing cascade, creating symptoms that are mistakenly considered as a new medical condition (10,11). Hence, medications which have multifactorial etiology are required in order to cover a wide range of medical problems associated with this period (12). However, conventional drugs that act with the "one gene, one target, one disease" approach do not have this capability (13). Nowadays, pharmacology has come up with a multi-target drug design approach to make new drugs (14,15). The herbal medicine dating

Received 10 October 2017, **Accepted** 11 April 2018, **Available online** 7 May 2018

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thousands of years ago, headed by traditional Chinese medicine, has now faced with the attention of people in the world and researchers (16, 17). Ginseng is one of the globally well-known plants of Chinese herbal medicine (18) and is considered to be an adaptogen (adaptogenic). It is also one of the multi-potential plants that increases body resistance to internal and external stress (19) and can be used to produce plant-based multi-target drug approach (20, 21).

Panax has long been used as a medication and food complement in Asian countries. It is one of the most important adaptogens and general tonic that is broadly consumed in preparing traditional Chinese medicine and a component of western herbal remedy. There are several classifications of ginseng: one of them is based on geographical distribution such as *Panax ginseng* C. A Meyer (Korean ginseng), *Panax quinquefolius* (American ginseng), *Panax notoginseng* (Chinese or Sanchi ginseng) (22), *Panax japonicus* (Japanese ginseng), and other botanical species, although commonly called Siberian ginseng (*Eleutherococcus senticosus*) (23) and Indian ginseng (*Withania somnifera* is well- known as Ashwagandha) (24), are not truly ginseng, but are scientifically compared with each other. These are confusing in the literature. Other classifications are red, white, and row or fresh ginseng which is related to the processing methods and age of harvested ginseng. Among these, Korean Panax ginseng is the most effective species because it contains more types and high concentration of ginsenosides and other beneficial compounds. Panax ginseng belongs to the Araliaceae family which is a perennial neutral shadow-friend plant with dentate leaves and a light-brown fleshy root having a human-like figure. Besides, its native area is the remote regions of East Asia and North America but it is cultivated in East Asia, Russia, and Germany for exportation and production of the herbal medicine (25-27).

Panax consists of various active components that exist in all parts of the herb such as triterpene glycosides or saponins which are commonly called ginsenosides, proteins, amino acids, phenols, alkaloids, polypeptides, and vitamins B_1 and B_2. To date, a variety of 43 different ginsenosides are known. The ginsenoside is categorized into three types, based upon its arrangement and the amount of sugar debris (e.g., glucose, rhamnose, arabinose, & xylose) including Protopanaxadiol (Rb1, Rb2, Rc, & Rd), Protopanaxatriol (Re, Rf, Rg1, & Rg2), and oleanane (Ro) (28).

Nevertheless, the action mechanisms of ginsenosides, namely, the active components that play a critical role in the therapeutic impact of ginseng, are still unidentified. Possible action mechanisms of ginseng that can be effective in improving the FSD include various pathways. First, enhancing the stimulation of nitric oxide production from endothelial cells, which is by relaxing the smooth muscle of the corpus cavernosum resulting in the clitoral erection (29,30). Next, improving blood circulation, enhancing the vasomotor tone, and having potential benefits in improving cardiovascular risk factors (31,32) including hypertension, hyperglycemia, and hyperlipidemia. These risk factors are the underlying elements of the FSD as well. In addition, ginseng has been known as a natural sexual enhancer (33). This feature may result from an increase in physical energy due to the ginseng anti-fatigue effect (34).

Menopause, midlife crisis, and aging are the concepts that affect women's sexuality and, consequently, their quality of life. Because sexual dysfunction is rooted in several factors, treatment with common single-target drugs should not be satisfactory (14). The reason for this choice is its multi-target and multi-purpose property (35). Various therapeutic effects of ginseng in conditions like the quality of life (36), Alzheimer's disease (37), common cold (38), diabetes mellitus (39), hypertension (40) and cardiovascular disease (31), anti-fatigue effect (34), and erectile dysfunction (41) were evaluated in different studies.

Although several systematic reviews have been implemented regarding the impact of ginseng on sexual function of men to date (41-43), to the best knowledge of the authors, such investigation has not been conducted on women in particular. As a result, a systematic review and a meta-analysis was conducted to assess the ginseng's effect on the sexual function of menopausal women.

Materials and Methods

Inclusion and Exclusion Criteria

The study researchers systematically reviewed the randomized clinical trials (RCTs) which were published in English and were conducted on women who were married, had a fixed heterosexual partner or at least one sexual intercourse per month, were affected by sexual dysfunction based on various sexual function questionnaires, and were in pre- and post-menopausal period.

All the studies assessing the sexual function as a primary or secondary outcome and also trials evaluating the quality of life and health status were systematically investigated. Besides, sexual function was among the secondary outcomes or sub-domains of various questionnaires. Since Ashwagandha is popular as Indian ginseng (24) and is often compared to ginseng in the scientific literature (44), the trials related to this plant that was consistent with the goal of the current study were included in this systematic review as well (45). In addition, it is stated that women suffer from different chronic diseases around the menopause. Uncontrolled chronic diseases such as hypertension, diabetes, and other diseases were among the exclusion criteria. In this study, sexual function was compared between the intervention (consuming ginseng) and control (consuming placebo) groups.

Search Strategy and Procedure Selection

The scholars of this study searched a variety of databases

including Cochrane Library, MEDLINE, Web of Science, Embase, Scopus, ProQuest, Google Scholar, and Persian databases (e.g., Magiran, SID, & Barakat) without a time limitation until late May 2018. The search was conducted using the following keywords:

Postmenopaus*[MESH], Perimenopaus*[Mesh], -Menpaus*[Mesh], Ginseng [Mesh], (red ginseng, American ginseng, Siberian ginseng, or Indian ginseng), Panax ginseng or Panax quinquefolius, sexuality [Mesh], Sexual function [Mesh], quality of life [Mesh], women health [Mesh], and sexual activity [Mesh].

Journals related to complementary and alternative medicines (therapy) and *Journal of Ginseng Research* (JGR) were also searched manually. In addition, clinical trial registries like IRCT and EU-CTR were explored to find the unpublished studies. There were 2 studies in the IRCT that were sampling. The researchers reviewed the list of trial references and the related studies were found for inclusion in the review study. Accordingly, one study was extracted. The search strategy was modified based on each of the databases. The data were presented in a PRISMA chart (Figure 1). All the RCTs that compared the effect of any kind of ginseng on women's sexual function with placebo were included in the study. Conversely, those RCTs that made ginseng as a part of the herbal compound were excluded from this study (46). In addition, the abstracts of non-English articles which were published in English were among the inclusion criteria.

Quality Assessment and Data Extraction

The authors collected data from the extracted papers according to the predetermined criteria, which are presented in Table 1. The Cochrane Collaboration tool was used to determine the quality of risk of bias in the included articles (47) in 6 domains, that is, allocation sequences, allocation concealment, bindings, incomplete outcomes, and selected reports. As shown in Table 2, each domain was evaluated in low, high, and unclear risk of the bias. Both authors independently identified the RCTs risk of bias and, in case of disagreement, the final judgment was made with the help of a third person who was specialized in this field. In the following section, the risk of bias for five included studies is mentioned.

Selection bias in all the studies was the low risk that resulted from the sufficient information in the type of randomization, n = 5 (45,48-51). Unclear selection bias was identified as a result of the limitation in the formation of allocation concealment methods (n = 5) (45,48-51). Blinding of personnel, participants, and outcome assessor (low performance bias, n = 5) (45,48-51), incomplete outcome data (low attrition bias, n = 2 (45,51) and high attrition bias, n = 3 (48-50)) and low reporting bias (both primary and secondary outcomes were reported n = 5) were the other criteria for assessing the risk of bias in the included studies. Review Manager (RevMan) software, version 5.3 was used to draw the risk of bias graph and summary (Figures 2 and 3).

Statistical Method

The RevMan software, version 5.3 was employed for data analysis. All the studies reported sexual function as quantitative variables, thus mean and standard deviation

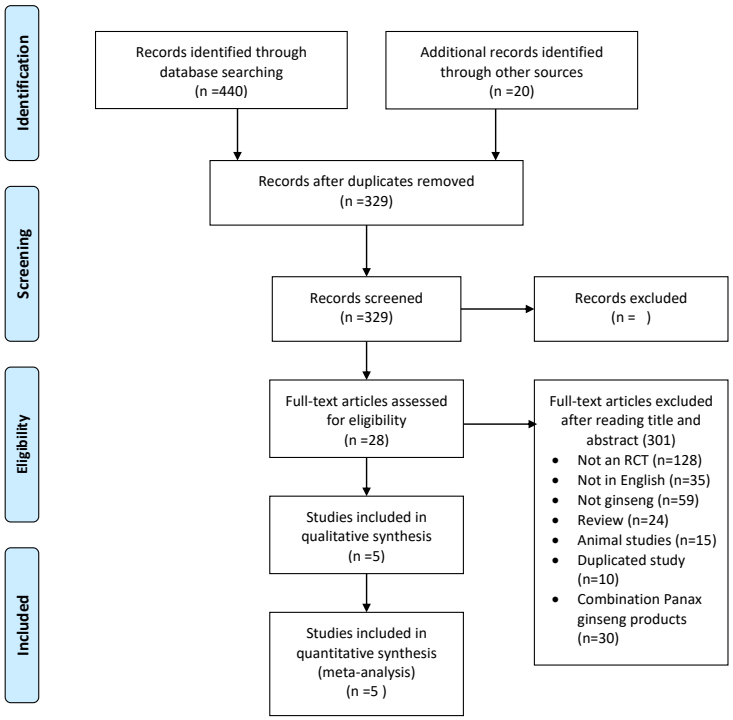

Figure 1. PRISMA Flow Diagram.

Table 1. Characteristics of the Included Studies

Author	Study Design	Sample Size Conditions	Age range	Intervention	Dose (mg/d)	Treatment Duration (wk)	Main Outcome Measures	Adverse Event
Oh et al (48)	Crossover, DB	32 Menopausal women who had not menstruated naturally for at least 1 year	40-60	KRG	3000	8	1)FSFI 2) GAQ	Two cases of vaginal bleeding in KRG treatment group
Chung et al (49)	Crossover DB	41 Premenopausal women who had FSFI<26.5 in the initial evaluation	31-51	KRG	3000	8	FSFI	A mild gastric discomfort after KRG intake
Kim et al (50)	Crossover, DB	24 married women with FSFI <25	30-45	Red Ginseng	6000 mg daily	6	1) FSFI 2) SF-36	There was no significant adverse event related to red ginseng.
Dongre et al (45)	Parallel DB	50 women who had baseline total scores of FSFI <25 or FSDS <11	21-50	Indian Ginseng	300 mg twice per day	8	1) FSFI 2) FSDS	No adverse effects of therapy were observed in the drug group.
Wiklund et al (51)	Parallel DB	384 postmenopausal women (who had not menstruated naturally for at least 6 months and had hot flashes in at least 3 of the previous 7 days)	45–65	Ginseng (Ginsana)	200 mg/d effective compound: G115	16	1) WHQ 2) PGWBI	181 women reported but no significant difference between the 2 groups: Influenza or cold (45); a eadache and migraine (18); diarrhea and gastrointestinal (40)

DB: Double-blinded; FSFI: Female Sexual Function Index; KRG: Korean red Ginseng; GAQ: Global assessment questionnaire; SF-36: 36-item short form health survey; WHQ: Women's health questionnaire; FSDS: Female sexual distress scale; PGWBI: Psychological general well-being index.

(SD) were extracted from each of the papers. One study used a different tool to evaluate sexual function (51), therefore, standardized mean difference (SMD) was reported instead of the MDs (44). Besides, heterogeneity was evaluated using I squared (I^2) and due to the high heterogeneity of the studies, the random effect was reported instead of the fixed effect.

Results

Selection and Characteristics of the Included Studies

Overall, 460 papers were found in the databases out of which 131 of them were omitted because they were repetitive. Besides, the remaining papers were screened by reviewing either their titles and abstracts (301 papers) or their full texts (23 papers). Reviewing the articles it was revealed that 128 studies were not clinical trials and 45 had not assessed the intervention of our interest. Finally, five articles were selected (Figure 1). Two trials had a parallel design (45,51) while three studies used a crossover design (48-50). Participants in all the included studies were assigned into two groups. The control group consumed placebo in all the studies. Sample size ranged from 24 to 384 participants. Doses of the consumed ginseng in the included studies varied between 200 and 6000 mg daily. High and low doses contained dried ginseng root powder and effective compounds, respectively. The studies belonged to different contexts including Korea (48-50), Sweden (51), and India (45).

In one of the trials, an improvement of sexual function was reported in postmenopausal women by Korean red ginseng (KRG). However, no statistically significant differences were observed compared with the placebo group (49). In another study, although the total score of the female sexual function index (FSFI) in the KRG group slightly raised, these changes were not noticeable in comparison with the placebo group (48). In another Korean RCT with a crossover design, the group that first was a placebo and then received ginseng had a progressive improvement in sexual function compared to all the participants (50). Interventions with Ginsana in postmenopausal women did not significantly change the Women Health Questionnaire (WHQ) sexual domain (51). An interventional analysis of Indian ginseng indicated that the intervention group had a statistically considerable score of sexual function compared to the placebo group (45).

All the RCTs evaluated the side events, but they were reported only in 3 RCTs (48,49,51). In one of the RCTs, 2 cases of vaginal bleeding (48) and in another one, a digestive discomfort (49) were reported in the ginseng group, which were likely to be associated with the ginseng. Moreover, in another study, the number of reported adverse events was high (51). In addition, the most commonly reported side events were influenza or

Table 2. Risk of Bias in the Included Studies

First Author (y) (Reference)	Author's Judgment	Support for Judgment
Oh et al (2010) (45)		
Random sequence generation	Low risk	The method of random permuted blocks was used to randomly allocate women to either the KRG first or placebo first treatment group.
Allocation concealment	Unclear risk	No specific information was given regarding allocation concealment.
Blinding of personnel	Low risk	All the participants, investigators, pharmacists, and study personnel were blinded to the treatment allocation.
Blinding of participant	Low risk	A placebo was made in capsule form containing starch to mimic the KRG capsule and the capsules were identical in appearance with similar taste and flavor.
Blinding of outcome assessment	Low risk	The study was a randomized, double-blind, placebo-controlled cross-over study
Incomplete outcome data	High risk	4 dropped out during the study because of a lack of subjective improvement. After completion of the trial, four subjects (one from the KRG first group and three from the placebo-first group) were excluded from the analysis because of an absence of intercourse attempts during the trial.
Selective reporting	Low risk	Not suspected.
Chung et al. (2015) [42]		
Random sequence generation	Low risk	The participants were randomly divided into two groups.
Allocation concealment	Unclear risk	No specific information was provided regarding the allocation concealment.
Blinding of personnel	Low risk	This study was double-blinded that all the subjects, investigators, pharmacists, and study staff did not know in which group the subjects were enrolled.
Blinding of participant	Low risk	A placebo capsule contains starch to mimic the KRG capsule. The flavor and the appearance of the two capsules were identical.
Blinding of outcome assessment	Low risk	The study was a randomized, double-blind, cross-over study.
Incomplete outcome data	High risk	Of a total of 41 subjects, 9 of them were excluded. One subject wanted to quit due to the side effect (gastric discomfort) and 8 subjects dropped out during the study because of a lack of subjective improvement.
Selective reporting	Low risk	Not suspected.
Kim et al. (2009) [43]		
Random sequence generation	Low risk	A randomized study.
Allocation concealment	Unclear risk	No specific information was provided regarding the allocation concealment.
Blinding of personnel	Low risk	Double-blind.
Blinding of participant	Low risk	Double-blind.
Blinding of outcome assessment	Low risk	Double-blind.
Incomplete outcome data	Low risk	Few and balanced dropout (Overall, 23 out of 24 participants completed the study).
Selective reporting	Low risk	Not suspected.
Dongre et al. (2015) [39]		
Random sequence generation	Low risk	Fifty female subjects were randomly assigned either to the ginseng-treated group (Group A; n = 25) or to the placebo-treated group (Group B; n = 25) in a randomized fashion.
Allocation concealment	Unclear risk	No specific information was given regarding the allocation concealment.
Blinding of personnel	Low risk	Double-blind.
Blinding of participant	Low risk	They provided the extract and the placebo powder to a local laboratory which then put these into hard gelatin capsules of identical size, shape, color, and texture.
Blinding of outcome assessment	Low risk	Double-blind.
Incomplete outcome data	Low risk	None of the 50 enrolled women was withdrawn from the study for any reason.
Selective reporting	Low risk	Not suspected.
Wiklund et al. (1999) [44]		
Random sequence generation	Low risk	A randomized, multicenter, double-blind, parallel group study.
Allocation concealment	Unclear risk	No specific information was given regarding the allocation concealment.
Blinding of personnel	Low risk	Double-blind.
Blinding of participant	Low risk	Double-blind.
Blinding of outcome assessment	Low risk	Double-blind.
Incomplete outcome data	Low risk	The questionnaires were completed by 193 women treated with ginseng while 191 of them were treated with placebo (N = 384 participants).
Selective reporting	Low risk	Not suspected.

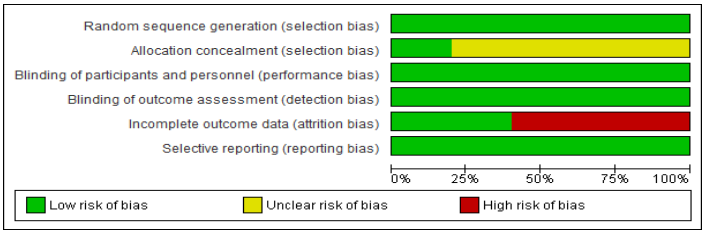

Figure 2. Risk of Bias Graph.

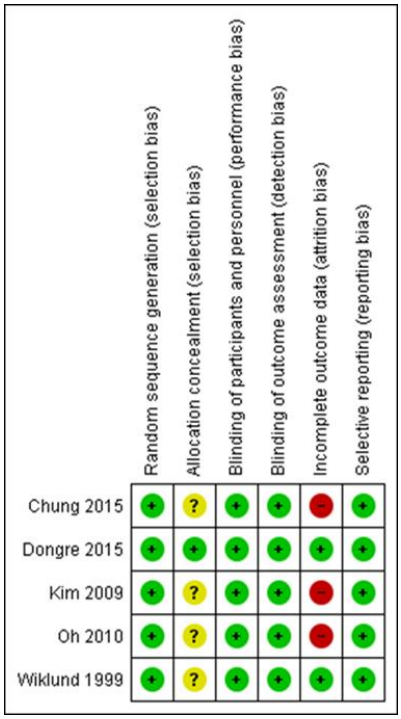

Figure 3. Risk of bias summary.

common cold (n = 45), headache and migraine (n = 18), and also diarrhea and gastrointestinal (n = 40) (Table 1).

Effects of Ginseng (Meta-Analysis Results)

The meta-analysis of the five included studies (with 531 participants) did not approve a significant effect of ginseng on menopausal women's sexual function compared to the placebo group [SMD = 0.26; 95% CI: -0.26 to 0.76]. However, there was a considerable heterogeneity among the studies (I^2 = 81%; P < 0.0001) (Figure 4).

Discussion

This present review summarized and evaluated information about the efficacy and safety of ginseng on FSD. As stated by the authors, it is the first meta-analysis to be conducted so far. Totally, the number of performed or published RCTs about the impact of ginseng on the FSD is limited. Probably, since most of the RCTs on ginseng were implemented in Korea while not being included in systematic reviews because they were not published in English. To solve this important issue, a trial including an abstract (in English) and the entire text of the article (in Korean) was included in the present systematic review (50). Based on the findings, it was revealed that the final result of the meta-analysis did not support the ginseng effect on female sexual function. However, since the number of RCTs included and their sample size was not sufficient, it was not logical to draw a final result about the impact of ginseng on female sexual function.

Although all the studies were randomized and double-blinded, only one of them mentioned the method of randomization, but none of them pointed allocation concealment. One of the problems that threaten such studies is performance bias and that the therapeutic effects of these studies may be over-expressed.

Furthermore, the type of ginseng, the availability, and the content of its active constituent ginsenosides at the preparation time may affect its therapeutic effects. However, the exact optimal dose of ginseng is still unclear. As previously mentioned, the doses used in the included studies ranged from 200 to 6000 mg. Two studies used an effective compound of 200-300 mg (45,51) while three other studies used dried plant powder (48-50).

Adverse events reported on ginseng were low or either mild or possibly were not related to the effects of ginseng. They were probably dependent on the type of ginseng. In the included studies, 2 cases of vaginal bleeding (48) that may be related to the anticoagulant effects of ginseng and one case with digestive discomfort were reported in the ginseng group (49). In one of the RCTs, nearly half of the participants reported the side events (51), however, there was no statistically significant difference between the groups in terms of adverse events and most reported cases, for example, influenza and common cold were not associated with the ginseng (Table 1).

All of the included studies used a valid and specific questionnaire known as FSI to assess sexual function, except for a study that used one of the WHQ domains for sexual function evaluation (51), which may not have sufficient sensitivity to detect the changes in sexual function.

In this regard, the last two systematic reviews that were published in 2013 and 2016 summarized and evaluated the effects of ginseng on different outcome variables such as menopausal symptoms, sexual function, quality of life, endometrial thickness, hormonal and antioxidant enzymes level, and adverse events. Among these variables,

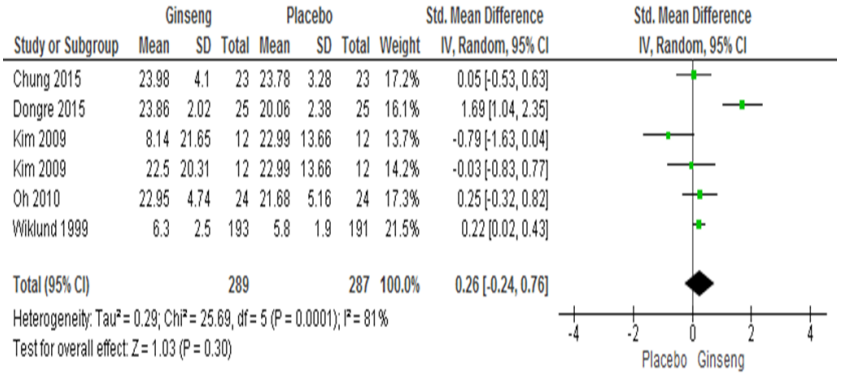

Figure. 4. Meta-Analysis of Ginseng Interventions for Improving Sexual Function.

sexual function was assessed only in two studies (52, 53). Since ginseng is identified as a natural antioxidant in lab and animal researches (54), several studies examined the antioxidant effects of different types of ginseng on human or animals. However, based on the present systematic search, all the studies compared ginseng with placebo but none of them compared ginseng with other antioxidants (55-58). To the best knowledge of the researchers, most of the trials were conducted on men's sexual and erectile dysfunction (41-43). Other RCTs used a combination of ginseng with other herbs, minerals, and vitamins to evaluate sexuality in other stages of a women's life (46,59). Besides, some other trials were conducted on cancer survivors (60), the results of which cannot be expanded in the present systematic review.

Another comprehensive systematic review was conducted on randomized clinical trials that considered the beneficial effects of Panax ginseng on different medical conditions or on healthy participants. In addition, the related articles that met the inclusion criteria also examined physical and psychomotor performance, cardiovascular system, metabolism of glucose, respiratory system, menopausal symptoms, sexual function, immune system, life and mood quality, antioxidant effects, malignancy (anti-fatigue effects), and dry mouth. The results of the current review indicted considerable evidence for moderating glucose metabolism and promoting the immune system. Interpretation of other examinations was unreasonable due to restricted evidence (61). The result of a systematic review regarding the impact of ginseng on the quality of life showed a slight improvement in the quality of life in every included study. However, there was no conclusive evidence regarding the effect of supplemented ginseng and ginseng alone (36).

In addition to the above-mentioned studies, Jiae et al performed a systematic review of the Korean literature about the effect of ginseng on a broad range of medical conditions and healthy participants. The results confirmed the impact of ginseng on a variety of medical conditions. Nonetheless, the aim of this study was to facilitate access for other investigators (43). Overall, all the mentioned systematic reviews suggested further RCTs in order to obtain a definite conclusion.

Limitations of the Study

Although the researchers of this study tried their best to extract all the relevant RCTs, due to some restrictions especially the language constraint, they could not be sure that all the RCTs were included in this review study. Besides, it is worth mentioning that there were major sources of selective publishing and reporting bias and several RCTs remained unpublished with inconsistent and statistically insignificant results and thus lack of those resources may have changed the final result of this review.

In addition, it is worth noting that most RCTs on ginseng were conducted in Korea or sponsored by various pharmaceutical companies. In this review study, four RCTs were financially supported by Pharmaton (51), Ixoreal Biomed (45), Korea Ginseng Corporation (49) and KT and G (48). Such studies cannot be generalized to other countries and are potentially subject to bias.

Moreover, major constraints in this study are related to the methodological quality less than the optimal level and the non-compliance with the consolidated standards of reporting trials (CONSORT) guidelines in terms of randomization, blinding of the outcome assessor, and allocation concealment in some of the RCTs, which resulted in a moderate risk of bias in the present systematic review and all these issues might have had an effect on the conclusion of this systematic review.

Meanwhile, the trials which will be performed in the future should comply with the standards accepted for the trials methodology and CONSORT guidelines to minimize the risk of bias. In order to identify the adverse events and side effects of different types of ginseng especially long-term use and the optimal dosage and frequency of consumption, strict investigations on different types of ginseng should be conducted to evaluate its efficacy and safety for the common use of ginseng as a natural sexual enhancer in different countries.

Conclusions

Ultimately, the general meta-analysis did not confirm the ginseng role in improving the female sexual function and the evidence on ginseng as a therapeutic agent for women with sexual dysfunction is restricted. Therefore, drawing a definite conclusion can be unreasonable. As a result, similar studies focusing on the role of ginseng as a therapeutic agent in resolving the sexual dysfunction of the women are subject to further investigation.

Conflict of Interests

Authors declare that they have no conflict of interests.

Ethical Issues

Not applicable.

Financial Support

The authors received no specific source of funding for this work.

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