Systematic Review On The Use Of Maca (Lepidium Meyenii) In Sexual Dysfunction

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ABSTRACT

Introduction: Sexual health is defined as the complete state of physical, emotional and social well-being, related to sexuality. The Maca (Lepidium Meyenii), a product originating in the Central Andes of Peru (Juniín), resistant to hail, frost and prolonged droughts, which is located in high plateaus, mainly in the mountains of Peru, that is consumed in the food and beverage, by its nutritional content and for its antioxidant properties, anticancer and as a treatment in the sexual dysfunction. Among the chemical components of maca, are related to the therapeutic action in the improvement of the sexual health and fertility, are: the fitoestnoles, phytosterols, phytoestrogenes, polyphenols, alkaloids (lepilidinas A and B, macaridina), fatty acids (makaeno) and the amides (macamidas).

Objective: To evaluate the efficacy of Maca for treatment of sexual dysfunction in both men and women. Materials and methods: databases of PubMed / MEDLINE were consulted, and the Cochrane Controlled Trials Register, as well as additional resources such as Scielo seekers and Google Scholar. Randomized clinical trials studying the use of maca as a treatment for sexual health, comparative studies of treatment of sexual dysfunction and systematic reviews of the benefits of maca were identified. 20 studies were included, which have low risk of bias and high methodological quality. Results: The results demonstrate that Maca has high effectiveness in improving sexual function, increasing libido and improving erectile dysfunction; also helps reproductive health, increasing sperm count and sperm motility, enhances the anticancer action, favorable effects on menopause symptoms and improves inflammatory responses. Conclusions: Despite the effectiveness of maca use is limited by not providing a proper pharmacovigilance. Evidence has shown reduced sexual dysfunctions in men and women.

Keywords: Sexual Dysfunction, Maca, Men and women, Treatment, Efficiency.

Introduction

Sexual health is defined as the full state of well-being physical, emotional and social, related with the sexuality, by that, sexual health is not only the absence of disease, dysfunction or disability sexual, but a right of the human being that must be respected and protected. (World Health Organization, 2016) Maca (Lepidium Meyenii), a product originating in the Central Andes of Peru, resistant to hail, Frost, and prolonged droughts, which is located in the high plateaus, mainly in the mountains of Peru, (Junin). (Sifuentes, 2015) Maca is cultivated from the Inca time at altitudes ranging between 3800 to 4500 meters, which is consumed in foods and beverages, nutritional content are: proteins, sugars, starch, Glucosinolates, fatty acids, amino acids, microelements such as tantinos and saponins and essential minerals like iron and iodine. (Chauhan et al., 2014) The composition of dried powdered maca root, is composed of: 23.4% sucrose, 1.55% of glucose, 4.56% of oligosaccharides and 30.4% of polysaccharides (Dini et al., 1994; Valentova et al., 2006; Wang et al., 2007). There are 18 or 19 amino acids in maca root, emphasizing that 7 of them are essential, and its content is higher than in the potatoes and carrots. The content of unsaturated, such as linoleic and oleic fatty acids is of 52.7% to 60.3% of total fatty acids (Dini et al., 1994; Wang et al., 2007). The minerals found by 100 g of matter dry of maca include: calcium 247 mg, phosphorus 183 mg and iron 14.7 mg (Garcia et al., 2009).

Maca is consumed not only by their nutritional intake in the diet, but also for its antioxidant, anti-cancer properties, and as a treatment in sexual dysfunction, in both men and women (Ernst, Posadzki and Lee, 2011).

Sexual dysfunction is defined as any problem in the human sexual response (wish, excitation and orgasm) that usually prevent the development of full erection, affecting the integral health and self esteem of the individual, as well as couple relationship (Amssac.org, 2016).

The treatment of sexual dysfunction in men and women, including from drugs to complementary medicine (Sanchez-Borrego et al., 2014).

There are numerous studies on sexual dysfunction and the use of maca as an adjunctive treatment, as well, as the use of different treatments for sexual dysfunction, including herbs and drugs (Dording et al., 2015).

In recent years attempts have been made to the maca a value-added and many people in the world are opting for consumption since it is a toner and a powerful revitalizer (Hermann and Bernet, 2009).

The chemical constituents of maca, which are related to the therapeutic action in improving sexual health and fertility, include: the fitoestnoles, polyphenols, phytosterols, Phytoestrogens, alkaloids (lepilidinas A and B, macaridina),
fatty acids (makaeno) and amides (macamides). Gonzales, 2012.

This review provides an overview of Maca and its active molecules with demands for improvement in the sexual conduct within the complementary alternative medicine.

**Objective**

The aim of this systematic review was to assess the effectiveness of Maca as a treatment for sexual dysfunction, in both men and women.

**Materials and methods**

This systematic review of literature was reported in accordance with the guidelines described in the PRISMA statement and the Cochrane Handbook for systematic reviews of interventions driving, understood as "the meeting of empirical evidence that meets eligibility criteria previously established, in order to answer a specific research question" (Higgins JP, 2015).

**Search strategy**

The search was conducted in databases such as PubMed, Google Scholar, and Cochrane, from June 01 to July 15, 2016, for the development of sensitive and specific searches in the collection of clinical trials. In addition, this research included longitudinal descriptive studies, clinical trials randomised trials, systematic reviews and meta-analyses.

**Selection criteria**

Once completed, the review of the search studies were evaluated independently, the eligibility of all retrieved studies from compliance with the selection criteria, which were established in accordance with the study, design and application of study, participants, intervention, measurement results, and comparisons, (See table 1).

The process of search and selection of the articles featured stages that allowed authors to select the 20 articles of the present review, where identification of 60 studies were exclusively found in databases of which 10 were duplicated scientific texts.

For the second stage, when the screening was conducted in title and summary, a total of 25 were dispensed for failing to meet the criteria for selection proposed (table 1.)

In the third stage of eligibility compliance fully of the selection criteria from the reading of the full text is sought: again excluded 5 items, setting up the fourth and last stage of inclusion, 20 scientific articles with which this study is being conducted.

**Table 1: Criteria for selection**

<table>
<thead>
<tr>
<th>Design</th>
<th>Systematic Reviews and trials controlled randomized.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participating</td>
<td>Adult Men and women and older adults with sexual dysfunction (20-64 years).</td>
</tr>
<tr>
<td>Intervention</td>
<td>The use of maca in participants with sexual dysfunction.</td>
</tr>
<tr>
<td>Results measurement</td>
<td>Analysis of clinical studies</td>
</tr>
<tr>
<td></td>
<td>Software Chi-square statistics.</td>
</tr>
<tr>
<td></td>
<td>International index of erectile 5 function (IIEF - 5).</td>
</tr>
<tr>
<td>Comparisons</td>
<td>Conventional treatment with herbal aphrodisiacs.</td>
</tr>
</tbody>
</table>

Source: Dr. Alexander Ojeda Crespo (2016)

**Inclusion and Exclusion criteria**

In the realization of this systematic review, the following inclusion criteria were used: design: systematic reviews and trials randomised; Participants: Adult Men and women and older adults with sexual dysfunction (20-64 years); Intervention: the use the maca in participate with sexual dysfunction; Results measurement: analysis of clinical studies, software Chi-square statistic. International index of erectile function-5 (IIEF - 5); and comparisons: conventional treatment with herbal aphrodisiacs.

Exclusion criteria have: men and women younger than 20 years old, and adults and seniors without sexual dysfunction. Studies that do not meet the criteria described in table 1.

**Ethical considerations**

This study follow the provisions established in the Declaration of Helsinki and approved by the respective committees on ethics, in which the patient signed the consent form. (Figure 1.)

**Data extraction**

In this paragraph, 3 authors were in form independently of the process of extraction of data. The data extracted are: authors, year of publication, study design, characteristics of the interventions, age of the patients. However, the authors considered as a limitation of the study under 20 years and discrimination studies on animals.
Results

Characteristics of included studies

Of 20 items, provided valid estimates for the model of meta-analysis, the evaluation was conducted in 3 clinical studies and 17 systematic reviews. The average publication year was 2014. Most of the studies were carried out in Asia and America (Table 2).

Results of the studies

The trials were: double-blind, randomized; in a study of Asian origin on the effects of *Lepidium Meyenii Walp* in the semen and hormone levels in serum from blood in healthy older men involved, 20 volunteers aged 20-40 years were study for 6 to 12 weeks of which 2 men were diagnosed with oligozoospermia during the study. Therefore, they were not included in the trial.

Of the 18 remaining volunteers, 7 consumed 11 maca and placebo, this active management of gelatinized maca given in powder form (gelatin capsules enterosolvent 350 mg of maca in each capsule) with a dose of 5 capsules per day which is equivalent to 3 grams daily increase was observed as the final result after 12 weeks of treatment a statistically significant concentration of spermatozoa in 55% and 84% motile sperm count (Cheorl-Ho Kim 2016). In the study of the safety and efficacy of dietary supplements in Japan, were given six tablets containing 200 mg of Ginseng extract of Meyer, 250 mg *L. meyenii* (maca), 250 mg of extract yeast (0.2% of polyamine) root, extract 250 mg of egg white pepti de, M. pruniens extract 150 mg, 150 mg ginger extract black 125 mg of polyphenols (VInitrox), 50 mg of L-arginine, 50 mg L-carnitine fumarate, 30 mg Coenzyme Q10, 10 mg Datocoferyl, 10 mg of black pepper extract, and 2.5 mg of zinc. With placebo containing functional foods were two trials, where in the first study of 15 participants with consent informed, with the supplement diet and the second study of 14 participants (randomized, double placebo (blind) of 8 weeks found that the level of testosterone free in serum and the testosterone total level did not change in any of the groups during the study.

It was determined that thanks to supplement dietary aphrodisiac, showed an improvement in the IIEF-5 (international index of erectile function 5) and a higher level of serum free testosterone after 8 weeks of the intervention (Kamohara, 2014). The concentration of Sera IL-6 levels increased during exposure to the heights, according to the analysis of the article the role of maca (*Lepidium meyenii*) consumption of serum Interleukin-6 levels and health status of the populations living in the Peruvian Andes for more than 4000 m above sea level. Sera Il-6 levels were below the range expected in inflammatory diseases. If the levels of IL-6 also increase in the populations of height, then this could affect health status. Inflammatory marker Interleukin-6 (IL-6) is a strong predictor of the emergence of health-related events (Gonzales et al, 2014).

These nutritional supplements can delay age-related diseases, maca is the optimal treatment of patients with late-onset Hypogonadism, there is overwhelming evidence that testosterone replacement therapy has many beneficial effects and increases longevity (Comhaire, 2015).

induced sexual dysfunction. Arizona scale (ASEX) sexual experience and the General Hospital of Massachusetts questionnaire of sexual function (MGH-SFQ) were used to measure sexual dysfunction. The subjects on 3.0 g / day maca had a significant improvement in ASEX and MGH-SFQ scores, but subject to 1.5 g / day maca did not (Gonzalez, 2013).

Adverse effects

In the Ethnobiology and Ethnopharmacology of *Lepidium meyenii* (Maca), a plant of the Peruvian Sierra, no adverse effects were found in the volunteers using the Silymarin (0.8 g / day), Silymarin + yacon (0.8 + 2.4 g / day), and Silymarin + maca (0.6 + 0.2 g / day).

<table>
<thead>
<tr>
<th>Database</th>
<th>Design</th>
<th>Study</th>
<th>Participants (n)</th>
<th>Intervention</th>
<th>Measurement of Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pubmed (2015)</td>
<td>Randomized clinical trial</td>
<td>Maca as a treatment for sexual dysfunction induced by antidepressants in women.</td>
<td>Experimental group: 55 years (41.5 + 12.5)</td>
<td>They conducted the study in 45 patients external female with dysfunction induced by ISRZ. 45 of 57 women were assigned to the random 42: (30 premenopausal and 12 postmenopausal women)</td>
<td>Scale of Arizona sexual experience (ASEX) and the questionnaire of sexual function of the Massachusetts General Hospital (MGH-SFQ)</td>
</tr>
<tr>
<td>Cochrane</td>
<td>Two clinical studies Randomized Placebo, double-blind.</td>
<td>The safety and efficacy of a dietary supplement that contains ingredients for functional foods for erectile dysfunction.</td>
<td>Two clinical studies average age of 44.5 years (35 +/- 1.9) (43.9 +/- 5.5)</td>
<td>The first: 15 participants informed with diet of herbal supplements and the second study consent: 14 participants (randomized, double blind placebo).</td>
<td>Level of testosterone free in serum and the testosterone total not changed in any of those groups. It showed that thanks to the supplement dietary aphrodisiac showed an improvement in the IIEF-5 (international index of function erectile 5).</td>
</tr>
<tr>
<td>Cochrane</td>
<td>Systematic comparative review between animals and man.</td>
<td>Maca: Botany of Andes</td>
<td>41 articles.</td>
<td>Study of maca, in the mountains of the Peru, studied its components, properties and analysis of These animals and men.</td>
<td>In men, it enhances the production of semen, and women maca reduces psychological, such as anxiety and depression symptoms dysfunction independent of estrogenic and androgenic activity postmenopausal women.</td>
</tr>
<tr>
<td>Cochrane</td>
<td>Systematic review of comparison with other aphrodisiac herbal maca.</td>
<td>Natural aphrodisiacs: a review of selected sexual enhancers.</td>
<td>50 articles: clinical cases and clinical studies of maca and other herbal randomized control.</td>
<td>To what sexual dysfunction were selected, mechanism of action, support data for use both maca and ginkgo, ginseng, tribulus, arginmax, and zestra was analyzed.</td>
<td>Maca benefits to patients as well as selective inhibitors of the reuptake of serotonin, SSRIS; related with low libido and erectile dysfunction, and low libido in women at the menopausal stage.</td>
</tr>
</tbody>
</table>
Table 2: Characteristics of the studies included in the meta-analysis and systematic magazine

<table>
<thead>
<tr>
<th>Database</th>
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<th>Database</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pubmed</td>
<td>Systematic use shape review of sexual herbal including the maca.</td>
<td>The drug surveillance supplements herbal sexual enhancers.</td>
<td>Study of application and monitoring worldwide of herbal maca.</td>
</tr>
<tr>
<td>Cochrane</td>
<td>Systematic review: assessment multilingual full.</td>
<td>Products sexual of the enhancement to the sale in line: how generate awareness of the effects psychoactive of yohimbine, Maca, Horny Goat Weed, and Ginkgo biloba.</td>
<td>Maca compounds known as MTCA (3S-1-methyl-1, 2, 3,4-tetrahidro-beta-carbolina-3-carboxilico) have been suggested to be associated with the behavior, sexual desire, which is common in addictions. Adverse effects were found.</td>
</tr>
<tr>
<td>Pubmed</td>
<td>Review systematic</td>
<td>Spanish consensus on sexual health in men and women older than 50 years.</td>
<td>Analysis of the factors that influence sexual health of men and women over the age of 50 in 47 articles.</td>
</tr>
<tr>
<td>Pubmed</td>
<td>Review systematic</td>
<td>The contribution of andrologistas to a better life for the men of advanced age: part 2.</td>
<td>These supplements nutrition can delay the diseases related with the age. Containing additives that give health and which has medicinal benefits.</td>
</tr>
<tr>
<td>Pubmed</td>
<td>Cross-sectional observational study</td>
<td>Role of the consumed maca (Lepidium meyenii) on serum levels of Interleukin-6 and State of health of the populations living in the Central Andes of the Peru more than 4000 m above sea level.</td>
<td>The maca to the reduce the IL. 6 improves erectile dysfunction in men.</td>
</tr>
</tbody>
</table>

Source: Dr. Alexander Ojeda Crespo (2016).
The study of the safety and efficacy of dietary supplements in clinical studies was not reported adverse events in either group at doses of 250 mg of *L. Meyenii* (Kamohara, 2014).

However, in systematic reviews we must stress that these adverse effects that were presented were minimal in relation to other treatments applied.

In a systematic study "products of sexual enhancement for the sale in line: awareness of the psychoactive effects of the yohimbine, the maca, epimedium, and Ginkgo biloba" reported adverse effect is less than the 1% and these were: alteration of the menstrual cycle (modifications of length, anovulatory cycles), painful intestinal cramps, severe gastritis, the increase of blood pressure, changes of humor, increase of heart frequency, insomnia, Depression / anxiety, symptoms of premenstrual syndrome. (Corazza, 2014).

**Discussion**

Of the 20 articles studied, two articles reported the occurrence of adverse effects and the induction of psychological symptoms, such as changes of humor, anxiety and hallucinations, as well as addictive behaviors, these minor symptoms might be induced by other pharmacological treatment.

In relation to erectile dysfunction, maca has the same effect as the SSRIS serotonin reuptake inhibitors.

Concerning low libido in women of menopausal stage, the maca helps to improve it, due to the phytosterols and Phytoestrogens it has (West *et al.*, 2015).

The randomized clinical trials showed that there are beneficial effects of maca on symptoms of menopause, healthy perimenopause, after early menopause, and final postmenopausal women.

The Maca reduces the psychological symptoms, as well as anxiety and depression, and reduces measures of sexual dysfunction in postmenopausal women independent of the activity estrogenic and androgenic. (Rosales *et al.*, 2015).

It showed that maca improves uniquely hormone luteinizing (HL) and serum levels of pituitary hormones.

The results obtained showed the efficiency of the maca in the sexual dysfunctions, as well as helped to the increase sperm count and their motility.

**Conclusion**

Study has shown the use of Maca (*Lepidium meyenii*) to reduce sexual dysfunction, regardless of the levels of hormones and antidepressants. However, the evidence with respect to the use of the Maca, is very limited but effective. (Sanchez-Borrogo, 2014). Since it gains not only for its benefits in sexual function but also for other diseases and disorders. Being a very energizing plant with nutritional components rich in vitamins, minerals etc. It has also been recommended for women with different hormonal disorders since it acts as a powerful endocrine regulator. The maca is an important food product food that is presented in different sizes and colors, each color representing its composition, which are manganese, calcium, zinc, potassium etc.

Then, within the natural products most widely used in the population, maca is leading the ranking of greatest demand for natural medicine that is marketed abroad, due to its high effectiveness for erectile dysfunction followed by ginkgo biloba, yohimbine, and giseng.

**Recommendations**

The use of maca should have a pharmacovigilance in international health statutes, also recommended its application in diabetic people with sexual dysfunction as it has a desinflamatory feature that help improve chronic diseases. It is recommended to take into account the protocols of treatment to women in menopause, the use of maca, as adjunctive therapy to the symptoms associated with this stage of life.

**Ethical responsibilities**

Protection of people and animals. The authors state that this research experiments was not performed in humans or animals.

**Confidentiality of the data**

The authors state that patient data do not appear in this article.

**Right to privacy and informed consent**

The authors state that patient data do not appear in this article.

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**Conflict of interest**

The authors declare not to have any conflict of interest.

**References**


