

DOI: <https://doi.org/10.36489/saudecoletiva.2021v11i61p4968-4977>

# Evidences of Electroacupuncture Treatment in Women with Stress Urinary Incontinence: an integrative review

Evidencia del Tratamiento con Electroacupuntura en Mujeres con Incontinencia Urinaria de Esfuerzo: una revisión integrativa  
Evidências do Tratamento de Eletroacupuntura em Mulheres com Incontinência Urinária de Esforço: Uma revisão integrativa

## ABSTRACT

**Objective:** To analyze the evidence of treatment with electroacupuncture in women with stress urinary incontinence. **Methods:** Integrative bibliographic review using scientific articles indexed in the MEDLINE, LILACS, SciELO and PUBMED databases through the descriptors: "eletoacupuncture" and "stress urinary incontinence" in the Health Sciences Descriptors and the Boolean operator AND. The articles obtained were those published between 2009 and 2019. The study was carried out from May to June 2019. **Results:** A complete of 20 articles were found in the databases, leaving 5 articles for full reading, including only 3 that were related direct with the theme. It was found that the treatment of urinary incontinence with electroacupuncture seems to be valid, especially in cases with less urine loss. However, with few studies, an acupuncture point protocol as well as electroacupuncture parameters is not well defined.

**DESCRIPTORS:** Eletroacupuntura; Stress Urinary Incontinence.

## RESUMEN

**Objetivo:** Analizar la evidencia del tratamiento con electroacupuntura en mujeres con incontinencia urinaria de esfuerzo. **Métodos:** Revisión bibliográfica integrativa utilizando artículos científicos indexados en las bases de datos MEDLINE, LILACS, SciELO y PUBMED a través de los descriptores: "electroacupuntura" e "incontinencia urinaria de esfuerzo" en los Descriptores de Ciencias de la Salud y el operador booleano AND. Los artículos obtenidos fueron los publicados entre 2009 y 2019. El estudio se realizó de mayo a junio de 2019. **Resultados:** Se encontraron un total de 20 artículos en las bases de datos, quedando 5 artículos para lectura completa, incluyendo solo 3 que estaban relacionados directo con el tema. Se encontró que el tratamiento de la incontinencia urinaria con electroacupuntura parece ser válido, especialmente en los casos con menor pérdida de orina. Sin embargo, con pocos estudios, un protocolo de puntos de acupuntura y los parámetros de electroacupuntura no están bien definidos.

**DESCRIPTORES:** Electroacupuntura; Incontinencia Urinaria de Esfuerzo.

## RESUMO

**Objetivo:** Analisar as evidências do tratamento com eletroacupuntura em mulheres com incontinência urinária de esforço. **Métodos:** Revisão bibliográfica integrativa utilizando artigos científicos indexados nas bases de dados MEDLINE, LILACS, SciELO e PUBMED através dos descritores: "eletoacupuncture" e "stress urinary incontinence" constantes nos Descritores em Ciências da Saúde e o operador booleano AND. Os artigos obtidos foram os publicados entre 2009 e 2019. O estudo foi executado de maio a junho de 2019. **Resultados:** Foram encontrados 20 artigos no total nas bases de dados, restando 5 artigos para leitura na íntegra, sendo incluídos somente 3 que tinham relação direta com o tema. Constatou-se que o tratamento da incontinência urinária com a eletroacupuntura parece ser válido, principalmente nos casos mais leves, com menores quantidades de perdas da urina. Entretanto, devido poucos estudos, ainda não está bem definido um protocolo dos pontos de acupuntura assim como dos parâmetros da eletroacupuntura.

**DESCRITORES:** Eletroacupuntura; Incontinência Urinária por Estresse.

RECEIVED ON: 10/01/2020 APPROVED ON: 12/10/2020

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**INTRODUCTION**

Urinary incontinence (UI) is the involuntary loss of urine that has a direct impact on people's quality of life. Its prevalence has great variability, but generally pointing to women as the most affected population. Among the main factors that can influence this loss are pregnancy, age, obesity and gynecological surgeries.<sup>1</sup> To define the type of urinary incontinence, much depends on the patient's clinical evaluation, the symptoms and complaints presented and in some cases the urodynamic exam.<sup>2</sup>

Stress urinary incontinence (SUI) is one of the types of UI, being determined as the complaint by any involuntary loss of urine that occurs due to physical effort, such as coughing or sneezing, by an increase in intra-abdominal pressure and incompetence of the pelvic diaphragm muscles.<sup>2</sup>

Acupuncture is an ancient technique based on Traditional Chinese Medicine (TCM) that uses needles at points on the surface of the body that make it possible to regulate organic functions. In this view, SUI would be mainly the result of a deficiency of kidney Qi that could affect bladder dysfunction in controlling urination.<sup>3</sup> Maciocia<sup>4</sup> defined Qi as the energy that presents itself on both the physical and the spiritual level. Something that can be both material and

immaterial at the same time and manifest in the most rarefied to dense forms.

Electroacupuncture is a technique within the practice of acupuncture that uses electrical stimuli to move the needles, replacing the therapist's manual stimuli and allowing to describe the electro stimuli that will be used in the needles.<sup>5</sup> The aim of this study was to develop an integrative review to understand what the current scientific evidence is using electroacupuncture in the treatment of women with stress urinary incontinence (SUI).

**METHOD**

This is an integrative literature review study, which is a research method that allows the search, critical evaluation and synthesis of the evidences of the investigated topic, with its product being the current state of knowledge of the investigated topic<sup>6</sup> thus allowing the capacity for systematization of scientific knowledge for the researcher to have an approximation of the theme he wishes to study.<sup>7</sup> For the elaboration of this study, six distinct steps were followed, namely: 1) Identification of the theme and selection of the hypothesis or guiding question; 2) determination of criteria for inclusion and exclusion of studies; 3) categorization of studies; 4) evaluation of the studies included in the review; 5) interpretation of results and 6) synthesis/presentation of knowledge.<sup>6</sup>

To identify the research question, the PICO strategy was used.<sup>8</sup> It is a tool that keeps the focus on research and is used to formulate the question, in which "P" (population or problem) referring to women with stress urinary incontinence; "I" (intervention) to electroacupuncture; "C" (comparison) does not apply and "O" (expected outcome) improvement of incontinence symptoms.

Therefore, to answer the review question: "What is the evidence for treating stress urinary incontinence using electroacupuncture addressed in articles published in journals in the past 10 years?" The survey of scientific publications was carried out using descriptors in databases and virtual libraries. The search period took place from May to June 2019. The following electronic databases were consulted: Virtual health library (VHL) in the databases of Latin American and Caribbean Literature in Health Sciences (LILACS) and International Literature in Health Sciences (MEDLINE); Scientific Electronic Library on Line (SciELO) and the US National Library of Medicine/National Institutes of Health (PubMed). The following descriptors were used in Portuguese and English: "Electroacupuncture", "Urinary Incontinence due to rubbing", "Electroacupuncture", "Stress Urinary Incontinence" in the Health Sciences Descriptors (DeCs) and the Boolean operator AND.

The following article inclusion criteria were adopted: full texts with abstracts available in Portuguese and English, studies carried out on humans classified as clinical trials, controlled and randomized clinical trials, classic articles, case reports and observational studies. The following publications were excluded from the analysis: Editorials, point of view or reflection, literature review articles, dissertations and theses. The articles that appeared in more than one database, only one was used to be analyzed. The steps

of this review are summarized and presented in the form of a flowchart in figure 1, using the PRISMA<sup>®</sup> model.

## RESULTS

Twenty articles were found in the databases. After reading the titles and abstracts and applying the inclusion and exclusion criteria, it resulted in 5 articles. Then, after reading in full, a total of 3 articles were obtained to carry out the bibliographic basis.

The articles were published between the years 2016 to 2019, all made in China and written in English. An observed preliminary result is certainly the scarcity of publications investigating electroacupuncture therapy in the treatment of SUL.

Specifications of methodological quality, sample, intervention and summary of the results of the three articles<sup>9,10,11</sup> are summarized in table 1. All study participants were seen on an outpatient basis and separated into a group of electroacupuncture (EA) or false electroacupuncture, known as sham electroacupuncture (SEA).<sup>9,10</sup> SA is the methodological way that many clinical trials use to establish the control group. They choose points outside the acupuncture meridians and to ensure masking, they use placebo needles that are similar to conventional needles, but made with a system that prevents them from penetrating the skin.<sup>12</sup> In the SEA groups of the two clinical trials found, placebo needles were used, associated with false acupoints and the cables that would conduct the electrical stimuli were broken.

The points selected on the bladder meridian, the B33 and B35, were selected for their indications based on the TCM theory and for the location of the innervation of the urinary system in Western medicine.<sup>9,10</sup> In both studies, the AE and SEA groups performed manipulations on the needles after

Figure 1. Flowchart explaining the selection of articles. Rio de Janeiro / RJ, 2020.

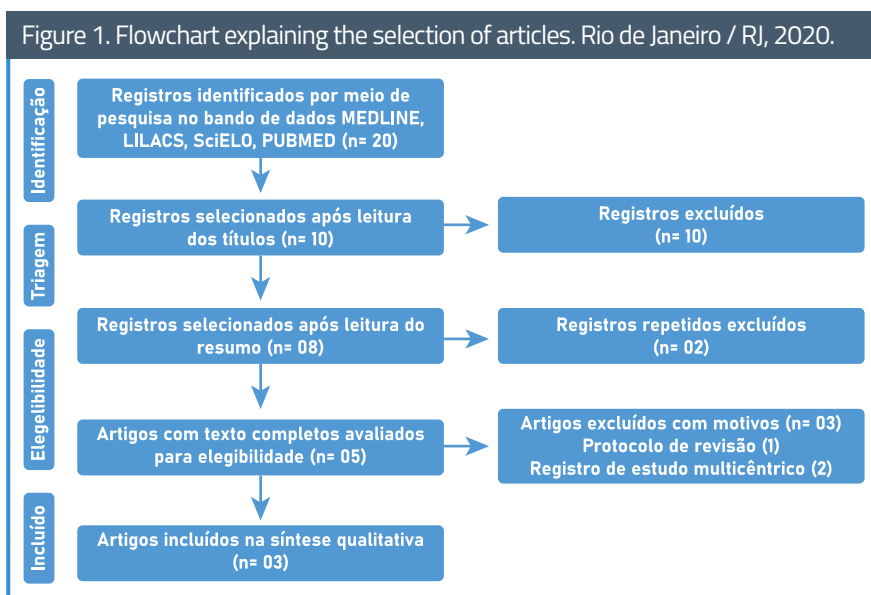


Table 1. Characteristics of the studies included in the integrative review, Rio de Janeiro / RJ, 2020

Estudo	Ano	Tipo e Estudo	Amostra	Intervenção	Resultado
Xu H et al. <sup>9</sup>	2016	Piloto, ensaio clínico randomizado, placebo, controlado, cego para participante	80 mulheres idade 40-75 anos	18 sessões, 30 min cada, 6 semanas de tratament, 3x por semana. Follow up de 24 semanas. Grupo EA usou pontos B33 e B34. Grupo SA, uso de agulhas placebo distante 20mm dos pontos B33 e B34. Parâmetros de EA 50Hz, 1-5mA. Mesmo protocolo de intervenção de Huafang Xu et al.	Redução do volume de perda de urina, grupo EA no pad-test 1h (p=0.01). Redução dos episódios de perda de urina do DM no grupo EA (p<0,05) diferença significativa entre grupo na 24 <sup>o</sup> semana do follow up, ICIQ-SF diferença significativa entre EA e SA (p<0,05). Diferença estatística entre os grupos (p<0,01) no pas test 1h. Grupo AE perda menor de volume de urina. No DM diferença estatística entre os grupos (p<0,01) no follow up ICIQ-SF diferença estatística entre os grupos (p<0,01) na 6 <sup>o</sup> semana de tratamento e no follow up Mulheres no grupo EA tiveram menos perda de volume urina no pad test 1h entre 2 <sup>o</sup> e 6 <sup>o</sup> semana de tratamento em comparação ao grupo SA (p<0,01). Responderam melhor ao tratamento de EA e SA as mulheres que usavam menos absorventes por semana
Liu Z et al. <sup>10</sup>	2017	Ensaio Clínico, multicêntrico, randomizado, cego para participante	504 mulheres idade 40-75 anos	Análise pós-hoc e análise de regressão logística com os dados do estudo de Zhishun Liu et al.	
Jiao R et al. <sup>11</sup>	2019	Estudo de Coorte Observacional	349 mulhes na pós menopa		

the true or false insertions with the intention of obtaining the sensation of De Qi, defined as a set of sensations that can be described by the patient (such as pain, numbness, weight or other local sensations) at the manipulation of the needle.<sup>10</sup>

## DISCUSSION

After reading the articles, an analysis was carried out, which was divided into categories for a better evaluation of the results found. In this division, it was possible to observe the following subjects: Evaluation of the symptoms of urine loss before and after treatment with electroacupuncture using the 1h pad test, analysis of the 72-hour Urinary Diary, evaluation of the quality of life with the ICIQ-SF questionnaire, the selected acupoints and the electroacupuncture parameters.

Evaluation of the pad test 1h: The pad test is an easy to apply, objective and valid test for quantifying the volume of urine loss. It consists of using an absorbent (pad) for a time of 1 hour previously weighed and placing it close to the external urethral meatus.<sup>13</sup> After that time, he will be weighed and checked if his weight has increased due to the loss of urine. In the two clinical trials<sup>9,10</sup> it was found that the AE groups compared to the SEA groups obtained a greater reduction in urine loss.

The study by Jiao et al.<sup>11</sup> also found a similar result. However, the participants who had higher amounts of losses did not improve with the treatment of AS. Thus, it can be assumed that AS would be a complementary option to other conventional treatments, such as training the pelvic floor muscles (TPFM).

Analysis of the 72-hour Urinary Diary: The Urinary Diary is an instrument used to assess the urinary habits of people with symptoms of urinary incontinence (UI).<sup>14</sup> In the results found, the AE groups showed greater reductions in UI episodes, especially at the end of the follow-up. A possible explanation made by the authors would be the long-term and cumulative effect of AE.<sup>9,10</sup> Paik et al.<sup>15</sup> observed that in some cases acupuncture improved the symptoms of urinary incontinence. However, in the analysis they

did not discriminate the type of UI (effort or mixed, for example) and concluded that there would not be enough evidence to explain the action of acupuncture in this improvement. The study by Bergström et al.<sup>16</sup> investigated the use of acupuncture in elderly women with urgent and mixed UI. The authors' explanation for the improvement of symptoms was probably due to the physiological mechanisms of the application of acupuncture, which increased the amount of  $\beta$ -endophones in the CNS and would have inhibited the pontine urination center, causing an increase in the bladder reserve during the filling phase.

**Despite recognizing the importance of pelvic floor muscle (PFM) integrity for maintaining continence mechanisms during efforts, the need for a functional and intact neuromuscular system must also be highlighted.**

Despite recognizing the importance of pelvic floor muscle (PFM) integrity for maintaining continence mechanisms during efforts, the need for a functional and intact neuromuscular system must also be highlighted. Yang et al.<sup>17</sup> showed with ultrasound, how the reflex activity of PFM is important to maintain continence by increasing intra-urethral pressure. However, the authors explained that the literature is still scarce in being able to explain how this reflex would work.

Quality of life ICIQ-SF: The ICIQ-SF is a self-administered questionnaire, specific to assess the impact of UI on patients' quality of life.<sup>18</sup> In both clinical trials, the AE group showed a reduction in the ICIQ-SF score showing less impact of UI on quality of life. This result was significant during treatment and maintained at follow-up. The study by Jiao et al.<sup>11</sup>, however, he found no differences using the ICIQ-SF. From the above, there is evidence of an improvement in the quality of life with the treatment of AS in SUI and this response is fundamental due to the negative effects of UI in the psychological, physical, social, sexual and occupational spheres.<sup>19</sup>

Acupoints and Electroacupuncture Parameters: The selected acupoints were B33 and B35. The authors<sup>9,10</sup> explained that the choice of the two acupoints was due to SUI being related to bladder dysfunction by TCM and for being located in the lumbosacral region. The location is proximally on the posterior branch of S3, corresponding to the location of the pudendal nerve that originates in the S2-S4 segments of the medulla and controls the external sphincter of the urethra and the pelvic floor muscles.<sup>20</sup> Other studies have evaluated more acupoints in the sacral region such as B31, B32 and B33<sup>16</sup> or points in the ventral pelvic region such as points CV3, CV4 and CV6.<sup>15</sup> In another more recent study, Liu et al.<sup>21</sup> selected the same points B33 and B35 for the treatment of patients with mixed UI. Therefore, it seems a tendency to choose points of the bladder meridian close to the emergence of the pudendal nerve. However, it is not yet known whether other points of the Bladder or even the Kidney meridian, coupled from the Bladder according to the TCM and with the

function of governing the water element 4 would have an effect on the treatment of SUI. Regarding the parameters of AE, studies<sup>9,10</sup>, used the 50Hz frequency parameters, with continuous wave, current intensity of 1-5mA and 30 minutes of treatment. It was understood that the pulses used were probably of the “non-polarized” type as they did not describe the location of the poles. The frequency of 50 Hz for energy acupuncture is considered high, as it is in the range of

50 to 2500 Hz.<sup>5</sup> The studies did not explain the reason for the frequency chosen and thus it is not possible to say what was the criterion for this choice. Perhaps, the option for the frequency of 50Hz was with the intention of electrically stimulating causing a depolarization of the nerve end, similar as it is used in the treatment of Pelvic Physiotherapy, to reinforce the muscular work of the pelvic floor.<sup>22</sup> Thus, it would still not be possible to establish at that moment which would be

the best most effective parameters for electroacupuncture therapy in SUI.

## CONCLUSION

Despite the few published works, it seems that there is a tendency to improve symptoms of SUI using electroacupuncture. The results so far have shown a significant improvement in symptoms that deserve further investigation. ■

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