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ELETRODIAGNOSTIC AND ENERGY PROFILE WITH RYODORAKU IN CHINESE TRADITIONAL MEDICINE: INTEGRATIVE REVIEW

Eletrodiagnóstico e perfil energético com o ryodoraku em medicina tradicional chinesa: revisão integrativa

Eletrodiagnóstico y perfil energético con el ryodoraku en medicina tradicional china: revisión integrativa

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ABSTRACT

Objective: To synthesize the evidence in the literature on the applicability of the Ryodoraku system in the energy diagnosis based on the precepts of Traditional Chinese Medicine. **Method:** integrative review, carried out by independent reviewers in databases. **Results:** we found 324 studies. After exclusion, eight were analyzed, with a predominance of descriptive studies. There was agreement about the 24 points selected for the application of Ryodoraku; however, there is disagreement as to their location. **Conclusions:** Ryodoraku still does not present consistent evidence on its use, limiting the evaluation of its applicability.

Descriptors: Diagnosis, Electric condutivity, Skin, Acupuncture, Medicine chinese traditional.

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RESUMO

Objetivo: Sintetizar as evidências disponíveis na literatura sobre a aplicabilidade do sistema Ryodoraku no diagnóstico energético baseado nos preceitos da Medicina Tradicional Chinesa. **Método:** revisão integrativa, realizada por revisores independentes em bases de dados. **Resultados:** encontrou-se 324 estudos. Após exclusões, oito foram analisados, com predomínio de estudos descritivos. Houve concordância acerca dos 24 pontos selecionados para a aplicação do Ryodoraku; entretanto, há divergência quanto à localização dos mesmos. **Conclusões:** o Ryodoraku ainda não apresenta evidências consistentes sobre sua utilização, limitando a avaliação de sua aplicabilidade.

Descritores: Diagnóstico, Condutividade elétrica, Pele, Acupuntura,Medicina tradicional chinesa.

RESUMEN

Objetivo: Sintetizar las evidencias de la literatura sobre la aplicabilidad del sistema Ryodoraku en el diagnóstico energético basado en los preceptos de la Medicina Tradicional China. **Método:** revisión integrativa, realizada por revisores independientes en bases de datos. **Resultados:** se han encontrado 324 estudios. Después de exclusiones, ocho fueron analizados, con predominio de estudios descriptivos. Hubo concordancia sobre los 24 puntos seleccionados para la aplicación del Ryodoraku; sin embargo, hay divergencia en cuanto a la localización de los mismos. **Conclusión:** el Ryodoraku todavía no presenta evidencias consistentes sobre su utilización, limitando la evaluación de su aplicabilidad.

Descriptores: Diagnóstico, Condutividad eléctrica, Piel, Acupuntura, Medicina china tradicional.

INTRODUCTION

In Traditional Chinese Medicine (TCM), different methods have been employed to make the energy diagnosis of individuals. This is a conclusion about pathological conditions that determine unbalanced energy syndromes or patterns (Zheng) being manifested by each individual and should be reviewed at each time of treatment.[1-2]

TCM parameter diagnostics can be performed using the eight-principle (Ba Gan) or five-element standards according to Qi (energy), Xue (blood) and Jin Ye (body fluids), internal Zang Fu systems. (organs and viscera), among others.[3]

In this context, the Japanese physician Yoshio Nakatani, in the 1950s, created a method of electrical stimulation that measures the energy imbalance from acupuncture points for the purpose of diagnosis and treatment called the Ryodoraku system.[4]

The Ryodoraku (ryo = good, do = electro conductive and raku = line) or ryodoten (electropermeable point) method aims to measure the integumentary electrical resistance for diagnostic purposes and, later, harmonization and balance of organs and viscera by stimulation or inhibition of specific acupoints. These measured values of the flow of electric current generated are transferred to a logarithmic graph on which a Gauss curve, interpreted in the diagnosis in terms of energy, is produced.[4]

The mechanism of measurement of energy variations in the meridians, measured by the device, is explained by stimulation in the body that generates excitement. It travels the sensory nerve fiber through the skin until it reaches the sensory center, which transmits stimulation by afferent motor and neurovegetative nerves responsible for their distribution throughout the body.[4-5]

Studies have employed the system in order to diagnose and treat energy imbalances in individuals. It was used to assess environmental issues such as the impact of noise on the physiological response of individuals,[6] to assess sensory perception such as pain,[7] to assess the energy of meridians in coffee drinkers,[8] to reduce weight in morbidly obese[9] and in the physical fitness assessment of athletes.[10]

Specifically about the diagnosis by measuring the energy profile, there is a limitation of publications that prove the applicability of the Ryodoraku method. The aim of this study was therefore to synthesize the evidence available in the literature on the applicability of the Ryodoraku system in the energy diagnosis based on TCM precepts.

METHODS

Integrative literature review conducted from five stages: elaboration of the research question, search of primary studies in the literature, evaluation, data analysis and presentation of the review.[11]

The guiding research question of the study, based on the PICO strategy,[12] was "What evidence is available in the literature about the use of the Ryodoraku system in the delimitation of the energy profile in light of Traditional Chinese Medicine (TCM)?".

The search for the articles was done by two independent reviewers, in April 2019, in the databases: Medline via PUBMED, Web of Science, The Cumulative Index to Nursing and Allied Health Literature (CINAHL), Physiotherapy Evidence Database (PEDro), Embase, Scopus , China National Knowledge Infrastructure (CNKI), Chinese Biomedical Literature Database (CBMdisc), and Virtual Health Libraries (VHL) and Traditional, Complementary and Integrative Medicines (VHL-MTCI). Reference lists from other investigations were also explored in search of relevant studies related to the guiding question.

The free term "Ryodoraku" was used to search the primary studies, since no controlled terms related to the theme were identified, and to broaden the search strategy.

The selection criteria were primary studies that addressed the use of the Ryodoraku system to determine the energy profile according to TCM, published in English, Portuguese and Spanish. Studies that did not present an online abstract in full for analysis, those that were not localized (online, via bibliographic commutation - COMUT or direct contact with the authors), gray literature

(books and monographs) and event annals summary were excluded.

Data from the studies were extracted using a form elaborated by the researchers, containing: title; author (s) / area of training; periodic; year of publication; country / language of study; goals; methodological characteristics (design, sample size; clinical condition involved, specification of Ryodoraku application, energetic diagnosis); main results; and conclusions.

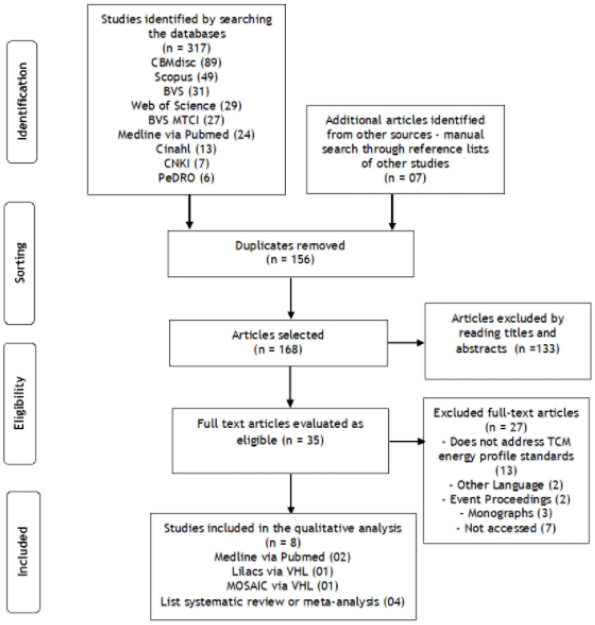
In the evaluation of primary studies, the nomenclature for the type of study indicated by the authors was maintained. When the type of study was not clearly described by the researchers, the analysis was based on the concepts of scientific methodology of nursing researchers.[13]

The studies included in the review were rated for level of evidence based on the Evidence-based practice rating: 14 level 1 - evidence from systematic review or meta-analysis of all relevant randomized controlled trials; level 2 - evidence derived from at least one well-designed randomized controlled trial; level 3 - evidence obtained from well-designed clinical trials without randomization; level 4 - evidence from well-designed cohort and case-control studies; level 5 - evidence from systematic review of descriptive and qualitative studies; level 6 - evidence derived from a single descriptive or qualitative study; Level 7 - Evidence from the opinion of authorities and / or expert committee report. Two independent reviewers performed the evaluation and a third investigator was consulted to resolve possible disagreements, with 100% agreement at the end of the analysis.

RESULTS

A total of 324 studies were found in the electronic and manual searches. Because they were duplicates, 156 were removed from the listing. After reviewing titles and abstracts, 133 articles were excluded, so 35 remained for full-text analysis. Of these, seven studies were not located (online, via bibliographic switching or direct contact with the authors) and 20 articles were excluded. Thus, eight articles were included in the synthesis of the qualitative analysis (**Figure 1**).

Figure 1 - Flowchart of selection of articles of the integrative review. *Belo Horizonte*, MG, Brazil, 2019



The publications found originated from Brazil; six articles were written in Portuguese[10-15,19] and two in English.[20-21]

Among the journals in which the studies were published, we highlight those related to the health sciences in general (50%; n = 4), 15-18 followed by acupuncture journals (25%; n = 2), 20-21. physical therapy (12.5%; n = 1) 10 and physical education (12.5%; n = 1) .19

Regarding the training of the authors of the selected studies, physical therapy predominated (62.5%; n = 5), 10.15-19 followed by dentistry (25%; n = 2), 20-21 medicine (25%; n = 2), 16-19 biomedicine (12.5%; n = 1) 16 and physical education (12.5%; n = 1) .17 It is also noted that in 75% of the studies (n = 6) , the authors also had training in acupuncture / integrative medicine.[15,17-19,20-21]

Among the selected studies, 12.5% (n = 1) presented evidence level II20; 25.5% (n = 2) presented evidence level III, 10.18 and 62.5% (n = 5) presented evidence level VI.[15-17,19,21]

A total of 317 subjects participated in the selected studies, ranging in age from 4 to 84 years, 65.6% women and 33.2% men. It is noteworthy that two studies did not provide information on the participants' age and sex[10] or on the distribution of men and women among the sample.[19]

The clinical conditions of the volunteers were: onycholysis; [15] temporomandibular dysfunction;[20-21] fibromyalgia; [16] work-related musculoskeletal disorders; [17] and cystic fibrosis; [19] in addition to healthy people.[10,18]

The characterization of the studies regarding the objectives, Ryodoraku measurement acupunctions, application method, energy profile according to TCM precepts and study conclusions are presented in **Chart 1**.

Two studies[18-19] did not explain the pattern of the energy profile found. , whether due to excess, deficiency or energy balance (Qi) of the meridians measured by means of Ryodoraku.

First Author / Year	Study Goal	Measurement Acupoints	Ryodoraku Application Method	Energetic profile	Study Outcome
BARROS (2017)[15]	Evaluate if there is an energy profile common to the carriers of onycholysis.	//	Device calibrated at 200 micro amperes and intensity of 12 volts, used cotton soaked in physiological saline solution; the participants remained seated during the measurements.	86% of the volunteers had one or more unbalanced energy meridians (F, followed by B and BP being the most frequent). The energy stagnation type pattern represented 63% of the imbalances profile. Only 14.0% showed no changes.	The predominant pattern of energy imbalance in patients with onycholysis is strongly suggestive of F. Energy (Qi) and Blood (Xue) Stagnation Syndrome.
ZOTELLI (2017)[22]	Check the effectiveness of acupuncture in treating pain; limitation of mouth opening and circulating energy in the meridians of TMD patients of muscular or mixed origin.	P9; CS7; C7; ID5; TA4; IG5 BP3; F3; R3; B64; VB 40; E42.	A skin pressure of 100 grams was established, and traditional direct current use (200 micro amps maximum in closed circuit). The probe was applied and held still over the point for one second at each measurement point, applying direct current of 12 volts. The measuring electrode was equipped with a disposable cotton tip moistened with water.	There was a predominance of a pattern of energy deficiency. The most prevalent imbalance patterns identified were the R and B-coupled meridians and the Shao Yin (C / R) and Shao Yang (TA / VB) energy planes. Yang energy decrease was found in all sessions in the Treatment Group, and the average energy value of the Yin meridians was maintained. in the placebo group Yin energy decreased during all four sessions and Yang energy decreased in all sessions.	The acupoints used were equally effective in reducing pain in both groups by increasing the mouth opening threshold only within the treatment group. They were also effective in preserving Yin energy in the treatment group. Yang energy decreased equally in both groups.
RASERA ZOTELLI (2017)[21]	Describe the patterns of Qi imbalance in TMD patients by an objective measure.	P9; CS7; C7; ID5; TA4; IG5 BP3; F3; R3; B64; VB 40; E42.	A skin pressure of 100 grams was established, and use of the traditional direct current (200 micro amps maximum in closed circuit). The probe was applied and held still over the point for one second at each measurement point, applying direct current of 12 volts. The measuring electrode was equipped with a disposable cotton tip moistened with water.	The average total energy (Qi) of the 40 volunteers was below the normal range and was classified as Qi deficiency (empty). The most prevalent imbalance patterns identified were in the kidney and bladder-coupled meridians and the Shao Yin (C / R) and Shao Yang (TA / VB) energy planes.	TMD volunteers had Qi deficiency. The most prevalent imbalance patterns identified were Qi imbalance in the coupled R and B meridians and the Shao Yin (C / R) and Shao Yang (TA / VB) energy planes.
OLIVEIRA (2014)[16]	To evaluate the effect of acupuncture on pain reduction in individuals with fibromyalgia and to analyze the impact on quality of life and skin electropermeability of these individuals.	//	The device was set at 200 milliamperes. Then a water-soaked cotton roll was fitted to the reader tip. The patient was asked to hold the metal tube under constant pressure. Bilateral acupoints were located and the reader was pressed hard for 3 seconds, proceeding to record the captured value.	The TA, IG and BP meridians were the excess electropermeability meridians in all measurements. While C, CS, VB meridians have deficiencies in electropermeability in most measurements.	Acupuncture treatment reduced pain intensity in all participants. It was also noted that there was improvement in seven of the ten items of the Fibromyalgia Impact Questionnaire and that the electrodermal activity approached homeostasis.
SANTOS (2013)[17]	To trace the energy profile of users of the human / computer Interface using the Ryodoraku electrodiagnostic technique.	P9; CS7; C7; ID5; TA4; IG5; BP3; F3; R4; B64; VB41; E41.	Device calibrated at 200 micro amperes; 12 volt intensity; Used cotton soaked saline solution. Participants remained seated during the measurements and the reading was performed on bilateral wrist and ankle acupoints.	Among the participants, 16% had no energy imbalances; the others presented energy deficiency in AT (24%), ID (18%), E (24%) and GI (18%); and energy stagnation of F (21%), BP (20%), CS (13%) and B (8%)	The most affected meridians were TA, F and BP, and TCM theories were consistent.
SCHEINKMAN (2012)[18]	To evaluate changes in the energy profile of the meridians using the Ryodoraku electrodiagnostic technique in healthy people undergoing stretching specific.	P9; CS7; C7; ID5; TA4; IG5; BP3; F3; R4; B65; VB40; E42.	The electrodes used were "pipe" type with a cotton soaked with physiological saline solution and rod type, earth, which the volunteer held tightly.	Decrease in energy imbalances in GDS group (method of osteoarticular chains and aponeurotic muscles developed by Godelieve Denys Struyf) (20%), when compared to the stretching group (7%) and the control group (0%).	There was energetic movement in both experimental groups. With improvement in the GDS group. The stretching group, besides presenting greater imbalances, also showed alternation in the type of imbalance.
MARTINS (2010)[19]	To evaluate the energy profile of patients with cystic fibrosis with the Ryodoraku technique of electrodiagnosis in acupuncture.	P9; CS7; C7; ID5; TA4; IG5; BP3; F3; R4; B65; VB41; E41.	A two-output neurometer with interrupted galvanic currents of 200 micro amps, with 12 volt intensity, was used. The volunteers were prepared (jewelry and metals removed from wrists, toes and ankles, socks and shoes). The device was adjusted, followed by the preparation of the pipe-shaped electrode, which was filled with hydrophilic cotton and 0.9% saline solution. . Participants remained seated during the measurements and the reading was performed on bilateral wrist and ankle acupoints.	BP meridian was unbalanced in 67% of the sample, followed by R and C meridian (40% in each meridian). The remaining unbalanced meridians were followed by the following scores: TA and B in 33% of the volunteers, BV and E in 27%, ID, GI, CS and F 20% and P in 7% of the sample.	The most frequently unbalanced meridian in patients with cystic fibrosis was BP, which leads us to consider and confirm the premise that the energy source is located there, although the main symptoms and shock organ is the lung.

Note: P - Lung; CS - Circulation Sex or pericardium; C - Heart; ID - Small Intestine; TA - Triple heater; BV - Gallbladder; E - stomach; R - Kidney, BP - Spleen-pancreas; F - liver; B - Bladder; TMD - temporomandibular dysfunction; ECG - resting electroencephalogram; TCM - Traditional Chinese Medicine; GDS - Method of osteoarticular chains and aponeurotic muscles developed by Godelieve Denys Struyf.

Chart 1 - Characterization of the studies regarding the objectives, Ryodoraku measurement acupoints, form of application, energy profile according to TCM precepts and conclusion. Belo Horizonte, 2019.

DISCUSSION

By surveying the studies on the Ryodoraku system, it was possible to identify that it has been applicable in the evaluation of the energy profile[15,17,19-21] by measuring the energy levels of the main meridians and the subsequent prescription of therapeutic conducts.[16] Thus , its use should be encouraged because it is an objective method and easy to handle.

Most of the scientific production is of Brazilian origin and related to the health sciences in general. Bibliometric analysis[22] showed that Brazil is among the 10 most productive countries in number of publications on acupuncture; The United States is the largest acupuncture producing country, followed by China and South Korea.

In this study, there was a predominance of studies with low levels of evidence from descriptive studies.[14] This finding makes it difficult to assess the applicability of the Ryodoraku system in the delimitation of the energy profile of individuals. In an integrative literature review aiming to analyze the national scientific production on the use of Integrative and Complementary Practices, in which acupuncture is inserted, supports this result, showing that only 10% of the studies found came from research with a level of Evidence II (well-designed randomized controlled trial) .[23]

There was also agreement regarding the amount of points selected for the application of Ryodoraku. These are a total of 24 points, with 12 bilateral acupoints on the upper and lower limbs. However, there was disagreement as to their location. Two studies15-16 did not describe the measurement points. The other six presented the use of P9; ID5; TA4; IG5; BP3; F3.[10,17-21]

C7 and CS7 were used in five studies.10,17,19-21 Points R3 and B64 were only used in two studies.20-21 Acupoints VB41 and E41 were applied in two other studies.10,17 VB40 and E42 were the points of choice in four studies.10,18,20-21 Finally, R4 and B65 were also used in four studies.[10,17-19]

This difference between the points used in the studies in relation to those established by the creator of the Ryodoraku system is due to the use of different reference protocols[24-25] adopted for the measurement of the points that make up the analysis by Ryodoraku.

However, it should be noted that although there is a variation between the points, they are all called Transport Points or Shu Points. These are known westernly as command points and are located between the fingers and elbows or between the toes and knees.[3,26] The energetic action of these points is more dynamic than the other points, which justifies the frequency of its use in clinical practice and, consequently, in evaluation with Ryodoraku.

In this sense, the TCM establishes a concept of polarity change between Yin and Yang, or vice versa, and this change occurs at the fingertips and toes, which reinforces the dynamism of acupoints in this region of the canal.[3] Thus, the channel Qi is more unstable and therefore more easily influenced due to the polarity change at this location, and is also more easily measured by the Ryodoraku system.

Given that the Ryodoraku system has been proposed for both diagnostic and therapeutic purposes, its relevance is evident by conferring greater objectivity to the diagnosis by TCM, which has hitherto been sustained by a subjective assessment of individuals' energy imbalances. In this sense, the method can be considered as a new strategy that can give acupuncture more scientificity in order to make it more understandable to Westerners.[5]

Currently, the most commonly adopted assessment according to TCM includes different semiological techniques consisting of anamnesis and physical examination. This occurs through pulse evaluation, tongue

inspection, abdominal palpation and acupuncture channel palpation. Thereafter, the therapy is performed by choosing the acupuncture points.[27] In this sense, the clinic has been sovereign, not being replaced by equipment. However, when this assessment is performed in association with Ryodoraku, more assertive diagnosis and treatment can be obtained by associating them with the objectivity that the system can give to subjective assessment.

In view of this, it is essential to highlight that the assessment within the scope of TCM aims to understand how each individual interacts with the energy and environmental factors with which they live. This occurs by investigating information that includes exploring how the events and circumstances surrounding each of the subject's life stages influence the onset of signs and symptoms and the subsequent correlations between them, which characterize each person's individuality. and that will determine a certain pattern of personal response.[28] In this context, it is important to point out that the use of technology, either as an assessment or treatment instrument, should be intended to complement the therapeutic conduct and not replace the interaction between professional and patient, whose main focus is qualified listening.

Given the advantage of being an effective and fast technological resource, Ryodoraku presents itself as a device to be considered, both in clinical practice and in the development of studies based on Evidence-Based Practice. The relevance of this system lies in the fact that it employs an evaluation method that involves statistical and objective processing based on a logical system.[19] These characteristics allow the measurement to take place objectively and thus the comparison to verify its accuracy. applicability is more assertive.

Moreover, the Ryodoraku system has anticipated the process of computerization in the clinical area of oriental medicine, becoming an appropriate method at this time of technological advances. The literature corroborates this statement by pointing out that the health field continually aims to improve its actions through innovations that can provide better diagnostic and therapeutic alternatives.[29]

CONCLUSIONS

The Ryodoraku system does not yet provide consistent evidence of its use, limiting the assessment of its applicability.

The limitation of the present study refers to the number of articles found. Language restriction may have limited the inclusion of studies from China, where the origin of TCM is concerned, and from Japan, where the Ryodoraku system was created. In addition, important articles may not have been redeemed as they are not available in electronic format.

Therefore, it is suggested to develop studies using Ryodoraku, with stronger and more assertive methodological designs, and with more robust analyzes, in order to strengthen the evidence-based practice and prove the applicability of this method of electrodiagnosis.

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