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A Questionnaire Survey to Establish Current Clinical Practice of Radial Extracorporeal ShockWave Therapy (rESWT) for the Management of Pain and Functional Impairment on Chronic Lateral Elbow Tendinopathy in Nicosia

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Abstract

Background: Chronic Lateral Elbow Tendinopathy is a common painful condition that may affect daily function and ability to work. Physiotherapy is the most commonly used conservative intervention but there is a wide range of treatment options within the umbrella of physiotherapy. One of the most common physiotherapy treatments for chronic Lateral Elbow Tendinopathy is radial Extracorporeal shockwave therapy. The aim of the present questionnaire survey was to establish current clinical practice of pain and functional impairment associated with chronic Lateral Elbow Tendinopathy through the self-reports of chartered physiotherapists of Nicosia.

Methods: A questionnaire survey was conducted to establish current clinical practices for radial Extracorporeal shockwave therapy for the management of pain and functional impairment associated with chronic Lateral Elbow Tendinopathy based on the self-reports of Nicosia chartered physiotherapists who used this treatment in their clinical practice. Data was managed using descriptive statistical analysis.

Results: 68 respondents (66%) who worked with chronic Lateral Elbow Tendinopathy patients reported that they predominately used radial Extracorporeal shockwave therapy to treat chronic Lateral Elbow Tendinopathy. They used a standardized treatment regimen of 1 session of treatment per week for a four-week period to treat chronic Lateral Elbow Tendinopathy. All respondents reported that the radial Extracorporeal shockwave therapy is an effective not time-consuming treatment to treat chronic Lateral Elbow Tendinopathy but expensive for therapist and patient.

Conclusion: The results of the questionnaire present a representative view of current clinical practice of radial Extracorporeal shockwave therapy on chronic Lateral Elbow Tendinopathy at least as this treatment is applied in Nicosia. How much this reflects usage in the rest of Europe, or even the world, is yet to be seen by extending the research.

Keywords: Lateral elbow tendinopathy; Extracorporeal shockwave therapy; Questionnaire

Abbreviation: LET: Lateral Elbow Tendinopathy; rESWT: Radial Extracorporeal Shockwave Therapy

Introduction

Lateral Elbow Tendinopathy (LET) seems to be the most appropriate term to use in clinical practice because all the other terms, such as lateral epicondylitis, lateral epicondylalgia, lateral epicondylosis, and/or tennis elbow, make reference to inappropriate etiologic, anatomic, and pathophysiologic terms[1]. LET is one of the most common lesions of the arm work-related or sport-related pain disorder. The condition is usually defined as a syndrome of pain in the area of the lateral epicondyle [2]which may be degenerative rather than inflammatory[3]. Hence, the increased presence of fibroblasts, vascular hyperplasia, proteoglycans, and glycosaminoglycans together with disorganized and immature collagen may all take place in the absence of inflammatory cells[4]. The most commonly affected structure is the origin of the extensor carpi radialis brevis[4]. The dominant arm is commonly affected, peak prevalence of LET is between 30 and 60 years [2]and disorder appears to be of longer duration and severity in women [3].

The main complaints of patients with LET are pain and decreased function[2,3]both of which may affect daily activities. Diagnosis is simple, and a therapist should be able to reproduce this pain in at least 1 of 3 ways: (1) digital palpation on the facet of the lateral epicondyle, (2) resisted wrist extension and/or resisted middle-finger extension with the elbow in extension, and (3) by getting the patient to grip an object [2,3,5].

Although the signs and symptoms of LET are clear and its diagnosis is easy, to date, no ideal treatment has emerged. Many clinicians advocate a conservative approach as the treatment of choice for LET[2,3]. Physiotherapy is a conservative treatment that is usually recommended for LET patients [2,3]. A wide array of physiotherapy treatments have been recommended for the management of LET[2,3]. These treatments have different theoretical mechanisms of action, but all have the same aim, to reduce pain and improve function. Such a variety of treatment options suggests that the optimal treatment strategy is not known, and more research is needed to discover the most effective treatment in patients with LET [2,3].

One of the most common physiotherapy treatments for chronic LET is Extracorporeal shockwave therapy (ESWT). ESWT is a safe noninvasive procedure [6]in which a device delivers acoustic energy (shockwaves) through the skin surface onto the affected area. Focused shockwaves are typically generated by electromagnetic or piezoelectric

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techniques[7]. Radial shockwave (rESWT) is non-focused and generated by a ballistic source[8]. Recently research has started to be published on rESWT, which is relatively new and a promising modality to treat LET. ESWT may promote the release of angiogenetic growth and proliferating factors (e.g. vascular endothelial growth factor and endothelial nitric oxide synthase) that induces neovascularisation for tissue regeneration [7]. Furthermore, ESWT may down-regulate inflammatory mediators and directly suppress nociceptors by hyperstimulation analgesia[9].

To our knowledge, there have been no studies to establish current clinical practice of rESWT for the management of pain and functional impairment associated with chronic LET. Therefore, the aim of the present questionnaire survey was to establish current clinical practice of pain and functional impairment associated with chronic LET through the self-reports of chartered physiotherapists of Nicosia.

Methodology

Design of questionnaire

No validated instrument (questionnaire) existed for the purpose of assessing the self-reports of physiotherapists on their management of chronic LET using rESWT. Therefore, the investigator of the present survey (DS) designed a questionnaire based on previously published questionnaires that established the current clinical practice of physiotherapy treatments such as LPLL and cryotherapy[10,11,4]. In addition, experts in this field were contacted and their comments on the draft questionnaire design sought. The final questionnaire comprised: (i) background information; (ii) the beliefs and opinions of respondents who worked with chronic LET regarding signs, symptoms and management of LET; and (iii) the self-reports of respondents who worked with chronic LET using rESWT.

Background information

Respondents were asked to report on how many years they had practiced, their area of specialisation, and if they worked with patients with chronic LET. The last information was particularly important as this was used to exclude respondents who never saw LET patients in their practice.

Respondents' beliefs about signs, symptoms and management of LET

In this section the respondents who worked with chronic LET patients were asked to report on which of the below terms (such as LET, lateral epicondylitis, tennis elbow, lateral epicondylalgia, extensor tendinosis, extensor tendonitis and extensor tendinopathy) was in their opinion the most commonly used to describe the LET condition. Respondents in this section were also asked to report, according to their belief, (i) if the ECRB was the most commonly affected structure of LET, (ii) if LET patients complained of pain during digital palpation conducted by therapists, (iii) if LET patients complained of pain during gripping and (iv) if resistance of the wrist extension with the elbow in extension was the most common diagnostic test in LET patients. Respondents were also asked to report, in their opinion, (a) whether they had read an article about the conservative management of LET recently, (b) whether they had attended a course about the conservative management of LET during their careers, and (c) if they knew that more than 40 different treatments have been reported for the management of LET in the literature. For the purposes of the survey, the meaning "recently" was defined as four months or less before respondents receiving the questionnaire.

Self-reports on their own clinical management of LET by respondents who work with chronic LET using rESWT

Respondents who reported that they used rESWT to treat chronic LET were then asked to report, in their opinion, (i) the aim; (ii) how many chronic LET patients were managed in a clinical setting the last month; (iii) the treatment regimen (number of treatment sessions and frequency of treatment), the protocol (individual or standardised) and the compliance; (iv) the clinical outcome (short-term and long-term effects); (v) the side effects and the contraindications; (vi) if the treatment was painful for patients; and (vi) the cost (expensive or not) and the risk (time consuming or not) applications. All these questions were asked related to the treatment the respondents used to treat LET.

Pilot procedure

A pilot study using the described above questionnaire was carried out in early November 2015. The number of subjects required for a pilot study is often dependent on circumstance and resource [12-15]. Georgoudi, Watson & Oldham (2000) report that ten subjects is a satisfactory number[16]. Since ten subjects have been used to run pilot studies for other questionnaire surveys, the present questionnaire was administered to ten physical therapists in Nicosia. The ten physiotherapists who were selected for the pilot study were drawn from the population for inclusion in the main study. The design of the questionnaire was subsequently discussed with the respondents and their comments noted. The results of the pilot study were not included in the final data analysis.

All respondents returned the questionnaire. Seven out of ten questionnaires were fully completed. Based upon the comments received during the pilot study, limited rewording of a number of questions was thought necessary to improve clarity. The meaning of word "recently" had to be defined (question 9). It was also necessary to reword the questions that asked when respondents attended a course about the conservative treatment of LE and who reproduced the pain in patients by digital palpation. No additional negative comments or feedback about the completion of the questionnaire were received during the pilot study. Respondents noted that the questionnaire included clear and concise instructions on how to complete it, using simple language and leaving adequate space for them to make comments. Finally, respondents mentioned that the questionnaire held their interest and was completed easily.

Translation procedure

In translating an assessment instrument to a different language, misrepresentation may arise and a multi-step translation and validation process is essential for truly successful translation. These steps include a forward translation, blind back translation and pilot testing [17].

As recommended by the European Organisation for Research and Treatment of Cancer (EORTC) in their manual "EORTC quality of life study group: translation procedure" [17], for all translations, the translator(s) should be a native speaker of the language into which the questionnaire is being translated, with a high fluency in the other relevant language. The translation back to the original language should be undertaken independent of the forward translation, i.e. by a different translator, independent of the first[17].

The present questionnaire did not follow this translation procedure. For the pilot and main study, it was written in English and translated into Greek by the investigator of the project for the purposes of administering it to chartered physiotherapists in Nicosia.

Survey procedure

The mail addresses of the 300 Nicosia members of the Cyprus Physiotherapy Association were obtained and random samples of 220 Nicosia physiotherapists (73%) were sent the questionnaire, accompanied by an invitation letter in mid-January of 2016.

The questionnaire was designed to assure the confidentiality and anonymity of the responding physical therapists, since there was no coding to identify the questionnaires. Physical therapists completed the questionnaires and sent the completed questionnaires to the investigator using the self-addressed stamped envelope that was included. When the questionnaire was returned, the returned envelope was discarded maintaining the confidentiality and anonymity of the subjects' responses to the questionnaire.

Oppenheim (1992) suggests that questionnaires should be returned in a period of two weeks from the time they are distributed to participants[18]. However, such a period of time is not long enough to provide a high response rate. Therefore, the investigator of the project chose to extend the deadline of the present study for two more weeks, giving an opportunity to the participants to return the questionnaires in four weeks (by mid-February 2016) from the time which they received them. This deadline was extended in the hope of increasing the response rate. No questionnaires were received after the deadline of the four weeks. No follow-up reminders were sent to assure anonymity.

Data analysis

Data was managed using descriptive statistical analysis

Results

Response rate

Of the 220 questionnaires, 150 (68%) were received by mid-February 2016. Overall, the response rate of the present study was 68% and can be considered as approaching very well. Currier (1990) states that returns of 40% to 50% or less are common, and a response rate of 60% is good and 70% is very good[19].

Of the 150, 47 respondents (31.3%) reported that they did not work with patients who had chronic LET. They were excluded from the analysis. Out of the remaining 103 respondents, 35 (34%) who worked with chronic LET patients reported that they never used rESWT to treat chronic LET. They were also excluded from the analysis. The remaining 68 respondents (66%) who worked with chronic LET patients reported that they predominately used rESWT to treat chronic LET. Results of the analysis of these 68 completed questionnaires are presented below.

Background information

The mean professional experience of respondents who work with chronic LET using rESWT was 15.93 (95%CI= 14.26-17.59) years. Orthopaedic and sports medicine physiotherapy were the specialized areas of respondents. Out of the 68 respondents, 37 (54.4%) were specialists in orthopaedic physiotherapy.

Beliefs regarding signs, symptoms and management of LE

Respondents were permitted to identify which term (such as LET, lateral epicondylitis, tennis elbow, extensor tendonitis, lateral epicondylalgia, extensor tendinopathy and extensor tendinosis) they used to describe the LET condition. LET was the most common answer, reported by 45 out of 68 respondents (66%).

64 out of 68 respondents (94%) reported that the ECRB tendon is the most common affected structure on LET. All respondents (68, or 100%) reported that LE patients complain of pain by digital palpation conducted by therapists on the affected site and by gripping. In addition, 57 out of 68 respondents (84%) reported that the resisted wrist extension with the elbow in extension is the most common diagnostic test in practice for LET patients.

Out of 68 respondents, 12 (17.5%) reported that they had read an article about the conservative management of LET recently. Out of 68 respondents, 5 (7.5%) reported that they had attended a course about the conservative management of LE during their career. Finally, out of 68 respondents, 18 (26.5%) stated that they knew that more than 40 different treatments methods have been reported in the literature for the management of LET.

Self-reports on their own clinical management of LET

All respondents reported that the reduction of pain and the improvement of function, individual or combined, were the main aims of rESWT treatment. It should be noted that respondents had the option to give more than one answer.

During the month prior to the survey, a total of 191 chronic LET patients had been reported to be managed by the 68 respondents in a clinical setting with rESWT.

All respondents (68, or 100%) reported that they used a treatment regimen of 1 session of treatment per week for a four-week period to treat chronic LET. In addition, all respondents (68, or 100%) reported that they used a standardized treatment protocol during the treatment period to treat chronic LET.

All respondents (68, or 100%) reported that they administered rESWT to treat chronic LET only in a clinical setting. All respondents (68, or 100%) reported that rESWT was effective in the short-term (one month after the end of treatment) and in the long-term (six months after the end of treatment).

All respondents (68, or 100%) reported that the main side-effects of rESWT to treat chronic LE are pain and redness. All respondents (68, or 100%) reported that rESWT has no contra-indications in cases of chronic LET.

All respondents (68, or 100%) reported that rESWTis a pain-free treatment to treat chronic LET. All respondents (68, or 100%) reported that this treatment was an expensive treatment not only for patients, but also for physiotherapists. All respondents (68, or 100%) reported that rESWT was not harmful for clinicians' hands and no prophylactic measures were needed either for the therapists or for patients during its application.

All respondents (68, or 100%) reported that the rESWT is not a time-consuming treatment to treat chronic LET.

Discussion

The primary aim of this questionnaire survey was to establish current clinical practices for rESWT for the management of pain and functional impairment associated with chronic LET based on the self-reports of Nicosia chartered physiotherapists who used this treatment in their clinical practice. This is the first questionnaire survey to address this question.

Owing to a lack of comparable data, it is not possible to say whether the proportion of respondents who reported that they predominately used rESWT to treat chronic LET is high or low. The same conclusion about the number of chronic LET patients who were managed during the last month in clinical settings using rESWT must be drawn under

consideration. RESWT was a commonly used treatment in practice. The most likely explanations for this are that the rESWT is a common physiotherapy treatment for a plethora of musculoskeletal disorders, no special training machines are needed, no specific "skills" from the physiotherapist are needed, more patients are familiar with it, and patients can understand that they are receiving a real treatment. Future surveys are needed to confirm these explanations and/or to add more.

It was reported that the aim of rESWT was to reduce pain and improve function. This answer was expected because this is the priority aim of physiotherapy management[20].

The recommended regimen for rESWT in the treatment of chronic LET is once per week for 3-5 weeks. All respondents who predominately used rESWT to treat chronic LET reported in the present survey that they administered this treatment for chronic LET once per week for four weeks, supporting the findings of the literature. All respondents reported that they used a standardized treatment regimen. The previously reported regimen may be recommended because of convenience with the clinical route/routine, or alignment with manufacturers' recommendations, expert advice, and/or personal experience. Future surveys might reveal why all clinicians reported the same treatment regimen. Such research was beyond the scope of this project.

Clinicians reported that they believed that rESWT was an effective treatment for chronic LET in both the short term (one month after the end of treatment) and in the long term (6 months after the end of treatment). However, the exercise program is the most effective conservative treatment approach in the management of LET. The rESWT is recommended when the exercise program fails or other conservative techniques fail. It is known that all the other types of conservative therapy are less effective than the exercise program in the management of LET. In addition, ESWT does not use as a substitute for exercise but as a supplement to exercise program.

In addition, the choice of treatment should be based not only on clinical effectiveness, but also on clinical considerations such as which treatment is the most time efficient, which is the least expensive and which is the least invasive[21]. Clinicians reported that they believed that rESWT was not time-consuming procedure for them to apply, probably due to the nature of clinical rote/routines.

Clinicians reported that rESWT was an expensive treatment. This treatment is expensive because devices that deliver rESWT are costly. In addition, it must be administered under the supervision of a physiotherapist and the physiotherapist cannot treat other patients at the same time.

RESWT advocates reported that the application of this treatment for the treatment of chronic LET caused pain and redness. The two previously reported adverse effects are common. The implication is that this treatment is both safe and effective in producing pain relief and function improvement. Clinicians also reported that this treatment cause no side effects in patients during their application.

A weakness of the present survey is that it is based on self-reports made retrospectively. This can be a problem when respondents are asked to look back and estimate the frequency of a particular behaviour. To avoid this problem a valid and reliable questionnaire has to be designed. A questionnaire is valid when it measures what it claims to measure and is not subject to bias [22]. Reliable questionnaires yield consistent results from repeated samples and different researchers over time[23,24]. Just because a questionnaire has been piloted on a few of your colleagues, used in previous studies, or published in a peer-reviewed journal does not mean it is either valid or reliable.

Therefore, before administering a questionnaire, researchers have to be confident that the questionnaire is valid and reliable. However, in the present survey, the process of questionnaire development cannot ensure a high level of validity and reliability. Unfortunately, this lack of a high level of validity and reliability is supported by the fact that the group of questions about beliefs of signs, symptoms and management of LE offers nothing to the aim of the study. These questions are therefore not discussed in this section. Nevertheless, the experience of respondents in diagnosis and management of LE was reported in the second section of the questionnaire. According to respondents' answers it can be concluded that they could diagnose LE simply, easily and quickly but their level of recently informing (updating) in the management of LE, apart from the treatment that they used, seemed to be low.

This problem could have been avoided if a more valid and reliable questionnaire had been developed and a two-stage questionnaire survey had been carried out. Although no important negative comments received during the pilot study of the present questionnaire, just a pilot study is not enough to confirm the validity and reliability of a questionnaire. A valid and reliable questionnaire could be developed following the techniques outlined by Oppenheim (1992) and Sapsford (1999)[18,25]. These techniques include: interviews of potential participants to identify issues about the topic and so to develop questionnaire items; comparison the list with the issues identified during the interviews with published and unpublished similar questionnaires; comments from all participants interviewed during the development of questionnaire on its content in order to suggest additional issues or questions; development a bank of questions to produce multi-items scales, which are more reliable than single questions [26]; administration of questionnaire by interview to potential participants. Questions which are confusing, ambiguous, or gave very skewed responses will be either removed, rewritten, or replaced; two further postal pilot studies for clarity will be conducted maximizing the issues that reported by participants as important; a proportion of participants will be asked to complete a second questionnaire later the same day with the administration of questionnaire and return it by post as a test of test-retest reliability; some practitioners who are not otherwise involved in the development of questionnaire will be review the components of questionnaire to recheck validity of questionnaire; statistical tests calculating Cronbach's coefficient and a matrix of Pearson's correlation coefficients.

Later, in the first stage of a two stage questionnaire survey, a letter could be sent to all eligible participants to discover who predominately managed LET patients using rESWT. For the second phase of the questionnaire survey, the questionnaire would be forwarded for completion to all those who predominately used rESWT to manage LET. However, due to time and cost constraints, it was not possible to follow the above research design in the present survey.

The validity and reliability of the questionnaire might seem to be in doubt because of these reservations. In light of the nature of the study, it would have been anticipated that rESWT as used for the management of chronic LET, would be overstated in the responses to this questionnaire, because rESWT is one of the most common treatments for chronic LET and attractive to practitioners working in rehabilitation settings. However, this did not occur, since 68 out of 150 respondents used rESWT to treat chronic LET. If so, given the response rate, the length of experience reported by respondents and the amount of detail in their answers, it may be confidently assumed that the above results present a representative view of current clinical practice of rESWT on chronic LET at least as this treatment is applied in Nicosia.

How much this reflects usage in the rest of the Cyprus, Europe, or even the world, is yet to be seen by extending the research.

Conclusion

A questionnaire-based survey was conducted to establish the current clinical practice for rESWT in the treatment of chronic LET, based on the self-reporting of chartered physiotherapists in Nicosia who are using this treatment in their clinical practices. It appears that research in this area is warranted not only to substantiate the subjective findings of individual physiotherapists, but also to explore the possible clinical relevance of this treatment. While cellular and animal models have their part to play and can provide much useful information in this respect, the work would be best completed in human subjects by conducting well-designed clinical trials.

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