

A critical appraisal of “Comparison of extracorporeal shock-wave therapy and wrist-extensor splint application in the treatment of lateral epicondylitis: a prospective randomized controlled study”

By

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Abstract

This is a critical appraisal of the research paper “Comparison of extracorporeal shock-wave therapy and wrist-extensor splint application in the treatment of lateral epicondylitis: a prospective randomized controlled study”, a single-blinded, clinical randomized control study by Abdulkadir Aydin and Ramazan Atic in Turkey. Following an extensive literature search, this article was chosen to be appraised due to its clinical applicability, well designed study, and usefulness in answering my clinical question, “is Extracorporeal Shockwave Therapy more effective for treating lateral epicondylitis in comparison to other treatment methods?” The strengths and weaknesses of the study introduction, methods, results, and discussion section were appraised and the clinical applicability was discussed. The paper was appraised to be reliable enough to apply clinically, due to the well-organized design, sufficient follow up, and unbiased conclusion.

Key words

Lateral Epicondylitis, Extracorporeal Shockwave Therapy, Wrist Extensor Splint Therapy

Introduction

Lateral Epicondylitis is a very commonly seen overuse injuries in the out-patient physical therapy clinic. Many modalities and interventions have been used extensively to treat this condition, with varying amounts of evidence and possible complications. However, when a PT is deciding whether to invest in a particular modality or not, it is important to understand not only if the modality is effective, but also if it is more effective than other modalities. One modality similar to ultrasound, Extracorporeal Shockwave Therapy, claims to increase regeneration of tissue, decrease inflammation, and decrease pain by sending shockwaves into a patient's tissue. However, the possible adverse side effects and high cost require that this modality demonstrate not only positive research when compared to control groups, but also better performance in improving Lateral Epicondylitis pain when compared to other modalities. This leads to my clinical question, is Extracorporeal Shockwave Therapy more effective for treating lateral epicondylitis in comparison to other treatment methods?

Methods

Before beginning my literature search, I had to decide what database I would use. I decided to use Pubmed and Angelo State University's U-search. Pubmed is a nationally renowned online data base, and U-search is an online literature search database that also gave me the option to ask for access to nonpublic literature via the ASU interlibrary loan. The key words I used in my search were "Extracorporeal Shockwave Therapy," "Lateral Epicondylitis", "Tennis Elbow", and "Ultrasound". None of my searches produced more than a hundred hits, and I began reviewing literature when I received 40 hits. The limits I included on my search were "English" and "Publication in the last 10 years."

After an extensive literature search, I chose “Comparison of extracorporeal shock-wave therapy and wrist-extensor splint application in the treatment of lateral epicondylitis: a prospective randomized controlled study”, by Abdulkadir Aydin and Ramazan Atic. This article was published in 2018 in Diyarbakir, Turkey by the Journal of Pain Research, a well accredited journal with an impact factor of 2.581. Since this article was published by such a well accredited journal, I examined it more extensively, and, after doing so, I found it to be a well-organized, clinical randomized control study, thus meeting the general criteria required for my critical appraisal. Though I found two other articles that also compared ECSW to other LE treatment modalities, this article seemed to do the best job of answering my clinical question.

Results

Summary of the study

Lateral epicondylitis is an overuse injury that affects the wrist extensors and results in pain, discomfort, and inability to effectively use the injured arm. Extracorporeal shockwave therapy is a modality used to treat Lateral Epicondylitis, but it's actual effectiveness based on literature is still inconclusive. Wrist-extensor splints are a more common treatment method, but also do not have complete support from research. 67 patients were gathered and treated for 4 weeks, with either ESWT or WES. Both groups saw improvement, however, there was no statistically significant difference between the two groups.

Appraisal of the study introduction

The introduction provides good background information on Lateral Epicondylitis. The majority of the articles were current and credible. The critical variables were addressed, but not especially clearly in the introduction. However, I could still deduce from the introduction that the independent variable are

ESWT or WES and the dependent variables are clinical characteristics, pain, and quality of life. Overall, the introduction was clear and was well written and gave an adequate understanding of Lateral Epicondylitis.

The authors gave little to no background on either of the modalities, their backing by research, or how they are utilized to treat Lateral Epicondylitis. There was no clear conclusion from the literature review, and the author did not use literature to form a sound rationale for the study. The first two articles were before 2000, one of them dated in 1979. The main weakness in the introduction is inadequate explanation of the independent variables (the modalities), or clearly stating what the independent variables were.

Appraisal of the study method

Overall, the methods section was well designed. The research design is a quasi-experimental, prospective, longitudinal design. Since only 6 subjects withdrew (3 refused to participate for unknown reasons, and the other 3 did not want to experience the modality), it is clear the attrition rate is not abnormally high. This study is a between-subjects design with two groups, in which the clinicians were masked to each subject's respective group assignment. Both groups had the same clinical characteristics, and both groups were treated the same (they were given wrist and forearm strengthening exercises and told to not use pain medication). The study methods could be replicated, since the researchers specify the amount of times ESWT was used and on what area, while the WES section included instructions about the angle of the wrist and length of use. The diagnostic tests appeared reliable, and one of the diagnostic tests, The Mill's test, was supported by cited evidence. In addition, the proposed outcome measures were explained and could be replicated.

However, the methods section has weaknesses as well. The subjects group assignment was not masked. No sociodemographic information was given about the groups in the method section (though the results section does later show the sociodemographic information is similar between groups). In addition, no control group was used, and though this may be understandable given the limited number of subjects with LE, having control groups would make this research paper much better. Most of the outcome measure tools were not described in sufficient detail, and many seemed to be more objective ways of evaluation (based on elbow pain, etc.). In addition, both groups were given wrist- and forearm-strengthening isokinetic exercises, and they assumedly did the same amount of exercises. However, in a clinical treatment session, patients would have more time to do those exercises if they did not spend time during the rehab session to receive ECSW therapy. So it would have made more clinical sense if the ECSW group was given less exercises to reflect clinical realities.

Appraisal of the study results

The results section is written in a clear and organized manner, talking first about the demographics, then description of the outcome measures for the ESWT group, the WES group, and then a statistical comparison between the two groups. This is a similar order to that found in the methods section. The Visual Analog Scale, SF36 Health Survey form, and Patient-Rated Tennis Elbow Evaluation (PRTEE-T), and the Nirschl scale were all reported in the results section, so the authors did not fail to use any of the outcome measures outlined in the methods section. The tables representing the data are made in clear and concise manner. In addition, all of the results comparing pre-treatment and post-treatment that are statistically significant are clearly identifiable in the tables.

The research question involved comparison of the efficacy of the two modalities on Lateral Epicondylitis, however, there was no specifically stated hypothesis in the study. Also, the parameters of the Confidence Interval are not included in this study, which could have been very helpful in interpreting the data. Neither of the concepts of Minimally Clinically Important Difference or Number Needed to Treat (MCID or NNT) are specifically addressed before the author began analyzing the data.

Appraisal of the study discussion

The authors did a good job of indicating further meanings of their findings, by expanding on known information concerning Lateral Epicondylitis and the most effective modalities. The authors also do a good job of tying their findings into current literature by citing 5 different pieces of literature in particular, and referencing several other studies. All of the cited literature appears to be from credible journals. Since both modalities had similar efficacy, there was no course of action shown directly from the study. However, the researchers recommended WES, since it is cheaper, simple, and has no adverse effects.

The main limitation is that all of the outcome measures are self-reported, and that the number of subjects in the study was low. No future study is suggested, and the discussion section could have improved dramatically if they had suggested another study, such as one comparing ECSW to another modality, or WES to another modality.

Discussion

This study has great clinical significance to current PT practice. Before a clinician makes a financial investment in an expensive modality such as ECSW, it is important that the PT knows

that it is the best option. Unfortunately, this study only gives part of the picture when it comes to answering my clinical question, but, by comparing ECSW to another well-known modality for treating LE, it is extremely helpful in doing so.

The authors do not favor one intervention over the other until the end of the article, where they show a slight favor towards Wrist Extensor Splints, since this intervention is cheaper, easier to apply, and does not cause complications. Overall, I would agree with them, ECSW is too expensive and risky of a treatment to warrant using in favor of another just as effective treatment. However, the authors could have improved their argument if they had mentioned that using WES saves time in the clinic, allowing for more time to give other kinds of therapy.

I have enough confidence in the research validity of this study to apply it to my patients. This study was published by “The Journal of Pain Research”, a well accredited journal with an impact factor of 2.581. Even though the study authors cite low subject number as one of the weaknesses of their paper (67 subjects), I would consider that good number for a PT study. I could possibly see myself implementing WES in the future, since this modality seems fairly inexpensive and easy to apply, but I will definitely not invest in a ECSW device, at-least for treatment of LE, since it is not any more effective then ECSW.

In conclusion, “Comparison of extracorporeal shock-wave therapy and wrist-extensor splint application in the treatment of lateral epicondylitis: a prospective randomized controlled study” is a well written, well organized paper. Despite a few shortcomings, the authors do a great

job in coming to an unbiased conclusion. This paper will be a valuable resource to clinicians in the future attempting to treat patients with LE.