**Physiotherapy for Tennis Elbow – A survey of knowledge and practice within the UK.**

**Abstract**

The purpose of the survey was to investigate the current state of knowledge and practice regarding Tennis Elbow (TE) within a physiotherapy population. A secondary purpose was to explore attitudes towards emerging electrotherapeutic technologies in the treatment of TE and to ascertain if culturally, within Physiotherapy, there could be bias against such technologies due to a historic lack of high quality evidence surrounding them.

The survey was undertaken entirely online using an e-mail cascade and 253 responses were gained. Overall, respondents overestimated the strength of evidence supporting a list of common treatment modalities. Where electrotherapeutic modalities were concerned however, the vast majority of the sample though the evidence was poor. Where diagnosis and management were concerned the majority of respondents appeared to practice in an evidence based fashion.

Perhaps the most important finding of the study is that a third of respondent though they might be biased against new electrotherapeutic technologies, even if they were using them within a research setting. The implications of this are discussed in the context of how factors such as communication and therapist affects may change treatment outcomes.

**Contribution of paper**

* The study represents the only up to date survey of current knowledge and practice regarding Tennis Elbow in a UK and Ireland physiotherapy population.
* The study adds new knowledge that a third of physiotherapists may be biased against emerging electrotherapeutic modalities and discusses that through factors such as communication and therapist effects this bias may affect treatment and research outcomes.

**Introduction**

Tennis elbow (TE), or lateral epicondylalgia, is characterised by pain and tenderness over the lateral epicondyle of the humerus [1]. The condition is commonly caused by repetitive strain or excessive loading involving gripping and wrist use. It can cause pain, disability and work loss if it becomes severe or chronic [2].

Tennis elbow is relatively common with a population prevalence of 1-3% and it is the most common form of chronic elbow pain [3]. Although there is no robust data on work loss due to TE specifically, as opposed to grouped repetitive strains or tendinopathies, epidemiological data suggests it is one of the most common tendinopathies to cause work loss [4].

Assessment of TE is based on subjective history and examination. Symptoms are often of insidious onset, most commonly in the dominant arm, and cause pain radiating from the common extensor origin distally down the forearm. Activities that involve strong or repetitive gripping with the wrist in extension most commonly cause TE pain, [5]. Examination findings may include localised tenderness on palpation, reduced grip strength due to pain, and pain on resisted middle finger extension. Range of movement is not usually reduced. Differential diagnoses include, cervical radiculopathy, elbow arthritis, and rheumatological conditions affecting the elbow [5].

Very little high quality evidence exists regarding the treatment of TE. There is only low quality evidence for the use of nonsteroidal anti-inflammatory drugs (NSAID’s) [6], and no specific evidence regarding the use of paracetamol. There is also only low quality evidence regarding corticosteroid injection with some concerns over longer term outcomes and complication rates, [7,8]. Evidence for physiotherapy interventions is mixed, with guidelines suggesting strengthening may be more helpful than stretching, and that ultrasound may have some benefit [9]. Although there is some moderate quality evidence for the effectiveness of physiotherapy in the short term, there is no significant difference in one year outcomes [8]. There is no evidence to suggest the benefit of surgical intervention over non-surgical or sham interventions [10].

Although Bateman et al [11] undertook a survey of the treatment of TE within the UK in 2017, the study population was mixed, with 142 physiotherapists and 123 surgeons completing the survey. The survey primarily asked respondents regarding first and second line treatment recommendations and only in chronic cases with over 6 months of symptoms. With a likelihood of potentially different responses from the two populations, physiotherapists and surgeons, and results being presented as a conglomerate, this study does not represent a survey of physiotherapy specific clinical practice. Also, it did not assess the populations awareness of the current evidence base in order to contextualise results, and did not ascertain what specific treatments were considered as “Physiotherapy”.

The purpose of the current study was to establish the state of knowledge and physiotherapy practice regarding TE within physiotherapists in the UK and Ireland. Further to this, it is well known that there can be a significant lag in the translation of new research evidence and technology into practice [12]. A second aim of the study was therefore is to establish the attitudes and opinions of physiotherapists regarding the use of new technologies in practice, particularly energy based treatments.

Lastly, within physiotherapy, there are certain treatments that may have culturally gained a ‘bad reputation’. Treatments, such as ultrasound, that were ubiquitous a decade or more ago [13], have since been found to lack high quality evidence, and there usage has reduced substantially. Experienced therapist that were practicing when these treatments were common may now view new energy based treatments that appear similar with significant scepticism. Anecdotally, some therapists may therefore hold biases against new energy based treatments perceived to be similar to older treatments that have poor reputations.

Intense Therapeutic Ultrasound (ITU) is one such emerging energy based treatment for tendinopathies. Although it is accurate to use the term “Ultrasound” regarding the output of the device, it is very different in its mechanism to the kind of traditional ultrasound that may have a gained a poor reputation with physiotherapists. The treatment has some initial evidence in the treatment of TE [14] and secondary to widespread Food and Drug Administration (FDA) approved use in non-surgical brow lifts has significant evidence regarding its safety.

With this new treatment about to undergo double blind placebo controlled trial within the UK, the survey sought to investigate if it is possible that therapists could be biased against the treatment. If bias exists, it is known that through variables such as expectations and communication [15], treatment outcomes can be adversely affected. The final aim of the study was therefore to investigate whether respondents might feel any bias towards a new energy based treatment such as Actisound, even if they were administering it within the context of research.

**Method**

As an entirely anonymous online survey of clinical staff with no personal identifiable data collected, Health Research Authority regulations confirm no ethical approval was required for the study. The survey was undertaken exclusively online using a cascade e-mail methodology. The online survey platform ‘Survey Monkey’ was employed to collect the data. The initial e-mail was sent out by the study leads to contacts likely to have their own significant networks to forward the study invitation e-mail on to. The study was also broadcast on the UK Chartered Society of Physiotherapy interactive online message board. The study invitation e-mail contained a brief description of the survey being undertaken, a link to the survey itself, and a request that recipients cascade the invitation to their own relevant contacts. Those receiving the invitation were informed the survey was being undertaken anonymously.

The survey was split into three sections. The first section collected professional demographic data and also asked respondents to rate how strong they felt the research evidence was for a list of currently used treatments for tennis elbow. In order to minimise the number of questions, the decision was made not to collect data on gender as this was not deemed relevant and the much higher proportion of female practitioners within the profession in the sampled populations is well documented.

In the second section, the sample was split between those who said they currently treat TE patients, or had done so within the last year, and those who had not. This was to establish if there was a difference in practice between those currently more familiar with treating the condition and those who may not have treated it for some time.

The third section was again directed at all respondents and concerned issues around implementation of, and the potential for bias against, new energy based treatments for Tennis Elbow.

**Analysis**

With the study being exploratory in nature and data capture being categorical, only percentage response rates to each question have been analysed.

**Results**

Two hundred and fifty three physiotherapists responded to the survey invitation and completed the demographic section of the survey. Of the 253 respondents 215 (85%) reported to currently treat or have treated TE within the last year and 207 (96.3%) of these went on to complete the diagnosis and management section of the survey. Of the 38 (15%) respondents who reported not to have treated TE within the last year, 33 (86.8%) completed the diagnosis and management part of the survey. Of the 240 respondents moving on to section three of the survey 236 (98.3%) completed the final section.

**Section One – Demographics**

The majority (69.6% n=176) of respondents had been qualified for 0-15 years with only 11.9% (n=30) being qualified for more than 25 years. The majority of respondents were aged between 31-40 making up 49.8% (n=126) of the sample, with the remaining respondents spread between the other age groups.

It was found that 56.15% (n=142) of the sample were privately employed and 38.7% (n=98) were employed by the NHS. The number of respondents employed in other categories; academic, self-employed or ‘other’, was negligible. Of the NHS respondents the most frequently reported pay scale was band 6, but there was a relatively even spread between bands 5 to 8a. Most of the respondents (89.3%, n=226) worked in an out-patient setting with negligible numbers working in other settings such as academic or inpatients.

Table one shows the results regarding how strong respondents felt the evidence was to support each of the listed treatments for TE. Strengthening exercises were, by far, the modality respondents felt had the best evidence, with 27.7% (n=70) reporting very strong evidence. Surgery, Ultrasound, and Shortwave diathermy were the modalities that attracted the least responses with only 0.4% (n=1) response each in this category. Of particular interest was the finding that 63.5% (n=161) of respondents rated the evidence for corticosteroids as moderate to very strong.

The response rates to the listed treatments were relatively evenly spread within the strong and moderate evidence categories, with the exception of ultrasound, shortwave diathermy and laser, where responses remained very low, these treatments attracting the majority of responses in the weak and very weak categories.

**Table One**

**Section Two – Diagnostic and treatment section.**

Whilst the final question in section one asked respondents to rate what they felt the strength of the evidence was regarding a list of treatments, in the diagnostic and treatment section respondents were asked to say what methods they actually used for diagnosis and treatment. Within this section, regarding the treatment of TE, the condition was split into acute and chronic, with chronic being defined as over three months of symptoms. Further to this, as physiotherapy is frequently multimodal, respondents were given the opportunity to rate both a primary and secondary means of diagnosis and treatment.

**Section Two – Results from those who currently treat or have treated TE within the last year**

**Diagnosis**

In response to the question, ‘What is the most important method you use to diagnose Tennis Elbow?’ 61.4% (n=127) of the respondents highlighted ‘History’ as the most important diagnostic strategy. The second most common response was ‘Pain on resisted tests’ with 29.5% (n=61) responses. The remaining few responses were mixed across the available options with ‘Pain on palpation’ attracting 5.8% (n=12) responses.

When asked, ‘What is the second most important method you use to diagnose Tennis Elbow?’ the response ‘Pain on resisted tests’ was cited by 50.7% (n=105) of the respondents. The second most common responses were ‘Pain on palpation’ and ‘History’, with only negligible numbers advocating other methods.

**Treatment – Chronic TE**

By far the most frequently endorsed primary treatment for chronic TE was strengthening exercises with 67.2% (n=139/207) of respondents advocating it. ‘Advice to avoid the activities that cause pain’ was the next most common response, (10.1%, n=21/207). ‘Other’ non-specified treatments was the next most endorsed category with 8.2% (17/207) of responses. Within these, the mode comment was to define eccentric loading/strengthening over and above more generic strengthening activities.

The mode response for the second most useful treatment for chronic TE was ‘advice to avoid the activities that cause pain’ with 21.3% (n=44/207) responses. Strengthening exercises (18.8%, 39/207) and ‘Other’ (14%, 29/207) were the next most common responses, with the ‘Other’ free text answers varying significantly, but with education, reassurance, and advice, perhaps forming themes. The least endorsed treatments were Surgery and Short wave diathermy that gained no responses, and Ultrasound and Laser that gained a single response each.

**Treatment – Acute TE**

By far the most frequently endorsed primary treatment for acute TE was ‘Advise to avoid the activities that cause pain.’ with 49.3% (102/207) of respondents choosing this treatment. The next most endorsed treatment was ‘Strengthening exercises’ (21.7%, 45/207). Surgery, Extracorporeal shockwave therapy and Shortwave diathermy received no responses and Laser and Ultrasound received only one response each. Again there were an appreciable amount of mixed ‘Other’ responses, (8.7%, 18/207).

The intervention most frequently cited as the second most endorsed treatment for acute TE was strengthening exercises (34.3%, 71/207). ‘Advise to avoid the activates that cause pain’ was the second most endorsed treatment (14.5%, 30/207). Consistent with the other sections, Surgery, Laser, Ultrasound, Shortwave diathermy, and Extracorporeal shockwave therapy received zero or one endorsement.

**Section Two – Results from those who have not treated Tennis Elbow in the last year or more**

**Diagnosis**

When asked, ‘What is the most important method you think you would use to diagnose Tennis Elbow?’ 48.5% (n=16/33) of the respondents rated ‘History’ is the most important method of diagnosis. The next most common response was ‘Pain on resisted tests’ with 27.3% (n=9/33) responses. Pain on palpation and imaging attracted the remaining responses.

The mode response to the question, ‘What is the second most important method you think you would use to diagnose Tennis Elbow?’ was ‘Pain on resisted tests’ which attracted 42.4% (n=14/33) responses. The next most common responses were ‘Pain on palpation’ (27.3%, 9/33) and ‘History’ (21.2%, 7/33). The remaining responses advocated ‘Pain on stretching’.

**Treatment – Chronic TE**

The two most frequently endorsed primary treatments for chronic TE, both attracting the same numbers, were ‘Strengthening exercises’ and ‘Advice to avoid the activities that cause pain’ with 27.3% (n=9/33) responses. ‘Advice on stretching’ was the next most common response with 15.5% (n=5/33) responses.

The mode response for the second most useful treatment for chronic TE was ‘strengthening exercises’ with 27.3% (n=9/33) responses. ‘Advice on stretching (21.2%, 7/33) and ‘Advice to avoid the activities that cause pain, 9.1% (n=3/33) were the next most common responses.

**Treatment – Acute TE**

By far the most endorsed choice for the first line treatment of acute TE was ‘Advice to avoid the activities that cause pain’ with 63.6% (n=21/33). The next most popular options were ‘NSAIDS’ with 12.1% (n=4/33) with ‘Strengthening’ and ‘Stretching’ both scoring 6.1% (n=2/33).

The mode response for the second most useful treatment for acute TE was ‘NSAIDS’ with 24.2% (n=8/33) responses. ‘Bracing/Taping’ (18.2%, 6/33) and ‘Advice to avoid the activities that cause pain, (15.2% n=5/33) were the next most common responses.

**Section Three – Implementation of and bias towards new treatments**

The first question in this section briefly described Actisound, a new form of energy based treatment for TE. The question then reported that it is known, anecdotally, that some physiotherapists may feel bias against such treatments due to the poor evidence found regarding other/similar energy based treatments in the past. The question then asked if, even under research circumstances, respondents felt they might have a bias against a treatment like Actisound. The question implied that bias could affect factors such as the attitude and communication of the therapist and potentially affect treatment outcomes. It was found that 33.5% (n=79/236) of respondents felt they might be biased against the new treatment described.

The next question asked if a new treatment had some robust clinical research evidence if the respondents would consider using it. The two most endorsed answers were, ‘If the research methods used in the trial were of high quality (36.9%, n=87/236), and ‘I would use a new treatment if it had some up to date evidence’ (33.1%, n=78/236). A smaller number of respondents (11.9%, n=28/236) reported they would want a systematic review of the treatment before using it but only one participant (0.4%) said they wouldn’t want to use it until the treatment ‘had been around for several years’.

The final question asked if participants would use the new treatment on different tendinopathies if they had found it to be effective with TE, 52.5% (n=124/236) said they would. The rest of the responses were relatively evenly split between wanting some research evidence for each specific tendinopathy, wanting to know the treatment was safe for each specific condition, and wanting to know that others were using it for those conditions.

**Discussion**

The sample gained was of at least adequate size and very similar in number to another recent survey of physiotherapy practice in Plantar fasciitis [16]. The sample was very dominantly of those working in an outpatient setting, with a split between private and NHS contexts, and therefore appropriate to the purpose of the survey. There was a good mix of age and experience within the sample. Although the survey hoped to compare the opinions of those currently treating and not treating the condition, only a small number of respondents weren’t currently treating TE.

There were quite mixed responses to the question asking respondents to rate the level of research evidence behind a list of possible treatments for TE. Although the NICE CKS concludes there is no strong evidence for any treatment for TE, and only weak evidence for the most commonly used treatments, many respondents rated multiple treatment modalities as having moderate or strong evidence, particularly strengthening. Although very few respondents thought there was ‘very strong’ evidence for the vast majority of listed modalities, almost 30% thought this was the case for strengthening. Despite limited evidence for the use of NSAID’s in TE and concerns over safety [17] these were advocated in the acute stage as both a first line (12.1%) and second line (24.2%) treatment by sample.

There appears to be a significantly tendency for physiotherapists to overestimate the power of the research evidence regarding TE, and therefore potentially other similar conditions. Despite this however, the previously commonly used energy based modalities listed including Ultrasound, Laser and Shortwave Diathermy, largely weren’t thought to have any moderate or strong evidence. Extracorporeal Shockwave therapy, a comparatively new energy based treatment , was thought to have some moderate and strong evidence despite NICE guidance (IPG313, 2009) concluding “this procedure should only be used with special arrangements for clinical governance, consent and audit or research.” These results largely confirm the suggestion that within a UK population of Physiotherapists, traditional energy based treatments such as Ultrasound, may have a bad reputation.

From a diagnosis and treatment perspective the results of the survey are encouraging. In the absence of any high quality research literature on the subject of TE, those treating the condition are obliged to use what literature there is, and take into account standards and guidelines on the subject developed by experts in the field, such as Clinical Knowledge Summaries published by NICE. The NICE CKS (2017) on the subject of TE suggests that physiotherapy may provide some relief and that strengthening and stretching exercises may be useful. The CKS does not suggest referral for surgery, points out the risks of injections and, within the suggestion regarding physiotherapy, states the lack of evidence around modalities such as Ultrasound. Largely, the survey results, as far as treatment is concerned, appear to show that physiotherapist practice is predominantly evidence based.

Perhaps the most novel and interesting results of the survey surround the self-reported incidence of bias against new/emerging energy based treatments such as Actisound. Hypothetically, even in an anonymous survey, it may be reasonable to suggest that respondents might not wish to admit to potential bias. Despite this, a third of respondents reported they could be biased against a new treatment, even under research circumstances. There is increasing evidence that non-specific therapist effects such as attitude, verbal and non-verbal and communication, may directly affect treatment outcomes [15]. In this case, research trials should consider specifically assessing the potential for bias within clinician populations delivering research modalities, in case such bias affects results, reflecting reputation and opinions regarding a treatment, as opposed to its treatment specific efficacy.

Limitations

Although the study sample size is adequate, and similar to other related studies, the results cannot necessarily be assumed to reflect national opinions and practice. It is also impossible to rule out responder bias with the possibility that therapists interested in the subject of the survey, and therefore perhaps more up to date with the literature, were more likely to complete it.

Recommendations for Future Study

Larger studies more able to generalise findings to the population nationally would be beneficial. Also having identified “bias” as a potential factor in not only the use of new treatments, but also in there research, this issue would certainly benefit from much more specific examination. Although longer surveys often suffer from less recruitment future surveys would benefit from more a higher number of more detailed questions to avoid assumptions having to be made about issues such as what constitutes strengthening for example.

Ethical approval – As an anonymous staff survey HRA guidelines confirm ethical approval and informed consent are not necessary.

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Conflict of Interest – Neither author declares any conflict of interest.

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| Treatments for tennis elbow with reported evidence levels of effectiveness  Number of valid responses (n=253) | Very Strong Evidence | Strong Evidence | Moderate Evidence | Weak  Evidence | Very Weak Evidence |
| Advise to avoid the activities that cause the pain | 7.51 | 29.64 | 33.60 | 22.53 | 6.72 |
| Soft tissue mobilisations/frictions | 1.58 | 7.51 | 24.51 | 47.43 | 18.97 |
| Mulligans MWM | 1.58 | 7.51 | 32.02 | 45.85 | 13.04 |
| Strengthening exercises | 27.67 | 39.92 | 28.06 | 3.95 | 0.40 |
| Advise on stretching | 5.53 | 20.55 | 36.36 | 32.4 | 5.14 |
| Ultrasound | 0.40 | 1.98 | 8.70 | 43.08 | 45.85 |
| Shortwave Diathermy | 0.40 | 0.40 | 2.77 | 30.04 | 66.40 |
| Laser | 0.79 | 0.79 | 4.35 | 40.32 | 53.75 |
| Extra-corporeal Shockwave Therapy | 0.79 | 12.25 | 32.41 | 32.02 | 22.53 |
| Steroid Injection | 1.58 | 18.97 | 42.29 | 24.11 | 13.04 |
| NSAIDS | 1.98 | 20.55 | 36.36 | 32.02 | 9.09 |
| Bracing/Taping | 1.19 | 12.65 | 39.92 | 37.55 | 8.70 |
| Surgery | 0.40 | 4.74 | 30.43 | 48.62 | 15.81 |

**Table One**

**Figures are presented as a percentage (%) of the valid responses (n=253)**