Getting Evidence into Clinical Practice: SWT and Tennis Elbow
Musculoskeletal Research Facilitation Group (CAT Group)
Date: 6.9.17

Specific Question:

What is the clinical effectiveness of extracorporeal shock-wave therapy (SWT) in managing chronic tennis elbow?

Clinical bottom line

There is no high quality evidence to support the use of shock-wave therapy in the management of chronic tennis elbow. The majority of studies are of poor quality involving small numbers. There was no consistency in the findings between studies.

In 2009 NICE reported that shock-wave therapy had insufficient evidence to support its use. Studies completed since NICEs publication do not show anything to suggest that this has changed.

Why is this important?

Tennis elbow (also known as lateral epicondylosis) is a common musculoskeletal disorder with a UK point prevalence of 1.2 (Walker-Bone et al. 2004). In many cases tennis elbow is self-limiting, with reports that 83-90% of cases resolve within one year (Smidt et al., 2006; Bisset et al., 2007). In cases where tennis elbow is persistent it can be a disabling condition affecting an individual's function and wellbeing (Bot, 2005). In these instances, patients might be referred to physiotherapy.

Extracorporeal shock-wave therapy (ESWT) is an intervention that has been advocated for the management of tennis elbow. A review in the UK by the National Institute of Clinical Excellence (NICE, 2009) reported that ESWT is a safe intervention for this condition, but has insufficient evidence to support its efficacy due to inconsistent findings in the research. More recently, it has been suggested that new evidence is available that might support the use of ESWT in the management of tennis elbow (Thiele et al., 2015). The physiotherapy department at Queen's Hospital, Burton were considering purchasing a shock wave therapy machine, however the cost for both the purchase and ongoing servicing are high. It was unknown whether additional research published since the NICE review would support the effectiveness of using ESWT in tennis elbow. This Critically Appraised Topic (CAT) was conducted with the aim to help decide whether the purchase of a shock wave machine would be clinically and economically viable.

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Search timeframe (e.g. January 2009- September 2017)

Inclusion Criteria

	Description	Search terms (In the final document this should be a combination of your clinical and librarian search terms)
Population and Setting	Adults (18 years or over) with chronic (more than three month history) of tennis elbow	Tennis elbow, lateral epicondyl*, common extensor tendin*
Intervention or Exposure	Extracorporeal shock wave therapy	Shock wave therapy, SWT, Extracorporeal shockwave, ESWT
Comparison, if any	Placebo, control, comparative intervention	*(no search terms used for this category)*
Outcomes of interest	Pain Function Cost	*(no search terms used for this category)*
Types of studies	RCT, SR, Cohort	Randomi* controlled trial, RCT, Randomi* trial, systematic literature review, SLR, cohort.

Routine Databases Searched

The,Cochrane Library (n=2),Medline (n=2),Cinahl (n=1),Embase (n=3),Pub med (n=2).
Total papers found n=10. Of these 2 were duplicates.

Date of search- 6th September 2017

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Results of the search

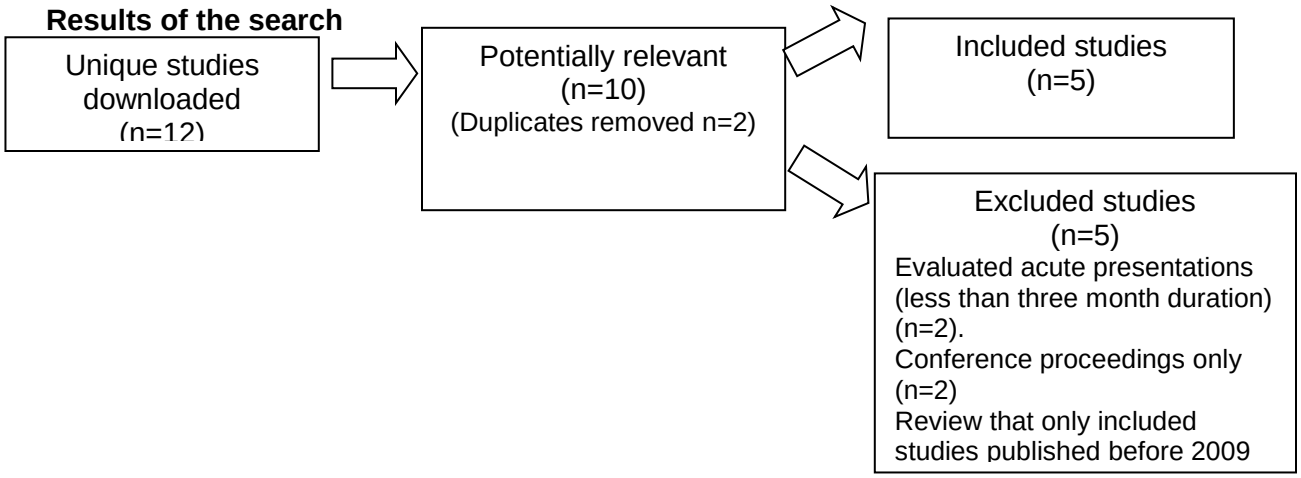

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Table 1- Detail of included studies

First Author, year and type of study	Population and setting	Intervention or exposure tested	Study results	Assessment of quality and comments
*Ozturan et al. (2010) RCT	Patients (n=60) More than six month duration. Unclear setting. Turkey.	**Experimental group:** ECST (3 sessions of 2000 impulses per session, once a week over 3 weeks) v **Comparator group 1**: Autologous blood injection (2ml) (up to 2 injections over 6 weeks) v **Comparator group 2:** Local steroid injection (anaesthetic and steroid) (2ml) (up to 2 injections over 6 weeks)	**Pain (VAS-Thomsen provocation test):** No between-group differences at 4, 12 and 26 week follow-up ($p>0.05$). **Function (Upper extremity functional scale):** No between-group differences at 4 and 12 weeks between any group ($p>0.05$), but a between-group difference was reported at 64 weeks favouring the ESWT (experimental) group to the steroid group ($p<0.001$). **Cost:** No reports on cost-effectiveness	**Positive comments:** Comparable groups at baseline. Low drop-out rate (5%) **Negative comments:** No details of whether patients or assessors were blinded potentially leading to bias. Randomisation procedure not described. No mention of intention to treat analyses- unclear how missing data was accounted for. No sample size calculation. Small sample size.
*Sarker et al. (2013) RCT	Patients (n= 30) More than six month duration. Unclear	**Experimental group:** ECST (3 sessions of 2000 impulses per session once a week over 3 weeks) with supervised exercises v **Control group**	**Pain (VAS):** Between-group differences at 4 week follow-up ($p<0.025$) favouring the ESWT group **Function (DASH):** Between-group differences at 4 week follow-up ($p<0.025$) favouring the ESWT group	**Positive comments:** Comparable groups at baseline. Adequate randomisation. No drop outs or cross-over. **Negative comments:** Neither patients nor assessors blinded No sample size calculation. Small sample size

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	setting. Hong Kong.	Supervised exercises in isolation		
Sims et al. (2014) SR	Patients with lateral epicondylitis. Searched 'earliest records to Feb 2013'	58 studies included. 8 trails on ESWT	Narrative synthesis of results Only two of the 8 studies reported finding supportive of ESWT. Authors concluded that there was no convincing evidence to support the use of ESWT over placebo	**Positive comments:** Assessed quality according to randomisation, blinding outcomes measures and loss to follow up. **Negative comments:** No tool was used to assess quality of studies Narrative review, no meta-analysis.
Capan et al. (2016) RCT	Patients (n=56) More than three month duration. Unclear setting. Turkey	**Experimental group:** Radial ESWT (3 sessions of 2000 impulses per session, once a week over 3 weeks) v **Control group:** Sham ESWT	**Pain (VAS):** No between-group differences at 1 and 3 month follow-up ($p>0.05$). **Function (PRTEE):** No between-group differences at 1 and 3 month follow-up ($p>0.05$). **Cost:** No reports on cost-effectiveness	**Positive comments:** Comparable groups at baseline. Adequate randomisation. Patients and assessors blinded. **Negative comments:** Greater than 20% drop out rate. Per-protocol analysis- excluded drop-outs. No sample size calculation. Small sample size. Only short to medium term follow-up periods.
Yang et al. (2017) RCT	Patients (n=30) More than three month duration. Outpatient department. Taiwan	**Experimental group:** Radial ESWT (3 sessions of 2000 impulses per session, once a week over 3 weeks) with PT programme (US, TENS and exercise) v **Control group:** Sham ESWT with PT programme (US, TENS and exercise)	**Pain (VAS)**: No between-group differences at 6 week and 12 week follow-up ($p>0.05$), but a between-group difference was reported at 24 weeks favouring the ESWT (experimental) group (95%CI -2.99 to -0.54). **Function (DASH):** There were between-group differences at all follow-up time points favouring the ESWT group ($p<0.05$). **Cost:** No reports of cost-effectiveness	**Positive comments:** Comparable groups at baseline. Adequate randomisation. No drop outs or cross-over. Patients blinded (patients completed outcome measures). **Negative comments:** No sample size calculation. Small sample size

Key: DASH= Disability of arm shoulder and hand questionnaire; ESWT= Extracoporeal shock wave therapy; PRTEE= Patient-rated tennis elbow evaluation; PT= physiotherapy;TENS= transcutaneous electrical nerve stimulation; US= therapeutic ultrasound; VAS= visual analogue scale).

Footnote: Ozturan et al.(2010) and Sarker et al. (2013) were not included in the review by Sims et al., 2014 and therefore were retained for This critically appraised topic.

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Summary

There have been few published studies on the efficacy of managing chronic tennis elbow with ESWT since the NICE guidance in 2009. Of the studies published and included in this critically appraised topic, all have important methodological limitations: none of the studies were powered to identify meaningful or statistically significant between-group differences. The sample sizes were small making it probable that they were underpowered which could have led to a type II error. In addition there is a lack of consistency with the results between studies in both the short and medium term. None have reported on cost-effectiveness.

Implications for Practice/research

The results of this critically appraised topic are consistent with previously reported NICE evidence (2009). Based on the available current research there remains insufficient evidence that shock wave therapy is effective for chronic tennis elbow. For this reason the recommendation is to not proceed with the purchase of a shock wave machine as the unknown quantity of clinical benefit cannot justify the additional cost of the device.

What would you tweet? (140 characters)

There remains insufficient evidence to support the use of shock wave therapy for chronic tennis elbow.

References

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