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# A Systematic Review and Meta-analysis Comparing the Efficacy of Extracorporeal Shockwave Therapy to Pulsed Radio Frequency in Reducing Hemiplegic Shoulder Pain in Post-Stroke Patients

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# A Systematic Review and Meta-analysis Comparing the Efficacy of Extracorporeal Shockwave Therapy to Pulsed Radio Frequency in Reducing Hemiplegic Shoulder Pain in Post-stroke Patients

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## OBJECTIVES

- To date there are no systematic reviews or meta-analyses comparing the efficacy of extracorporeal shockwave therapy (ESWT) to pulsed radio frequency (PRF) in treating hemiplegic shoulder pain in post-stroke patients.
- The objective of our study is to compare the efficacy of ESWT to PRF in treating hemiplegic shoulder pain in post-stroke patients, 1 month post-intervention.

## BACKGROUND

- Stroke was the fifth leading cause of death in the United States in the year 2023
- Hemiplegic shoulder pain is a common complication in post stroke patients with 80-84% prevalence
- Two non-invasive treatment modalities that aim to reduce hemiplegic shoulder pain in post stroke patients include:
  - Extracorporeal shockwave therapy ESWT
    - High energy shock waves directed to shoulder
    - Aims to improve blood flow, and tissue repair
    - has been shown to reduce inflammation and pain
  - Pulsed Radiofrequency PRF Therapy:
    - Deliver short bursts of radiofrequency energy directly to nerves and muscles
    - No heat generated during procedure thus it does not elicit tissue damage
    - Commonly used to treat nerve related pain
- Assessment of efficacy of ESWT vs PRF is necessary and has not been described to this date
- A systematic review was conducted to compare the efficacy of both techniques in treating hemiplegic shoulder pain in post stroke patients, 1 month post-treatment.

## REFERENCES

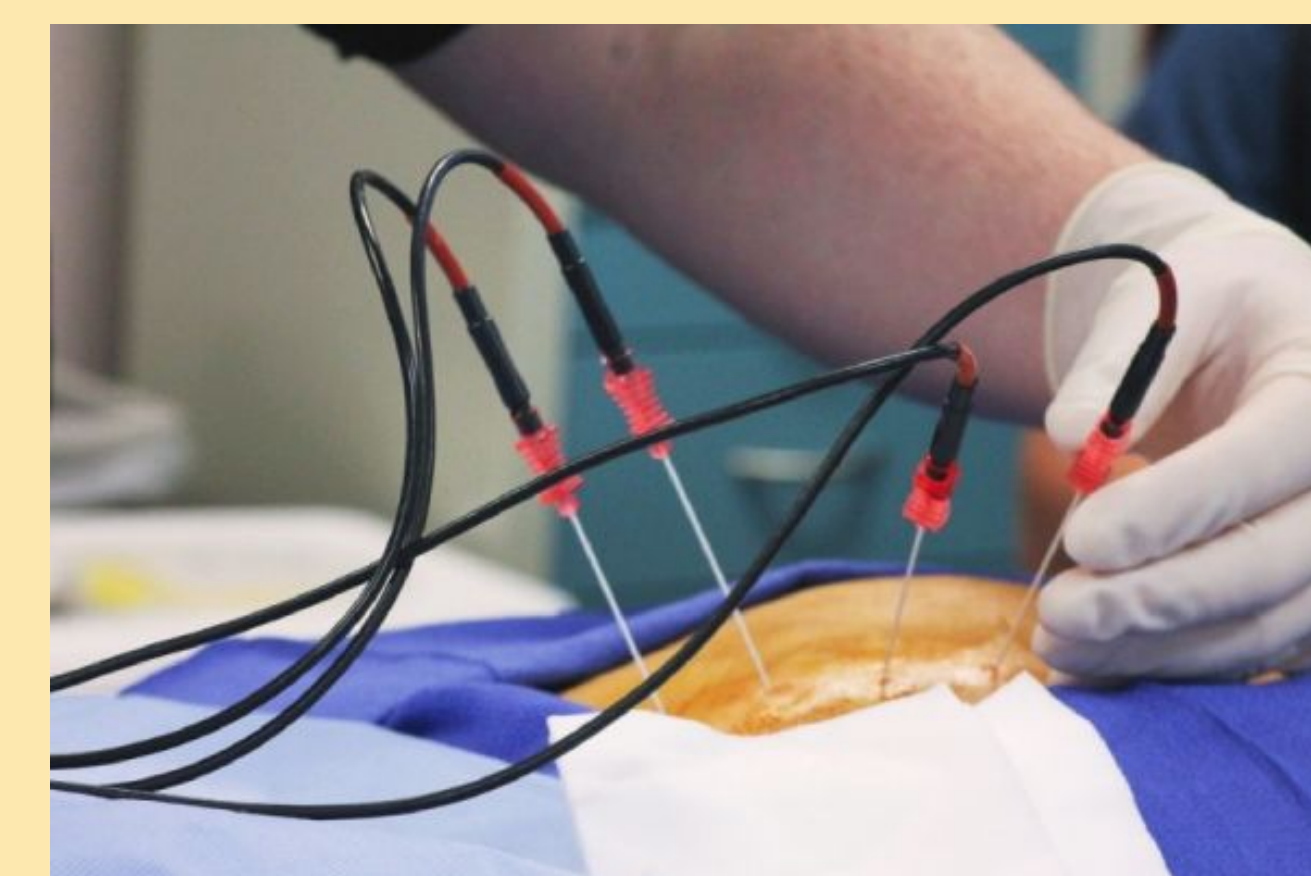


## METHODS

- A systematic review and meta-analysis was conducted as per PRISMA 2020 guidelines
- 5 Databases were screened for relevant literature
  - PubMed N = 10
  - Embase N = 9
  - Web of Science N = 14
  - Scopus N = 9
  - Cochrane N = 11
- Inclusion criteria:**
  - Randomized controlled trials (RCT) and prospective studies involving ESWT or PRF
  - Treatment timeline was up to 1 month
  - Studies reported Visual Analogue Scales (VAS) or Numerical Rating Scales (NRS)
- Exclusion criteria:**
  - No stroke or hemiplegic shoulder pain
  - VAS or NRS not included in the study
  - Incorrect timeline
- Number of articles screened:** 53
- Studies included in the final analysis:** 5
- Number of patients represented (N):** 84
- Boolean Search String:** ("Extracorporeal shockwave therapy" OR "ESWT" OR "Pulsed radiofrequency" OR "PRF") AND ("Stroke") AND ("Shoulder Pain")
- Statistical software:** SPSS
- Subgroup analysis:** 1-month post-intervention VAS scores comparing ESWT to PRF
- Graph:** Forest plot

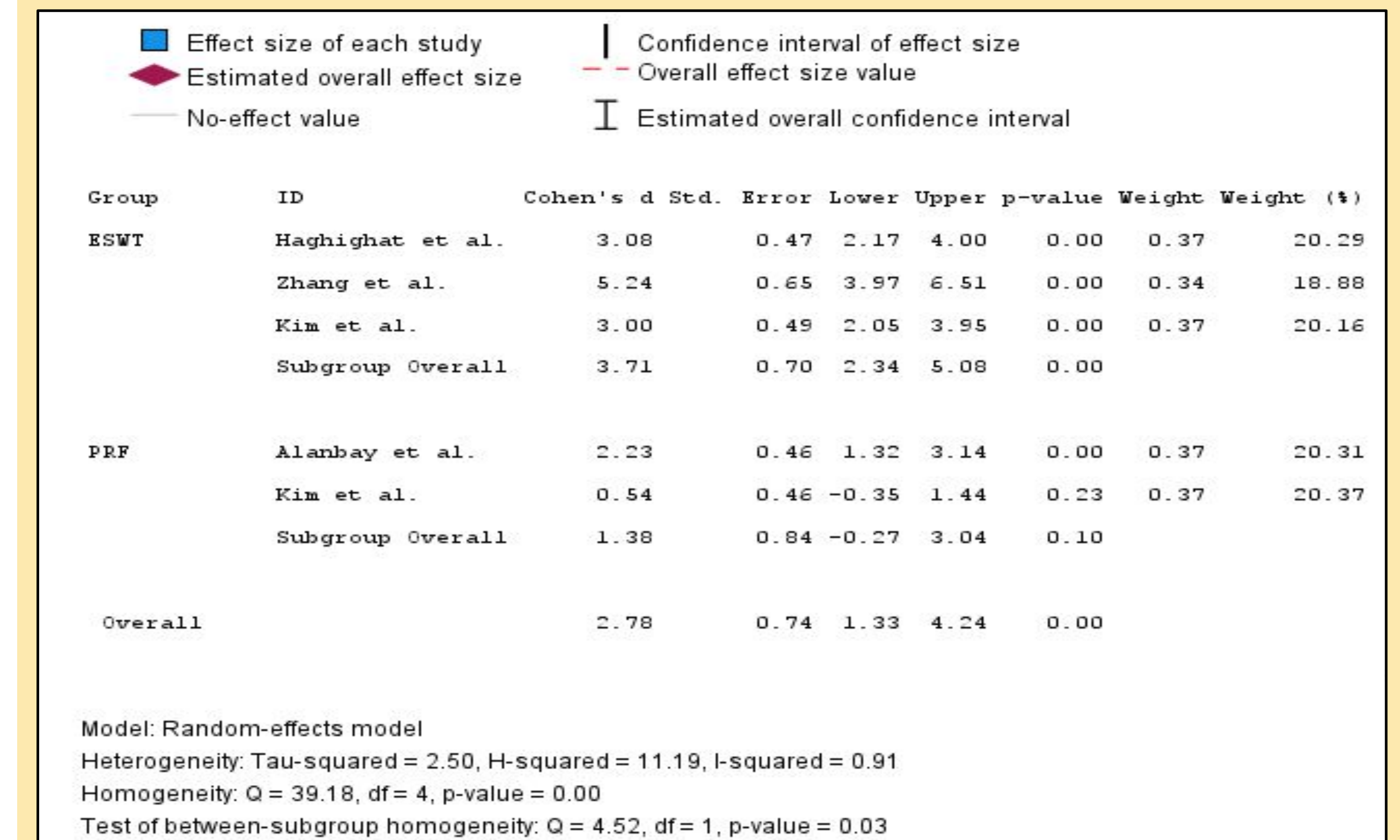


**Figure 1.** Extracorporeal shockwave therapy

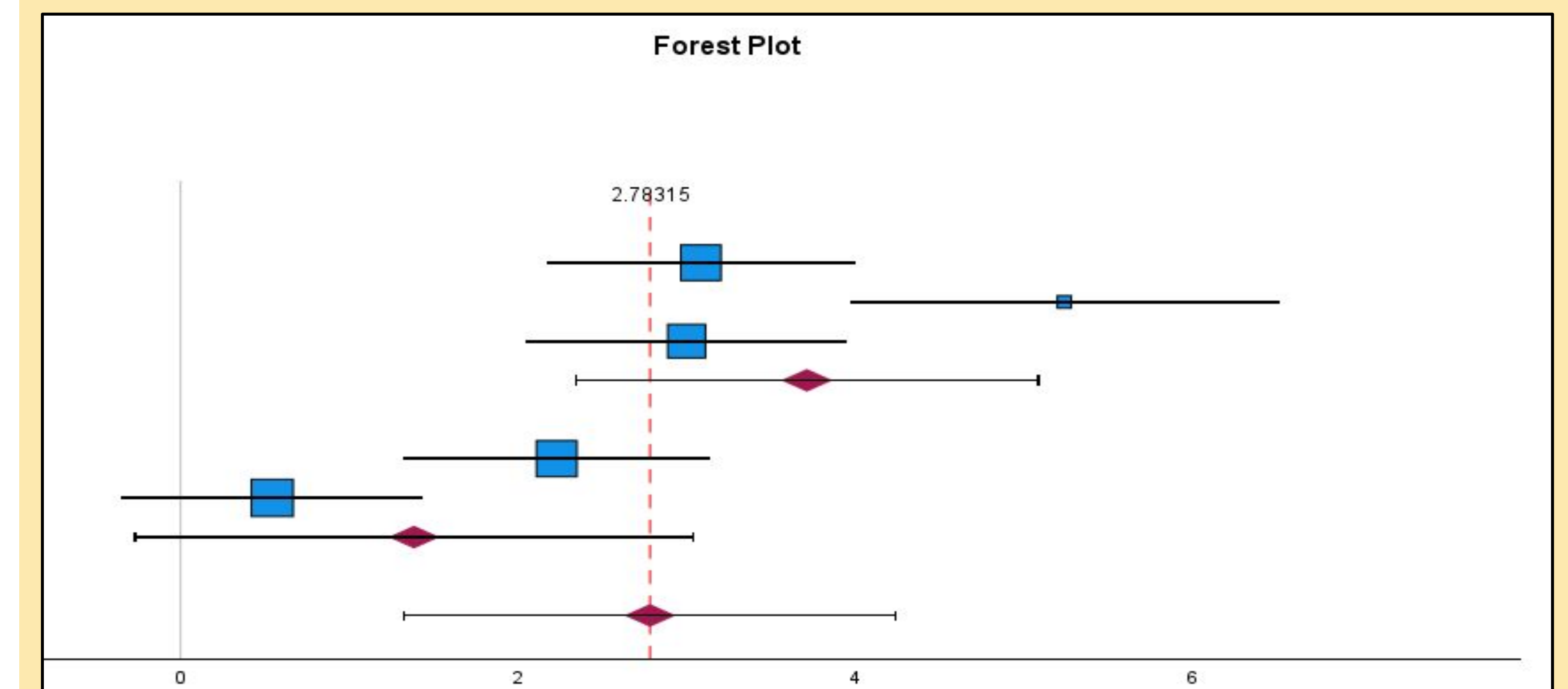


**Figure 2.** Pulsed radiofrequency

## RESULTS



**Figure 3.** The subgroup analysis 1-month post-intervention VAS scores comparing ESWT to PRF



**Figure 4.** Forest plot portraying the individual effect size of the studies, effect size for each intervention, and the overall effect size.

## CONCLUSION

- ESWT is more successful than PRF at treating hemiplegic shoulder pain, 1 month post-treatment
- VAS scores were significantly lower for patients receiving ESWT
- Larger randomized control trials comparing the efficacy of ESWT to PRF treatment are needed.
  - Placebo vs PRF vs ESWT
- Addition of more time points are needed to solidify our findings for clinical use
  - 1 month
  - 6 months
  - 1+ years