Table 1: Summary of Findings from Studies that were not included in the network meta-analysis

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Treatment Comparison | Trials/  Population | Estimates of treatment effects | | Comment/quality of evidence |
| Pain | Function |
| ESWT v placebo | **11 trials:**  Gerdesmayer 2008  Gollwitzer 2015  Gollwitzer 2007  Ogden 2004  Rompe *1996*  Speed 2003  Haupt/Straub 2002  Malay 2006  Cosentino 2001  Marks 2013  Marks 2008 | **Short term**: evidence not available in 8 trials. 2 trials, found ESWT statistically significantly superior to placebo, with mean resting heel pain (VAS) of 4.49 compared to 15.23 (p† < 0.01) (t=6 weeks)/ 6.0 compared to 8.3 (note: figures estimated from graphs) (p† < 0.0001) (t=4 weeks). 3rd trial found no statistically significant difference between ESWT and placebo, with mean change in heel pain compared to baseline (visual analogue scale) of -2.23 compared to -2.12 (p† = 0.79, two-sided) (t=4 weeks)  **Medium term**: evidence not available in 4 trials.  3 trials found no statistically significant difference between ESWT and placebo, e.g., % success rate\* for first steps pain (VAS) 60.80% compared to 48.31%/ *37% compared to 36% (t=3 months)*  4 trials found ESWT statistically significantly better than placebo, e.g., mean change in heel pain compared to baseline (VAS) of -3.39 compared to -1.78 (p† < 0.001, two-sided) (t=3 months) and mean heel pain (VAS) of 3.43 compared to 4.28 (p† = 0.014) (t=3 months)/ 4.0 compared to 8.5 (note: figures estimated from graphs) (p† < 0.0001) (t=3 months). \*Dichotomous outcomes: % success rate\* of 50.4% compared to 36.4% (p† = 0.0136, one-sided) (t=3 months)  *\*success rate defined by >60% decrease in visual analogue score compared to baseline*  **Long term**: evidence not available in 4 trials: Rompe 1996 did not report placebo outcome and p value not reported so cannot compare.  2 trials found no statistically significant difference between ESWT and placebo e.g., mean change in pain (VAS); ESWT, -28.25 (26.06); placebo, -1.78 (44.42) (t=6 months)  3 trials found ESWT better than placebo, with e.g., % success rate\* of 61.60% compared to 47.46% (p† = 0.0144, one-sided) (t=12 months); mean morning heel pain (VAS) of 1.41 compared to 3.54 (t=12 months)/ 1.5 (1.7) compared to 4.4 (1.7) (p† < 0.0001) (t=12 months) and 3.3 (0.8) compared to 4.7 (0.8) (t=12 months) | **Short term**: No evidence  **Medium term**: No evidence in 9 trials  2 trials found ESWT to be better than placebo. E.g., % “excellent” or “good” (RMS) of 58.40% compared to 41.52% / 60.8% compared to 37.2% / 60% compared to 40% (t=12 weeks).  1 trial found ESWT better than placebo based on mean values at follow up: 90.4 (8.3) compared to 75.4 (17.3) (p† = 0.0211) (t=12 months) on AOFAAS scale\*\*  *\*\* AOFAAS scale- American Orthopaedic Foot and Ankle Society’s Ankle-Hindfoot Scale: higher scores indicate greater functional ability* | Uncertainty in evidence across trials and time points. ESWT appears better than placebo.  Trials assessed as mostly unclear and high risk of bias on assessment. |
| Exercise v ESWT | **1 trial:**  $Rompe 2010 | **Short term**: No evidence  **Medium term**: Exercise found to be better than ESWT, mean change in first step pain: -4.5 (2.4) compared to -1.8 (2.0) (t=2 months)  **Long term**: No statistically significant difference between exercise and ESWT, mean change first step pain: -5.8 (2.3) compared to -5.9 (2.6) (t=15 months). | **Short term**: No evidence  **Medium term**: Exercise better than ESWT, mean change in first step pain: -21.4 (10.6) compared to -6.6 (1.2) (p† < 0.001, t=2 months)  **Long term**: No statistically significant difference between exercise and ESWT, mean change first step pain: -29.1 (12.8) compared to -28.9 (12.3) (p† = 0.950, t=15 months) | Exercise appears to confer more benefits compared to ESWT in the medium term. Beneficial effects was not sustained in the longer term?  Uncertain evidence from only 1 trial  Unclear risk of bias on most ROB items. |
| Custom orthosis v prefabricated orthosis/placebo | **2 trials:**  Martin 2001  Wrobel 2015 | **Short term**: 1 trial found no difference the mean first step pain score among for custom orthosis, 3.4; prefabricated orthosis, 3.9; placebo, 3.6. (p† < 0.65; t=4 weeks)  **Medium term**: the 2 trials found no difference between custom orthosis and prefabricated orthosis. E.g mean first steps pain: custom orthosis, 2.6; prefabricated orthosis, 2.5; placebo, 2.9 / mean change of 5.3 in both groups (t=3 months).  **Long term**: No evidence found*.* | Evidence from a single trial:  **Short term**: No statistically significant difference between custom, 62.0 and prefabricated 67.4 or placebo 59.4 orthosis (t=4 weeks).  **Medium term**: No statistically significant difference between custom, 57.2 and prefabricated 65.1 or placebo 62.4 (p† < 0.77, t=12 weeks).  **Long term**: No evidence | No difference between custom or prefabricated orthosis.  Agrees with evidence from network.  Unclear risk of bias on assessment. |
| Exercise + ESWT + prefabricated orthosis v ESWT + prefabricated orthosis | **1 trial:**  $Rompe 2015 | **Short term**: No evidence  **Medium term**: ESWT + prefabricated orthosis better with exercise than without exercise. Mean change of -4.0 (1.5) compared to -1.8 (2.0) (p† < 0.001, t=2 months)  **Long term**: Differences were not statistically significant at t=24 months. Mean change for first step pain: -5.1 (2.5) compared to -4.2 (2.5) (p† < 0.05) | **Short term: No evidence**  **Medium term:** ESWT + prefabricated orthosis better with exercise than without exercise. Mean change of -20.1 (7.8) compared to -12.2 (6.3) (p† < 0.001, t=2 months)  **Long term:** ESWT + prefabricated orthosis better with exercise than without exercise at t=24 months. Mean change : -35.8 (11.0) compared to -27.6 (13.8) (p† < 0.01) . | Uncertain evidence from only 1 trial  Unclear/low risk of bias. |
| Exercise + custom orthosis v exercise + prefabricated orthosis v exercise | **1 trial:**  Pfeffer 1999 | **Short term**: No evidence  **Medium term**: No statistically significantly difference between the interventions (p† < 0.35) mean change (95% confidence interval) for pain compared to baseline: exercise + custom orthosis, -19.0 (-29.2, -8.7); exercise + prefabricated orthosis, -23.3 (-27.9, -18.6); exercise, -15.8 (-26.4, -5.1) (t=2 months)  **Long term**: No evidence | No evidence for function in **short, medium or long term** follow up | Uncertain evidence from only 1 trial.  Unclear/high risk of bias |
| Steroid injection v prefabricated orthosis v steroid injection + prefabricated orthosis | **1 trial:**  Kriss 2003 | **Short term**: Based on mean change in heel pain (VAS) compared to baseline; steroid injection, -65.3 (23.7) appears better than steroid injection + prefabricated orthosis, -49.3 (31.4) or prefabricated orthosis alone -20.3 (26.1); (p† < 0.001, t=4 weeks)  **Medium term**: Based on mean change in heel pain (VAS) compared to baseline; steroid injection, -61.7 (28.2); appears better than steroid injection + prefabricated orthosis, -51.4 (31.1) or prefabricated orthosis alone -38.6 (30.6); (p† < 0.05, t=12 weeks)  **Long term**: No statistically significant difference (p† = 0.10) between the three interventions in mean change (standard deviation) in heel pain compared to baseline (visual analogue score); steroid injection, -63.7 (31.4); prefabricated orthosis, -50.6 (28.6); steroid injection + prefabricated orthosis, -61.3 (27.2) (t=6 months) | No evidence for function in **short, medium or long term** follow up | For pain only, addition of prefabricated orthosis does not confer benefits on pain reduction.  Uncertain evidence from only 1 trial.  Mostly unclear/high risk of bias on assessment. |

† *p value testing for a difference between three treatment groups (in mean change from baseline). Statistical significance level not declared.*

*$ mean change (standard deviation) in total Foot Function Index sum score compared to baseline*

Table 2: Characteristics of studies excluded from analysis n=28

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Author/ Yr** | **Country** | **Study setting** | **Diagnosis/**  **Inclusion criteria** | **Sample size** | **mean age Intervention/control arm ± SD** | **Mean Duration of symptoms (weeks)** | **Intervention description & dose /**  **No of sessions/ Duration of treatment :** | **Control description & dose /**  **No of sessions/ Treatment duration:** | **Delivered by?** | **Comments:**  **Reasons for exclusions**  **Co-interventions** |
| DiGiovanni 2003/2006 | USA | Outpatient | Proximal plantar fasciitis. Failed previous treatments | 101 | 44.6±NR   47.1±NR | Unclear | Exercise:  Plantar fascia stretching with Ten second hold and repeat 10 times x 3/ day  Duration of treatment: Unclear | Exercise:  Achilles tendon stretching: with Ten second hold and repeat 10 times x 3/ day | Patient: self-administered? | Wrong outcome data (only change scores presented, and no baseline outcomes).  Both groups received over the counter insoles, a 3-week course of NSAIDS and an educational video about plantar fasciitis |
| Dogramaci 2010 | Turkey | Secondary care | Plantar fasciitis > 6 months, | 50 | 51.8± 9.1  52.7± 7.6 | 60 | Type of shockwave? appliction of 1 000 pulses under local anaesthetic (5ml of 2% prilocaine) | Placebo:  Sham ESWT with injection of local anaesthetic only | Unclear | Wrong intervention. Classified not to be clinically like the ESWT interventions?  Patients in both groups were allowed to take analgesic medication (Paracetamol 500 mg ) three times daily for 3 days |
| Gerdesmayer 2008 | USA/ Europe | Secondary care | Plantar fasciitis  > 6 months failed previous treatments | 252 | 52.4± 12  52±10.5 | 102 | ESWT: 3 applications of 2 000 waves to the point of maximal tenderness at 0.16J/mm2 over 6 wks | Placebo: Sham ESWT, 3 applications over 6 wks | Orthopaedic surgeon or podiatrist | Wrong outcome data (only useful outcome data for extraction was for binary function). |
| Gollwitzer 2015 | USA | Secondary care | Plantar Fasciitis  > 6 months failed previous treatment | 250 | 50±11.2  47.4± 10.6 | Unclear | ESWT:  3 applications of ESWT 2 000 waves to the point of maximal tenderness at 0.25 mJ/mm2 over 3 weeks | Placebo: Sham ESWT. 3 sessions over 3 wks | Unclear | Wrong outcome data (only useful outcome data for extraction was for binary function).   All: Pts allowed up to 2g of acetaminophen |
| Gollwitzer 2007 | Germany | Secondary care | Chronic Painful Heel Syndrome  > 6 months failed previous treatment | 40 | 53.9± 12.5  58.9± 10.9 | 50 | ESWT: 3 applications of ESWT 2 000 waves to the point of maximal tenderness at 0.25 mJ/mm2 over 3 weeks | Placebo: Sham ESWT. 3 sessions over 3 wks | Unclear | Wrong outcome data (only change scores presented, and no measure of variability). All: Pts allowed up to 2g of acetaminophen |
| Greve 2009 | Brazil | Hospital/Rehabilitation | Plantar Fasciitis pain > 3 months,  fascia thickness > 4mm. | 32 | NR | NR | ESWT: 3 applications of ESWT 2 000 waves, 6Hz and pressure of 3 bar to the point of maximal tenderness at 0.25 mJ/mm2 over 3 weeks | Placebo/Usual care: 10 sessions of Physiotherapy incorporating Ultrasound (1Hz, intensity 1.2 W/cm2) and stretching over 5wks | ESWT by Physician Usual care by Physiotherapist | Early results of Grecco 2013.  All: Stretching for the calf and plantar fascia at home |
| Martin 2001 | USA? | Unclear | Plantar fasciitis | 255 | 47±13  48±11 | 20 (median) | custom orthoses:  rigid 5mm polydur plastic material | prefabricated orthoses: Over-the-counter arch supports. | Podiatrist | Wrong outcome data (only change scores presented, and no measure of variability).  All: Taping for 2 weeks using a Low Dye technique |
| Ogden 2004 | USA | Outpatient | Chronic plantar fasciitis >/6 months. Failed conservative treatments >5/10 (VAS) | 293 | Unclear | NR | ESWT:  Electrohydraulic 100 graded shocks (14 to 18 kV; 0.12 to 0.22 mJ/mm2) followed by 1400 shocks at 18 kV (0.22 mJ/mm2) for a total of 1500 shocks, applied at 2 Hz. Total energy at 324.25 J. | Placebo: SHAM ESWT with Styrofoam block  Co-intervention: | NR | Wrong outcome data (only point estimates reported, without a measure of variability).  All:  Anaesthesia with lidocaine prior to procedure  Self-treatment with over-the-counter analgesics or anti-inflammatory medications was permitted and documented |
| Porter 2002 | USA | Outpatient | Painful Heel Syndrome | 94 | 45.4±11.1  45.9±12.1 | 50/94? | Exercise: Sustained stretching of Achilles tendon 3x daily, 3 minutes for 17 weeks following 1 instruction session by physiotherapist | Exercise:  Intermittent stretching of Achilles tendon 2x daily, 20 second intervals for 3 minutes, over 17 weeks. | physiotherapist | Wrong interventions (too similar to separate into different nodes).   No other treatments |
| Rathleff 2015 | Denmark | Outpatient | Plantar fasciitis  Inferior heel pain >3 months, pain in palpation, thickness plantar fasciitis >4.0 min | 48 | 47±7  45±8 | 30 | Exercise  12 repetitions, 3 sets of high load strength training. Increasing load, with reducing no. of reps over 13 weeks | Exercise:  10 Stretching repetitions 3x per day, for 13 weeks | physiotherapist | Wrong interventions (too similar to separate into different nodes).   All: information & advice for home exercise plus gel heel inserts |
| Rome 2004 | UK | Unclear | Plantar heel pain  (Unilateral); >2 months | 48 | 61.2±14.4  58.3±12.6 | median 26 | Orthoses:  Functional foot orthoses, made of ethyl venyl acetate to achieve weight bearing realignment of foot and lower limb, redistribution of load, shock absorption in gait over 8wks | Orthoses  Accommodative foot orthoses, made of low-density ethyl venyl acetate; polyurethane heel pad to provide cushioning, padding, shock absorption over 8 wks. | Researcher | Wrong interventions (too similar to separate into different nodes).  All: written and graphic information about stretching programme |
| Rompe***1996*** | Germany | Outpatient | radiologically proven heel spur; >12 months; unsuccessful conservative or surgical in previous 6 months | 30 | 47±NR  51±NR | 78 | ESWT:  3 applications of 1000 impulses of 0.06mJ/mm, radius 1.5-2cm over 3 wks. | Placebo: 3 applications of Sham ESWT over 3 wks | NR | Wrong outcome data (only point estimates reported, without a measure of variability).   No other treatment |
| Rompe 2005 | Germany | Outpatient | chronic plantar fasciitis  moderate-severe pain; > 6 months; failed multiple conservative treatments (n=4); treatment-free interval of 6 weeks before EWST | 86 | 48±NR  50±NR | 65-74 | ESWT  3 applications of 2000 impulses of 0.09mJ/mm2 plus local anaesthetic over 3 weeks. | Placebo:  3 applications of sham EWST, without local anaesthetic in 3 weeks | physician | Wrong outcome data (only change scores presented (mean and 95% confidence interval).  rescue pain medication and insoles allowed. |
| Rompe 2010 | Germany | Outpatient | plantar fasciopathy  duration <6 weeks; NRS >6; | 102 | 53.1±NR  49.8±NR | ~3.8 | Exercise: plantar fascia specific stretching: 10 exercise repetitions at 10 sec hold interval 3 times daily. 1 instruction session, contacted by phone every 2 weeks for 8 wks | ESWT: 3 Sham shockwave device for 3 weeks | physician | Wrong outcome data (only change scores presented (mean and standard deviation).  Rescue pain medication |
| Rompe 2015 | Germany | Outpatient | chronic plantar heel pain, >12 months, at least 3 failed conservative treatments, no surgery. | 152 | 51.2±NR  52±NR | 70 - 78 | Exercise + ESWT: Plantar fascia specific stretching (10 exercise repetitions at 10 sec hold interval 3 times daily) + EWST 2000 pulses, 0.16mj/mm2  1 instruction session, contacted by phone every 2 weeks for 8 wks. | ESWT: 3 applications of 2000 pulses, 0.16mj/mm2 over 3 wks. | physician | Wrong outcome data (only change scores presented (mean and standard deviation).  All: Rescue pain medication. Heel pads and advice to continue activities as normal. |
| Speed 2003 | England | Outpatient | Plantar fasciitis (unilateral); > 3mths | 88 | 51.7± NR  52.5± NR | 60? | ESWT:  3 applications of Electromagnetic 1500 pulses at 0.12 mJ/mm2 over 8 weeks. | Placebo: 3 applications of Sham ESWT with deflated treatment minimal energy pulses (0.04 mJ/mm2 ) over 8 wks. | NR | Couldn’t extract any useful outcome data.  No other treatments allowed. |
| **Haupt/Straub 2002** | Germany | Unclear | plantar calcaneal tendoperiostitis >  At least 6 mth history, with at least 2 different unsuccessful attempts of conservative trt. | 103 | 50.46? | 96? | ESWT:  Up to 3 applications of 2000 shockwaves over 4 weeks | Placebo: Sham ESWT identical to active treatment | NR | Couldn’t extract any useful outcome data (given in the form of graphs only).  Treatments carried out with or without anaesthesia based on pt preference. |
| Kamonseki 2016 | Brazil | Unclear | Plantar fasciitis (bilateral) >30 days | 83 | 45.2± 12  44.5± 11.5 | 73.2 | Exercise: daily stretching & bi-weekly strengthening exercises for 8 wks | Exercise  Foot exercises (daily stretching exercises only). for 8 weeks. | Physiotherapist (for bi-weekly sessions. | Wrong interventions (too similar to separate into different nodes). |
| Kriss 2003 | England | Unclear | unilateral heel pain. anti-inflamm med stopped 6 weeks before inclusion. | 76 | 59.33±NR | 32.73 | Steroid Injections: 1 Triamcinolone Hexacetonide 20mg/ml. | Orthoses: Soft anti-pronatory pad | NR | Wrong outcome data (only change scores presented (mean and standard deviation).  Intervention 3: combination of steroid injection and orthoses (exactly as in interventions 1 and 2) |
| Liang 2007 | Taiwan | Outpatient | Plantar fasciitis. > 6 months, failed previois conservative treatments. >3 months since previous steroid injection (if any). | 53 | 47±11  52.1±9.7 | NR | ESWT  3 applications of Low intensity piezoelectric shockwave of 2000 impulses at 0.12 mJ/mm2 over 2 weeks. | ESWT  High intensity piezoelectric shockwave  3 applications of Low intensity piezoelectric shockwave of 2000 impulses at 0.56 mJ/mm2 over 2 weeks. | NR | Wrong interventions (too similar to separate into different nodes). |
| Lohrer 2010 | Germany | Unclear | Plantar fasciitis/ Heel spur > 3 months failed conservative trts,  VAS>5, R&M score of 3 or 4 | 39 | 45±NR  52±NR | NR | ESWT: 3 applications of 2000 Shockwave impulses (freq=10Hz), 0.20 mJ/mm2 over 2 weeks | ESWT:  3 applications of 2000 Shockwave impulses (freq=10Hz), 0.17 mJ/mm2 over 2 weeks | Physician | Wrong outcome data (only point estimates reported, without a measure of variability). |
| Malay 2006 | US | Unclear | Plantar fasciitis (proximal)  > 6 mths, failed previous conservative treatments, VAS score > 5 | 172 | 50.8±10.1  52.1±11.1 | 130 | ESWT: 1 application of 3800 shockwaves (150 shock/min). for 25 minutes. | Placebo: Sham shockwave with Foam-insulated membrane. | unblinded investigator? | Wrong outcome data (only change scores presented, and no measure of variability). |
| Pfeffer 1999 | USA? | Unclear | Proximal plantar fasciitis | 236 | 48.5± NR  49.5±NR | unclear | custom orthoses: polypropylene neutral orthosis | prefabricated orthoses: silicone heel pad | NR | Wrong outcome data (only change scores presented (mean and standard deviation).  Int 3: pre-fabricated orthoses; rubber heel cup Int 4: pre-fabricated orthoses; a felt insert All: Stretching exercises (all five groups |
| Wrobel 2015 | USA | Unclear | Plantar heel pain/plantar fasciitis < 1 yr | 77 | 47.1± NR  51.3± NR | 21 | custom orthoses: Standard prescription with accommodations for body stature, foot data, first-ray and ankle function worn for 12 wks | prefabricated orthoses: full foot–length, triplanar orthotic footbed with a 15-mm heel cup for 12 wks | senior experienced biomechanics instructor | Wrong outcome data (only point estimates reported, without a measure of variability).  Group 3: sham orthoses:  fabricated by certified pedorthist.  All treated with removable longitudinal and metatarsal pads for the 7-14 day period before orthosis arrival plus standardized athletic shoes and standardized foot self-care advice |
| Cosentino 2001 | Italy | Hospital/Rehabilitation | Calcaneal ethesophytosis  Pain over heel spur / unsuccessful conservative treatment >six months before referral to our hospital. | 60 | NR | ~34 | ESWT:  6 applications of 1200 shocks with a frequency of 120 shocks/min; at varied energy density from 0.03 to 0.04 mJ/mm2 over 8-9weeks. | ESWT:  6 applications of 1200 shocks with a frequency of 120 shocks/min; at 0 mJ/mm2 energy density? | NR | Wrong outcome data (only point estimates reported, without a measure of variability).   Only use of insole supports was permitted. |
| Marks 2013 |  |  |  |  |  |  |  |  |  | Couldn’t extract any useful outcome data (given in the form of graphs only). |
| Marks 2008 | Unclear (Poland) | Unclear | Plantar fasciitis | 25 | 51.9±11.9  51.7±14.3 | 113.2 | ESWT:  3 applications of 500 Shockwave impulses for the 1st session, then 2000 shock waves in two further sessions, at 3 days’ intervals. Energy density was 0.16 mJ/mm2. | Placebo: Sham ESWT. As intervention group but energy density reduced almost to zero | Orthopaedic surgeon | Wrong outcome data (only change scores presented (mean and standard deviation). |
| Baldassin 2009 | Brazil | Hospital/Rehabilitation | Plantar fasciitis  (non-complicated PF) | 142 | 47.5 ± 11.5  47.2 ± 12.4 | NR | Prefabricated orthoses: made from 95% EVA, worn for 8 weeks. | Custom orthoses:  Made from 95% EVA worn for 8 weeks | Principal Investigator | Wrong interventions (too similar to separate into different nodes). |

*NR: Not Reported*

*?: Data given but unclear/could not be verified*