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**Fersensporn:
„Radiotherapy first“ ...
oder gibt es „alternative Fakten“?**

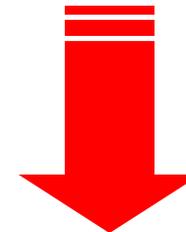
Agenda

- **Evidenz der Strahlentherapie**
- Evidenz von
Alternativmethoden
- Methoden-Vergleiche
- Die „richtige“ Methode?

Alte randomisierte Daten

- **Plenk, 1952**
 - 38 Schultern
 - Überlegenheit des RT-Armes
88% vs. 71% Besserung (n.s.)
- **Goldie et al., 1970**
 - Doppelblindstudie mit 399
Patienten, kein Unterschied
zwischen den Armen,
Ansprechrate über 60%
- **Valtonen et al., 1975**
 - Doppelblindstudie, n=104
 - Kein Unterschied zwischen den
Armen

- Klar definierte Endpunkte fehlen
- Inhomogene Patientenkollektive –
prognostisch sehr unterschiedliche
Entitäten
- Teilweise ungeeignete Entitäten
- Therapie im akuten Stadium
- Nachbeobachtungszeit teilweise zu
kurz



Trotzdem gerne zitiert, um die
scheinbare Unwirksamkeit der
Strahlentherapie zu
„beweisen“

Heyd et al, 2007

- 3Gy/0.5Gy 2x/Woche vs. 6Gy (1.0Gy 2x/Woche)
- n = 130
- Calcaneodynie – Score
- kein signifikanter Unterschied

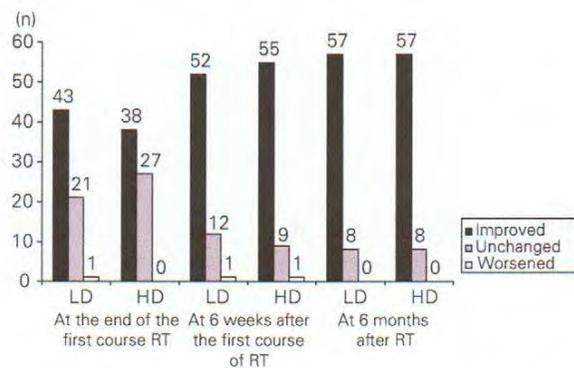


Figure 4. Variation of the sum score in both groups at several dates of examination.

Abbildung 4. Veränderung des Summscores in beiden Gruppen zu den verschiedenen Untersuchungszeitpunkten.

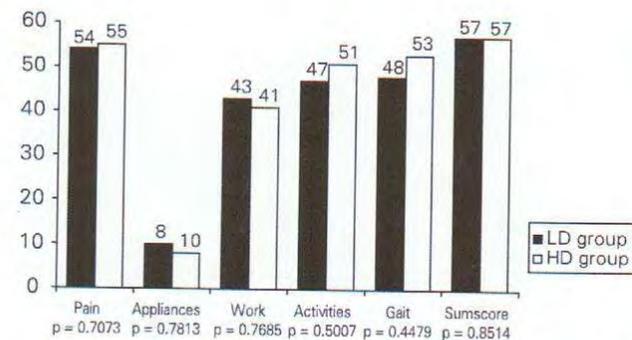


Figure 5. Improvement of the single criteria and the sum score before RT and at 6 months after RT in both groups.

Abbildung 5. Verbesserung der Einzelkriterien und des Summscores vor RT und 6 Monate nach RT in beiden Gruppen.

Niewald et al., 2012

Randomisierter Vergleich des
Effektes einer Standarddosis
(6Gy)

mit demjenigen einer
sehr geringen Dosis (0.6Gy)

Erfolgsparameter:

1. Visuelle Analogskala (VAS)
2. Calcaneodynie-Score nach Rowe
3. SF12-Bogen
 1. Fremdbeurteilung
 2. Selbstbeurteilung



Niewald et al., 2012

Besserung (Punkte)	Zahl der Patienten	Mittelwert der Differenz 0.6Gy	Mittelwert der Differenz 6.0Gy	Signifikanz $p=$
VAS-Score	59	20,0	43,4	0,001
Calcaneodynie-Score	53	24,8	35,6	0,027
SF12 körperlich Selbstbeobachtung	59	6,2	16,1	0,002
SF12 körperlich Fremdbeobachtung	53	5,6	10,7	0,049
SF12 psychisch Selbstbeobachtung	59	5,4	6,9	0,62
SF12 psychisch Fremdbeobachtung	53	0,8	4,1	0,045

Ott et al., 2013

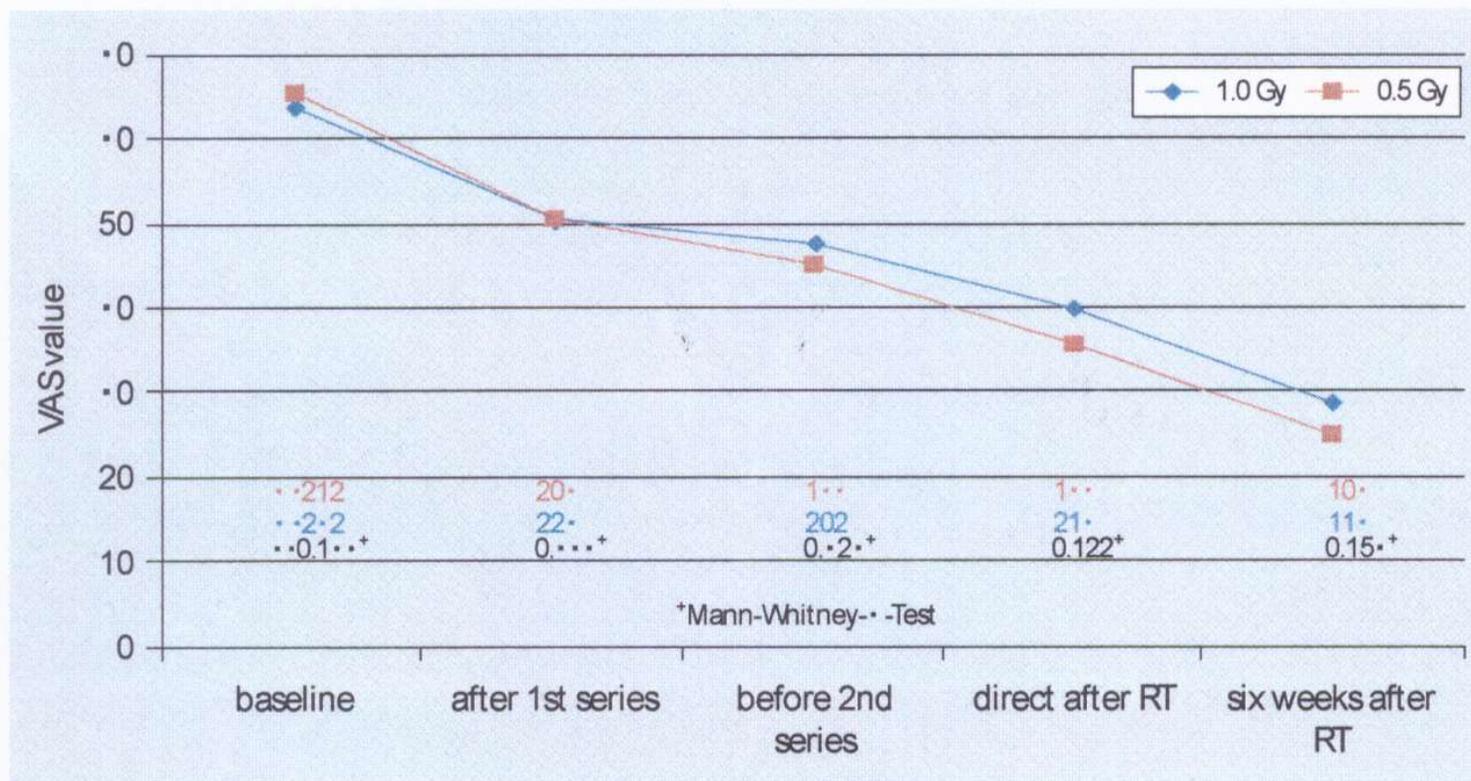
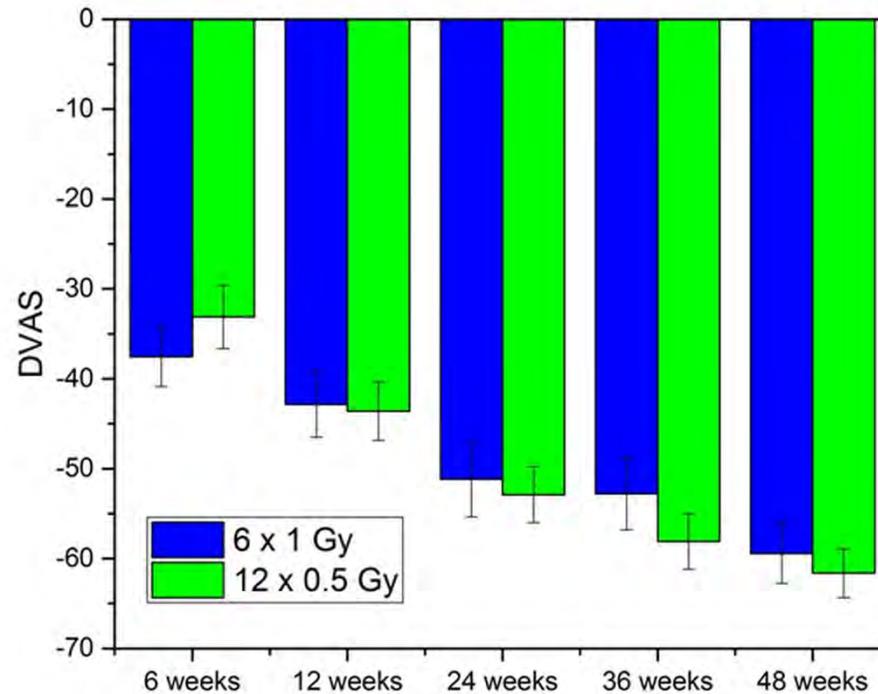


Fig. 4 ▲ Visual analogue scale (VAS) results and single fraction dose. RT radiotherapy

6 x 1.0Gy vs. 12 x 0.5Gy (Niewald et al., 2017)



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- Evidenz der Strahlentherapie
- Evidenz von
Alternativmethoden
- Vergleich mit Strahlentherapie
- Die „richtige“ Methode?

Alternativmethoden

- **22 Metaanalysen (!):**
- **Orthesen, Einlagen u.a.**
- **ESWT (Stoßwellen)**
- **Injektionstechniken**

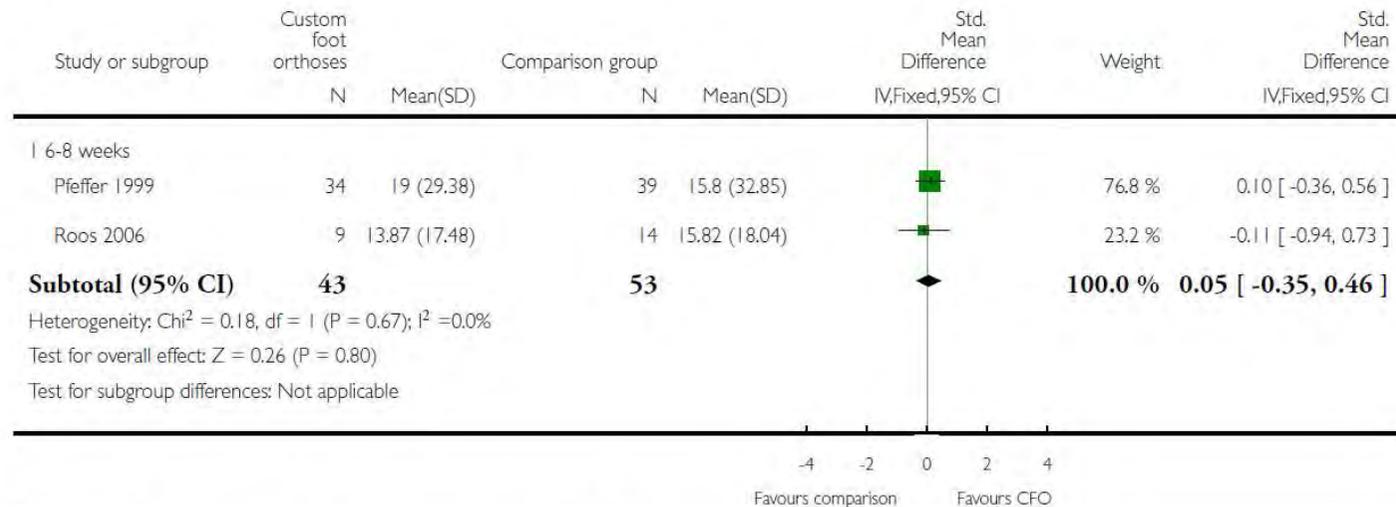
Einlagen/Orthesen: Hawke et al., 2008, Cochrane

Analysis 7.1. Comparison 7 Custom-made foot orthoses versus standardised intervention for plantar fasciitis, Outcome 1 Foot pain 6-8 weeks.

Review: Custom-made foot orthoses for the treatment of foot pain

Comparison: 7 Custom-made foot orthoses versus standardised intervention for plantar fasciitis

Outcome: 1 Foot pain 6-8 weeks



Custom-made foot orthoses for the treatment of foot pain (Review)

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Einlagen/Orthesen: Lee et al., 2008

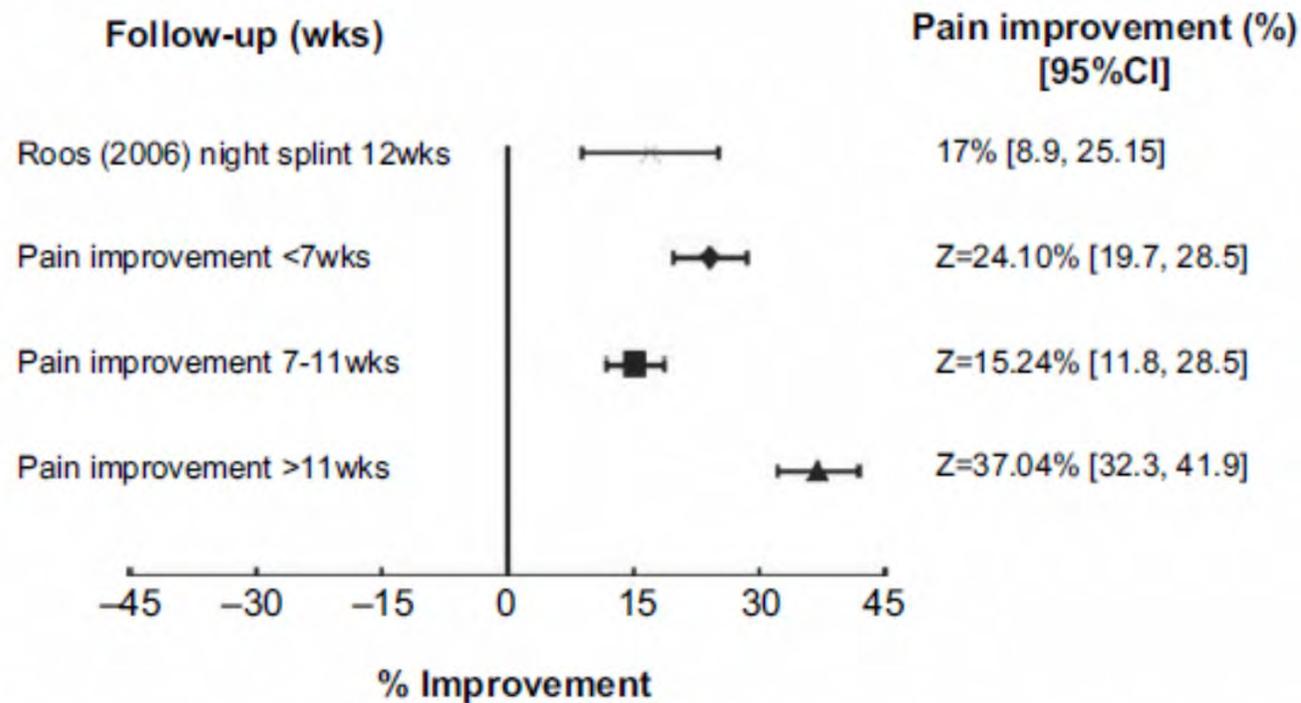


Fig. 2. Meta-analysis result of improvement of pain for different follow-up sessions. Positive indicates improvement of pain.

Alternativmethoden

- **22 Metaanalysen (!):**
- Orthesen, Einlagen u.a.
- **ESWT (Stoßwellen)**
- Injektionstechniken

Wirkungsmechanismus

- Vermehrte Neovaskularisation
- Vermehrte Freisetzung von Wachstumsfaktoren
- Vermehrte Synthese von Glucosaminglycanen und Proteinen
- Vermehrte Proliferation von Fibroblasten
- Somit Stimulation der Heilung der Sehne

- Ältere Ergebnisse:
 - Direkte Wirkung auf Nociceptoren
 - Unterdrückung der Schmerzleitung

ESWT: Dizon et al., 2013

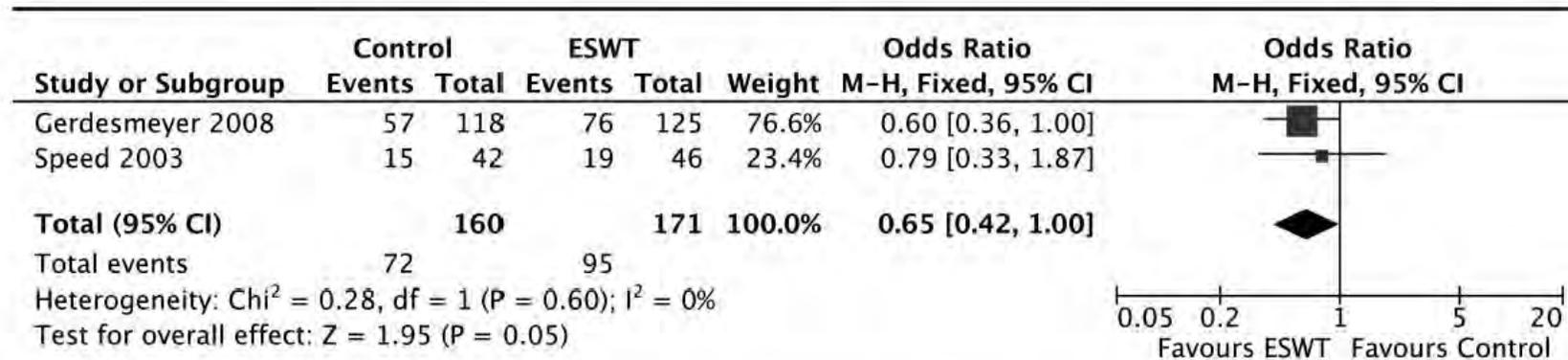


FIGURE 4 Comparison of morning pain between the experimental and control groups in using moderate-intensity ESWT.

ESWT: Lou et al., 2016

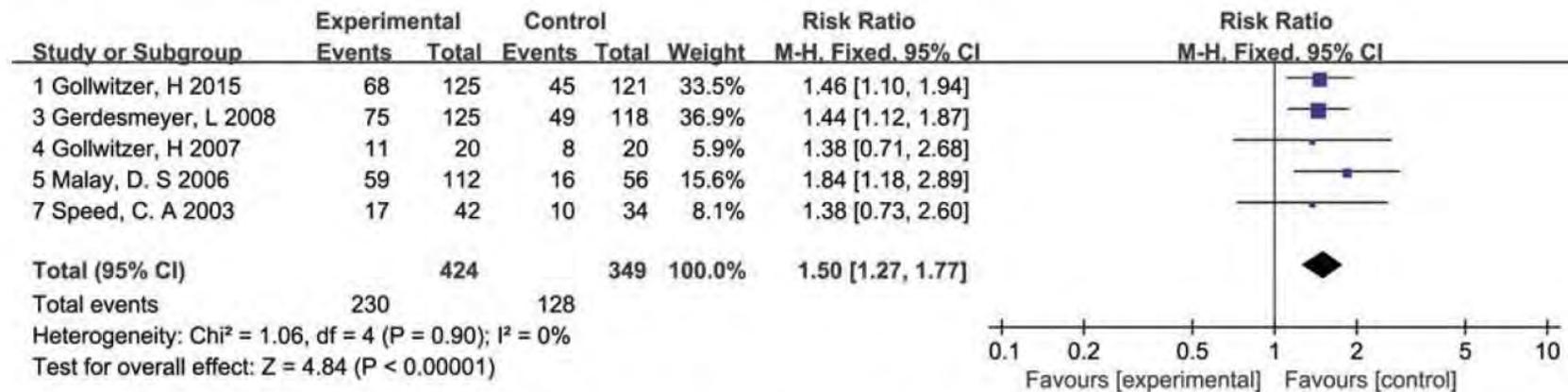


FIGURE 1. Forest plot for the success rate of reducing overall heel pain at 12 weeks between ESWT and placebo without local anesthesia.

ESWT: Sun et al., 2017

Sun et al. Medicine (2017) 96:15

www.md-journal.com

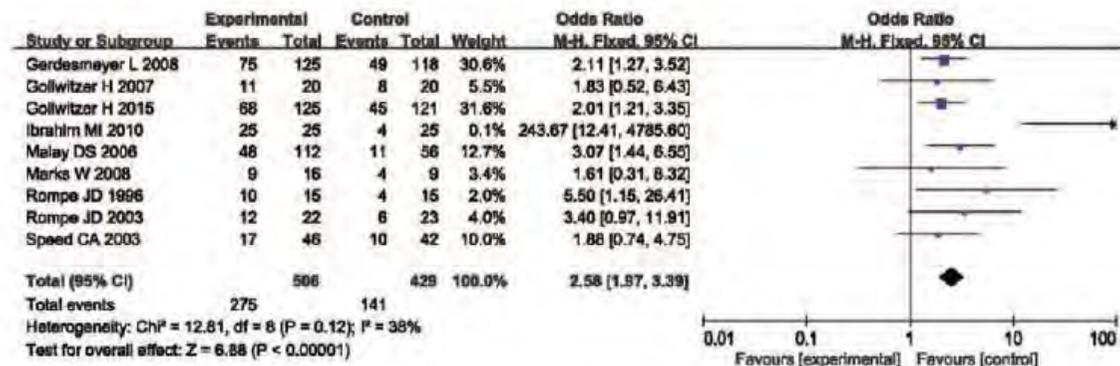


Figure 4. Forest plot of success rate of general ESWT in chronic plantar fasciitis. 95% CI=95% confidence interval, ESWT = extracorporeal shock wave therapy, fixed= fixed-effects model.

Alternativmethoden

- **22 Metaanalysen (!):**
- Orthesen, Einlagen u.a.
- ESWT (Stoßwellen)
- **Injektionstechniken**

Yang et al., 2017: plättchenreiches Plasma vs. Steroide (inj.)

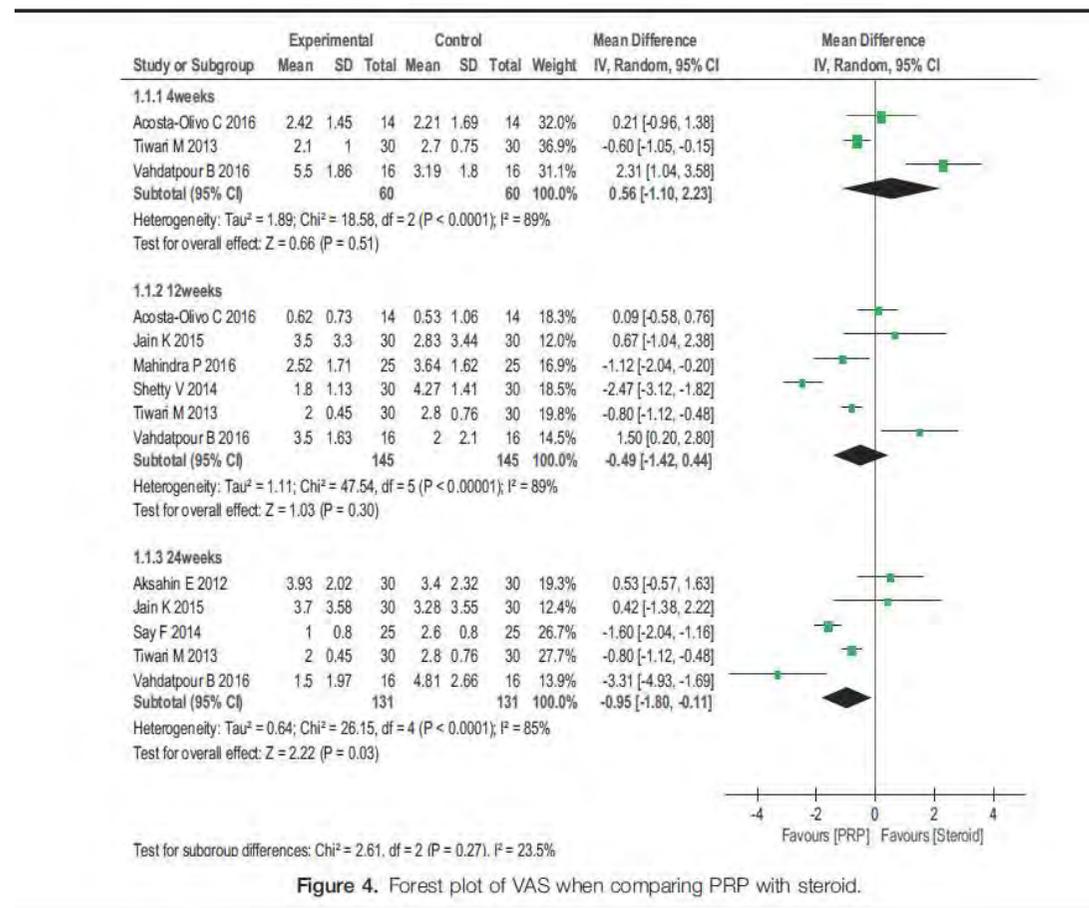


Figure 4. Forest plot of VAS when comparing PRP with steroid.

Tsikopoulos et al., 2015: Eigenblut vs. Steroide

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K. Tsikopoulos et al. / Physical Therapy in Sport 22 (2016) 114–122

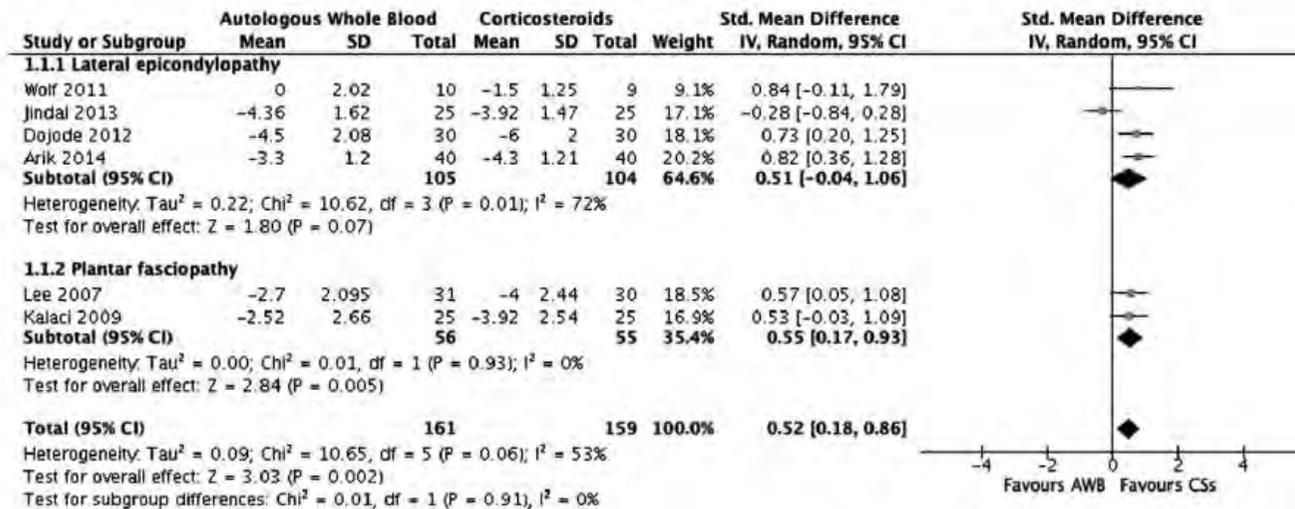


Fig. 3. Forest plot of standardized mean differences for the assessment of pain relief in the short term (i.e., 2–6 weeks after treatment). Vertical line shows no difference between the two comparison groups. A statistically significant difference in favour of the corticosteroid group is demonstrated in the plantar fasciopathy subgroup. AWB = Autologous Whole Blood; CSs = Corticosteroids; SMD = Standardized Mean Difference; IV = Inverse Variance; SD = Standard Deviation; CI = Confidence Interval.

Tsikopoulos, 2016: Injektionsbehandlungen

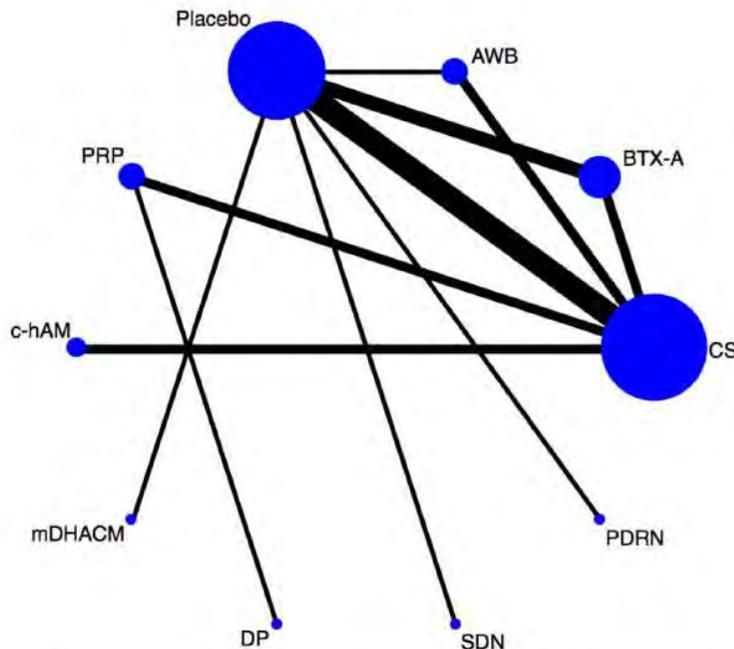
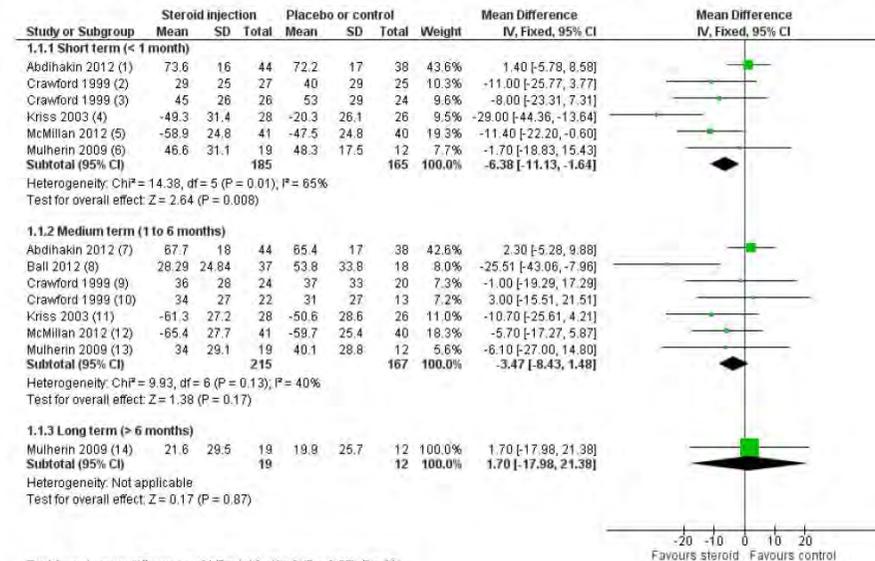


Figure 3 Network meta-analysis plot for the assessment of pain relief in the short term (0–2 months). CS, corticosteroid; PRP, platelet-rich plasma; mDHACM, micronised dehydrated human amniotic/chorionic membrane; DP, dextrose prolotherapy; BTX-A, botulinum toxin-A; PDRN, polydeoxyribonucleotide; c-hAM, cryopreserved human amniotic membrane; AWB, autologous whole blood; SDN, sham dry needling.

- Chorion/Amnion-Membran: in den ersten 2 Monaten gutes Ergebnis, keine Information über längeres Follow-up
- Botulinum-Toxin A: signifikante Schmerzbesserung bis 6 Monate
- Plättchenreiches Plasma: effektiv 0 – 6 Monate.

David et al., 2017, Steroide vs. Placebo (Cochrane)

Figure 4. Forest plot of comparison: I Local steroid injection versus placebo, outcome: I.1 Heel pain



Test for subgroup differences: Chi² = 1.12, df = 2 (P = 0.57), I² = 0%

Footnotes

- (1) 1 month (VAS), placebo control; LA in both groups
- (2) 1 month (VAS), placebo control; LA in both groups
- (3) 1 month (VAS), Placebo control; LA in both groups + tibial nerve block
- (4) 1 month (VAS - change score). Both groups had a soft anti-pronatory pad
- (5) 4 weeks (Foot pain of FHSQ; result x -1 as 0 = worst pain). Placebo, both groups had a tibial nerve block
- (6) 1 week (VAS). Tibial nerve block in both groups
- (7) 2 months (VAS), placebo control; LA in both groups
- (9) 12 weeks (VAS). Part placebo control; results from the 2 steroid groups combined
- (9) 3 months (VAS). Placebo control; LA in both groups
- (10) 3 months (VAS). Placebo control; LA in both groups + tibial nerve block
- (11) 24 weeks (VAS - change score). Both groups had a soft anti-pronatory pad
- (12) 12 weeks (Foot pain of FHSQ; result x -1 as 0 = worst pain). Placebo, both groups had a tibial nerve block
- (13) 6 weeks (VAS). Tibial nerve block in both groups
- (14) 26 weeks (VAS). Tibial nerve block in both groups

Zhang et al., 2011: Botulinum-Toxin A

1.3.6 Plantar Fasciitis

Babcock2005	-3.5	2.76	22	-0.5	2.92	21	6.0%	-1.04 [-1.68, -0.40]
Subtotal (95% CI)			22			21	6.0%	-1.04 [-1.68, -0.40]

Heterogeneity: Not applicable

Test for overall effect: $Z = 3.17$ ($P = 0.002$)

Total (95% CI)			390			316	100.0%	-0.27 [-0.44, -0.11]
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Heterogeneity: $\tau^2 = 0.01$; $\chi^2 = 15.55$, $df = 14$ ($P = 0.34$); $I^2 = 10\%$

Test for overall effect: $Z = 3.25$ ($P = 0.001$)

Test for subgroup differences: $\chi^2 = 9.13$, $df = 4$ ($P = 0.06$), $I^2 = 56.2\%$

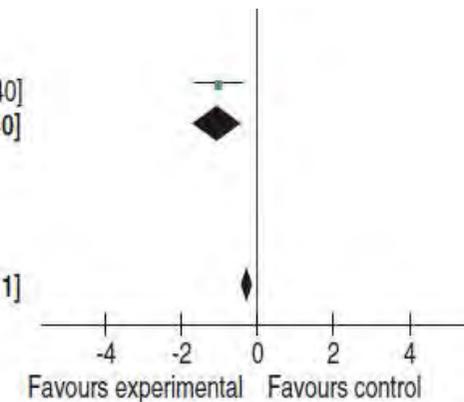


Fig. 3 Subgroup analysis of RCTs based on clinical conditions



Salvioli et al, 2017

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 **The Foot** 

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The effectiveness of conservative, non-pharmacological treatment, of plantar heel pain: A systematic review with meta-analysis 

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ABSTRACT

Plantar heel pain is one of the most common causes of pain and musculoskeletal pathologies of the foot. The aim of this systematic review was to identify the most effective, conservative and non-pharmacological treatments regarding pain in patients with plantar heel pain.

The authors searched 5 databases and included only randomized control trials which investigated the efficacy of a conservative non-pharmacological treatment compared to the placebo, for the outcome of pain.

Study selection, data collection and risk of bias assessment were conducted independently by two authors, and consensus was reached with a third author. Results were quantitatively summarized in meta-analyses, by separating homogeneous subgroups of trials by type of intervention.

A total of 20 studies that investigated the efficacy of 9 different types of interventions were included, with a total of 4 meta-analyses carried out. The interventions: shock waves, laser therapy, orthoses, pulsed radio-frequency, dry-needling, and calcaneal taping resulted in being effective treatments for the outcome pain in patients with plantar heel pain when compared to the placebo. However, considering that the improvements were very small, and the quality of evidence was mostly low or moderate for many of the interventions, it was not possible to give definitive conclusions for clinical practice.

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Canyilmaz et al, 2014: Strahlentherapie vs. Steroide (n=128)

Table 2 Comparison of pain data after 3 months and 6 months

Measurement	Value	RT group for 3 month	PG steroid group for 3 month	<i>P</i>	RT group for 6 month	PG steroid group for 6 month	<i>P</i>
VAS	Mean	2.8	4.6	<.001	2.7	4.6	<.001
	Minimum	0	0		0	0	
	Maximum	9	10		10	10	
	Median	2	5		2	5	
Five-level function score	Mean	78.3	60	<.001	78.7	59	<.001
	Minimum	30	6		35	0	
	Maximum	100	100		100	100	
	Median	85	57.5		80	60	
	Excellent	24 (40%)	10 (15.6%)		23 (38.3%)	10 (15.6%)	
	Good	24 (40%)	12 (18.8%)		23 (38.3%)	14 (21.9%)	
	Moderate	12 (20%)	32 (50%)		13 (21.7%)	29 (45.3%)	
	Poor	-	10 (15.6%)		1 (1.7)	11 (17.2%)	
Modified von Pannewitz pain score	Complete response	23 (38.3%)	10 (15.6%)	<.001	21 (35%)	10 (15.6%)	<.001
	Partial response	17 (28.3%)	6 (9.4%)		20 (33.3%)	8 (12.5%)	
	Minor response	11 (18.3%)	22 (34.4%)		12 (20%)	20 (31.3%)	
	No change	8 (13.3%)	20 (31.3%)		6 (10%)	20 (31.3%)	
	Increased pain	1 (1.7)	6 (9.4%)		1 (1.7%)	6 (9.4%)	

Abbreviations: PG = palpation guide; RT = radiation therapy; VAS = visual analog scale.

Gogna et al., 2016: Strahlentherapie vs. Plättchenreiches Plasma bei Sportlern

- 40 Patienten
- 6 Monate lang konservativ vorbehandelt – vergeblich
- Plättchenreiches Plasma vs. 3Gy/0.5Gy
- Kriterien: VAS, America Foot and Ankle Score, Dicke der Plantaraponeurose

- In beiden Gruppen: deutliche Schmerzlinderung, funktionelle Verbesserung, Abnahme der Dicke der Aponeurose
- Gleiche Ergebnisse nach 3 und 6 Monaten



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Die richtige Methode? Evidenz:

Methoden	Evidenzlevel	Bemerkungen
Einlagen/Orthesen	IA	Metaanalysen tw. widersprüchlich
ESWT	IA	Metaanalysen weitgehend einheitlich
Plättchenreiches Plasma	IA	
Eigenblut	IA	Wenig Studien
Steroide	IA	kurzzeitig
Botulinum	IA	Bis 6 Monate
Strahlentherapie	IB	Mehrere randomisierte Studien

Wie geht es weiter?

- Planung einer randomisierten Studie
- ESWT (3 Sitzungen) vs. Strahlentherapie (6x 0.5Gy)
- Interessierte Kolleginnen/Kollegen mögen mich kontaktieren:



