

# Effect of Ergon IASTM technique on pain, strength and range of motion in plantar fasciitis patients. RCT

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## Abstract

**Introduction.** Plantar fasciitis (PF) is a common foot problem caused by repetitive microtrauma or excessive overload of fascia. Instrument-assisted soft tissue mobilisation (IASTM), stretching, and strengthening exercises are more helpful in reducing the pressure of fascia and improving functional activities of the patients. The objective of the study was to compare the efficacy of instrument-assisted soft tissue mobilisation using the Ergon technique with conservative treatment in plantar fasciitis.

**Methods.** This randomised control trial was conducted at the Department of Physiotherapy of the University of Lahore Teaching Hospital and Citi Hospital Lahore. After registration, the patients were randomly allocated into treatment and conventional groups. Both groups received therapeutic ultrasound therapy, stretching strengthening exercises and cryotherapy, and the experimental group received additional instrument-assisted soft tissue mobilisation. Pain, strength, and range of motion were assessed at baseline, 1st, 3rd, and 5th week after treatment.

**Results.** 64 participants were randomly allocated into two groups; the Ergon group (ET = 32) and the conventional group (CT = 32). The mean age in the ET group was  $29.1 \pm 6.0$  and in the CT group was  $29.5 \pm 6.0$  and the sex distribution of the study population was 28.1% male and 71.9% female. There was a significant improvement ( $p < 0.05$ ) in pain, strength, and plantar flexion range of motion among all participants in the treatment group. However, no significant improvement was noticed in the dorsiflexion range ( $p > 0.05$ ). A within-group analysis showed improvement in the dorsiflexion range of both groups ( $p < 0.05$ ).

**Conclusions.** This randomised controlled trial demonstrates that the inclusion of instrument-assisted soft tissue mobilisation using the Ergon Technique for plantar fasciitis lasting 5 weeks is an effective treatment intervention in reducing pain and improving strength and ankle range of motion.

**Key words:** body mass index, exercise, fascia, pain, range of motion

## Introduction

Plantar fasciitis (PF) is a common cause of foot pain, accounting for approximately 11–15% of all foot disorders. PF typically results from repetitive microtrauma or excessive overload to the fascia [1]. PF has been shown to have a harmful effect on foot health and the overall functional life of patients, resulting in functional disabilities [2]. Females and those with a high body mass index are most prone to this condition [3].

Plantar fasciitis is characterised by a sharp, stabbing, and burning sensation in the posteromedial area of the heel. PF is thought to be the result of fascial irritation at its origin [4]. Supporting the longitudinal arch of the foot and providing shock absorption during dynamic activities are the main roles of the plantar fascia [5]. The main causes of plantar fasciitis involve swelling, injury causing damage, tenderness at the fascial origin, wearing hard footwear, prolonged working on flat surfaces, and continuous stress on the plantar fascia [6].

Individuals who have restricted ankle dorsiflexion, greater body mass index ( $BMI > 27 \text{ kg/m}^2$ ), or prolonged standing on one foot are more prone to developing fascial inflammation. A study concluded that restricted ankle range of motion is the highest risk factor in normal persons [7, 8]. Restricted ankle joint ranges cause hyperpronation of the foot, resulting in more pressure being placed on the plantar fascia. This problem is also very common in active individuals such as athletes and army persons who have greater stress on their feet during activities and sports, but there is a very weak as-

sociation between higher body mass index with plantar fasciitis in these populations [5]. Athletes who participate more in sports and put more stress on the fascia through prolonged activities are more prone to inflamed fascia because the plantar fascia stretches and contracts during the repetitive strain, which can cause an overuse injury [8].

After conservative management, many patients experienced reduced symptoms within 12–18 months [9]. When conservative treatment is unsuccessful, surgery is generally encouraged after at least 12 months from the onset of symptoms. In recent years, such plantar heel pain has been determined to actually be a non-inflammatory degenerative fasciosis [10]. One researcher performed histological examinations of surgical biopsy specimens and observed degenerative tissue markers such as collagen necrosis, angiofibroblastic hyperplasia, chondroid metaplasia, and matrix calcification [2].

Several techniques have been used for the treatment of plantar fasciitis. Along with conventional therapies, including cryotherapy, heat therapy and ultrasound therapy have been shown to produce an effective and lifelong clinical improvement in patients with chronic plantar fasciitis. There are significant effects of therapeutic modalities, such as ultrasound. Its efficiency and deep penetration can relax the fascia, improve patients' satisfaction towards the modalities and provide a repeatable protocol of use. Intense therapeutic ultrasound can safely and effectively reduce pain for patients with plantar fasciitis [11].

In IASTM, metal instruments are used to treat musculoskeletal-related injuries, adhesions and restrictions, and to

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provide aid to heal soft tissue. In recent years, IASTM has grown in popularity and utilisation amongst clinicians working with energetic populations [11]. When strokes are applied to the impaired or affected tissue using the Ergon Technique, the fibroblastic activity and their number increase, and the activity of fibronectin is also enhanced through localised inflammation. After the activation of fibroblast and fibronectin, they facilitate the synthesis and realignment of collagen, which is one of the proteins that makes up the extracellular matrix [12]. Previous studies have stated that IASTM can decrease pain and enhance soft tissue function and joint range of motion [11]. It has been hypothesised that for degenerative tissue conditions such as tendinosis and fasciosis, IASTM reinitiates the inflammatory response by developing managed micro-trauma in the affected tissues. It has been further hypothesised that this controlled microtrauma to degenerated tissue subsequently affects tissue maturation and remodelling.

Recent studies report that IASTM can decrease pain and improve soft tissue function and ankle joint range of motion. Therefore, the goal of this research was to determine the effectiveness of the instrument-assisted soft tissue mobilisation Ergon technique on sufferers struggling with plantar fasciitis.

## Subjects and methods

This randomised controlled trial was conducted in the department of physiotherapy, University of Lahore Teaching Hospital and Citi Hospital, Lahore from 5 Jan. 2021 to 22 Sep. 2021. 64 patients having plantar fasciitis were recruited into this study. Both male and female patients with plantar fasciitis, aged 18 to 40 years, were included in the study. Those having any surgical history, foot or ankle fracture, burns at the foot or any neoplastic growth at the foot were excluded from the study. After registration, the patients were randomly divided into two groups: 32 in the treatment group and 32 in the conventional group. Outcome measures or tool were the visual analogue scale (VAS) for pain, manual muscle test (MMT) for strength and range of motion (ROM) by goniometer. Both groups received therapeutic ultrasound therapy, stretching strengthening exercises and cryotherapy, while the experimental group also received instrument-assisted soft tissue mobilisation. Pain, strength, and range of motion were assessed at baseline, 1<sup>st</sup>, 3<sup>rd</sup>, and 5<sup>th</sup> week after treatment.

### Sample size calculation

Sample size was 64 and calculated through a calculator on the open Epitools website by using pain as the outcome measure.

### Procedure

All patients signed a written informed consent and screening was done after meeting the inclusion criteria.

Group A (experimental): 32 participants received the instrument-assisted soft tissue mobilisation technique using Ergon tools, such as the Fascializer and Rhino tools for soft tissue treatment and fascia therapy. Ergon tools were used to mobilise the tissues. The position of the patient was in prone. With the help of the Ergon tools, we performed strokes (sweeping motion) proximally to distally and distally to proximally in both directions over the myofascial restrictions and plantar fascia for 10 minutes. Along with the Ergon technique, conventional treatment, including foot cryotherapy, was performed for 20 minutes in the morning during the treatment sessions, and 20 minutes at night was advised before bed

in the home plan to treat the pain from chronic plantar fasciitis. Ultrasound therapy (continuous ultrasound therapy 1.8 w/cm<sup>2</sup> 1 MHz) for 8 minutes and plantar fascia stretching were performed in a seated position for three repetitions held for 30 seconds each. The Intrinsic Towel Strengthening exercise and Intrinsic TheraBand Strengthening exercise were performed by the patients 2 to 3 times. Every patient underwent three 40–45-minute treatment sessions per week for five weeks.

Group B (control): 32 participants received only conventional physical therapy (cryotherapy, ultrasound therapy, and planter fascia stretching exercises) for 30 minutes/session, 3 sessions/week for 5 weeks. Conventional treatment, including foot cryotherapy, was performed for 20 minutes in the morning during the treatment sessions, and 20 minutes at night was advised before bed in the home plan to treat the pain from chronic plantar fasciitis. Ultrasound therapy (continuous ultrasound therapy 1.8 w/cm<sup>2</sup> 1 MHz) for 8 minutes and plantar fascia stretching were performed in a seated position for three repetitions held for 30 seconds. The Intrinsic Towel Strengthening exercise and Intrinsic TheraBand Strengthening exercise were performed by the patients 2 to 3 times.

### Statistical analysis

All statistical analyses were done in SPSS version 21. Normality distribution was assessed using the Shapiro–Wilk test at a 95% confidence interval with an  $\alpha$  level of 0.05. Normality tests showed that all the readings of the participants included in the research were dissimilar at baseline, so non-parametric tests were applied over the variables of pain, strength, and range of motion. Descriptive statistics for the quantitative variables were reported using mean, median, standard deviation, and interquartile range, whereas for the categorical variable, percentage and frequency were reported. The Mann–Whitney test was used to observe the difference from baseline to the post-testing follow-up at 5 weeks, in pain, strength and ROM. After that, Post Hoc analysis was performed, which showed a pairwise comparison.

### Ethical approval

The research related to human use has complied with all the relevant national regulations and institutional policies, has followed the tenets of the Declaration of Helsinki, and has been approved by the ethics committee of University Institute of Physical Therapy of the University of Lahore (approval No.: IRB-UOL-FAHS/822/2021). The study was registered at www.irct.ir and the trial id is 58728.

### Informed consent

Informed consent has been obtained from all individuals included in this study.

## Results

### Descriptive analysis

A total of 64 participants were included in this study, with 32 participants assigned to group A and 32 participants to group B. Among the total participants of the study, 18 were males (28.1%) and 46 were females (71.9%). In group A, the total number of male and female participants was 8 and 24, respectively, while in group B, the total number of male and female participants was 10 and 22, respectively. The mean age of the participants in group A was 29.1 ± 6.0 years and in group B was 29.5 ± 6.0.

Table 1. Intergroup analysis (Mann–Whitney test)

Variable	Assessment	Group A (mean rank)	Group B (mean rank)	Median (IQR)	p-value
VAS	at baseline	35.67	29.33	6.0 (1)	0.13
	at 1 <sup>st</sup> week	39.91	25.09	4.0 (1)	0.001*
	at 3 <sup>rd</sup> week	28.19	36.81	3.0 (1)	0.05*
	at 5 <sup>th</sup> week	23.73	41.27	1.0 (2)	0.000*
Strength	at baseline	29.92	35.08	3.0 (1.75)	0.15
	at 1 <sup>st</sup> week	32.94	32.06	3.0 (1)	0.83
	at 3 <sup>rd</sup> week	36.94	28.06	4.0 (0)	0.03*
	at 5 <sup>th</sup> week	36.22	28.78	4.0 (1)	0.07
ROM PF	at baseline	22.03	42.70	44.0 (7.25)	0.000*
	at 1 <sup>st</sup> week	23.50	41.50	46.0 (4.75)	0.000*
	at 3 <sup>rd</sup> week	25.11	39.89	47.50 (2)	0.001*
	at 5 <sup>th</sup> week	33.02	31.98	49.0 (1.25)	0.82
ROM DF	at baseline	28.34	36.66	17.0 (2)	0.07
	at 1 <sup>st</sup> week	29.89	35.11	18.0 (2)	0.24
	at 3 <sup>rd</sup> week	33.25	31.75	19.0 (2)	0.74
	at 5 <sup>th</sup> week	34.05	30.95	20.0 (0.75)	0.38

VAS – visual analogue scale, PF – plantar flexion, DF – dorsiflexion, IQR – interquartile, ROM – range of motion  
 Inter group analysis of pain, strength and range of motion  
 \*  $p > 0.05$

### Between-group results

All groups were compared to observe differences from baseline to post-testing follow-up at 5 weeks, in pain, strength, and ROM of plantar/dorsiflexion. The between-group analysis using the Mann–Whitney test showed that in group A, there was a statistically significant difference in VAS, strength, and ROM of the plantar flexor at the 3<sup>rd</sup> week ( $p < 0.05$ ) but no significant result at the 5<sup>th</sup> week ( $p > 0.05$ ), with the mean rank of the VAS scores was at baseline: 35.67, at the 1<sup>st</sup> week: 39.91, 3<sup>rd</sup> week: 28.19, and 5<sup>th</sup> week: 23.73, while the mean rank of strength was at baseline: 29.30, at the 1<sup>st</sup> week: 32.94, 3<sup>rd</sup> week: 36.94, and 5<sup>th</sup> week: 36.22. The mean rank of the ROM of the plantar flexors was at baseline: 22.03, at the 1<sup>st</sup> week: 23.50, 3<sup>rd</sup> week: 25.11, and 5<sup>th</sup> week: 33.02, while the mean rank of ROM of the dorsi flexors was at baseline: 28.34, at the 1<sup>st</sup> week: 29.89, 3<sup>rd</sup> week: 33.25, and 5<sup>th</sup> week: 34.05. In group B, the mean rank of the VAS score was at baseline: 29.33, at the 1<sup>st</sup> week: 25.09, 3<sup>rd</sup> week: 36.81, and 5<sup>th</sup> week: 41.27, while the mean rank of strength was at baseline: 35.08, at the 1<sup>st</sup> week: 32.06, 3<sup>rd</sup> week: 28.06, and 5<sup>th</sup> week: 28.78. The mean rank of the ROM of the plantar flexors was at baseline: 42.70, at the 1<sup>st</sup> week: 41.50, 3<sup>rd</sup> week: 39.89, and 5<sup>th</sup> week: 31.98, while the mean rank of the ROM of the dorsi flexors was at baseline: 36.66, at the 1<sup>st</sup> week: 35.11, 3<sup>rd</sup> week: 31.75, and 5<sup>th</sup> week: 30.95. The results showed that the pain decreased and the strength improved in the experimental group. No statistically significant difference was observed in strength and ROM of the plantar flexors at the 5<sup>th</sup> week and no statistically significant results in the ROM of the dorsi flexors were noted ( $p > 0.05$ ) (Table 1).

Post hoc analysis showed a pairwise analysis, which showed significant differences between pain at baseline with the 1<sup>st</sup> week, 3<sup>rd</sup> week and 5<sup>th</sup> week, while pain at the 1<sup>st</sup> week with 3<sup>rd</sup> week and 5<sup>th</sup> week were also improved and the pain at the 3<sup>rd</sup> week showed significant improvement at the 5<sup>th</sup> week. On the other hand, there were no significant differences of strength at baseline compared to the 1<sup>st</sup> week but it showed

Table 2. Post hoc analysis

Variables	p-value
Pain at baseline – pain at 1 <sup>st</sup> week	0.000*
Pain at baseline – pain at 3 <sup>rd</sup> week	0.000*
Pain at baseline – pain at 5 <sup>th</sup> week	0.000*
Pain at 1 <sup>st</sup> week – pain at 3 <sup>rd</sup> week	0.010*
Pain at 1 <sup>st</sup> week – pain at 5 <sup>th</sup> week	0.000*
Pain at 3 <sup>rd</sup> week – pain at 5 <sup>th</sup> week	0.000*
Strength at baseline – strength at 1 <sup>st</sup> week	0.903
Strength at baseline – strength at 3 <sup>rd</sup> week	0.000*
Strength at baseline – strength at 5 <sup>th</sup> week	0.000*
Strength at 1 <sup>st</sup> week – strength at 3 <sup>rd</sup> week	0.000*
Strength at 1 <sup>st</sup> week – strength at 5 <sup>th</sup> week	0.000*
Strength at 3 <sup>rd</sup> week – strength at 5 <sup>th</sup> week	0.082
ROM PF baseline – ROM PF 1 <sup>st</sup> week	0.000*
ROM PF baseline – ROM PF 3 <sup>rd</sup> week	0.000*
ROM PF baseline – ROM PF 5 <sup>th</sup> week	0.000*
ROM PF 1 <sup>st</sup> week – ROM PF 3 <sup>rd</sup> week	0.001*
ROM PF 1 <sup>st</sup> week – ROM PF 5 <sup>th</sup> week	0.000*
ROM PF 3 <sup>rd</sup> week – ROM PF 5 <sup>th</sup> week	0.002*
ROM DF baseline – ROM DF 1 <sup>st</sup> week	0.001*
ROM DF baseline – ROM DF 3 <sup>rd</sup> week	0.000*
ROM DF baseline – ROM DF 5 <sup>th</sup> week	0.000*
ROM DF 1 <sup>st</sup> week – ROM DF 3 <sup>rd</sup> week	0.000*
ROM DF 1 <sup>st</sup> week – ROM DF 5 <sup>th</sup> week	0.000*
ROM DF 3 <sup>rd</sup> week – ROM DF 5 <sup>th</sup> week	0.006*

PF – plantar flexion, DF – dorsiflexion, IQR – interquartile, ROM – range of motion  
 Post hoc analysis of pain, strength and range of motion  
 \*  $p > 0.05$

significant improvement at baseline compared to the 3<sup>rd</sup> week and 5<sup>th</sup> week, while strength at the 1<sup>st</sup> week compared to the 3<sup>rd</sup> week and 5<sup>th</sup> week were also improved and strength at the 3<sup>rd</sup> week showed no significant improvement compared to the 5<sup>th</sup> week. The ROM of the plantar flexor showed significant improvement at baseline compared to the 1<sup>st</sup> week, 3<sup>rd</sup> week and 5<sup>th</sup> week, while the ROM of the plantar flexor at the 1<sup>st</sup> week also improved compared to the 3<sup>rd</sup> week and 5<sup>th</sup> week and the ROM of the plantar flexor at the 3<sup>rd</sup> week also showed significant improvement compared to the 5<sup>th</sup> week. Meanwhile, the ROM of the dorsi flexor showed significant improvement at baseline compared to the 1<sup>st</sup> week, 3<sup>rd</sup> week and 5<sup>th</sup> week, while the ROM of the dorsi flexor at the 1<sup>st</sup> week were also improved compared to the 3<sup>rd</sup> week and 5<sup>th</sup> week and the ROM of the dorsi flexor at 3<sup>rd</sup> week also showed significant improvement compared to the 5<sup>th</sup> week (Table 2).

## Discussion

Plantar fasciitis is a common condition of the foot and is caused by excessive stress and overload to the fascia. The aim of the study was to compare the efficacy of the Ergon technique with conventional physical therapy treatment (cryotherapy, ultrasound therapy, and stretching strengthening exercises) in treating plantar fasciitis. The current study has shown significant improvement in participants suffering from plantar fasciitis. The results have shown that the Ergon technique is more effective in reducing pain and improving muscle strength and ankle ranges in patients with plantar fasciitis.

In a study conducted by Jones et al. [13] in 2019, it was reported that instrument-assisted soft tissue techniques (IASTM) are more effective than conventional physical therapy. This pilot study showed that the IASTM technique is more effective in reducing pain and improving patients' daily functional activities. Similarly, this pilot study also suggests that exercises play a vital role in the reduction of heel pain in plantar fasciitis as well [13]. In the current study, 5 weeks of the Ergon technique protocol was given to the patients along with stretching and strengthening exercises and this technique showed significant improvement in strength, range of motion, and reduction in pain.

Harrison et al. [14] in 2020 conducted a study on the use of IASTM versus massage and proprioceptive neuromuscular facilitation (PNF) stretching techniques at improving hamstring flexibility. 20 participants were recruited for their study; 12 in the IASTM group and 8 in the massage/PNF group. The assessment was performed using the visual analogue scale (VAS), Disablement in Physically Active Scale (DPAS), and Global Rate of Change (GRC). The results showed that both treatments were effective in improving hamstring flexibility immediately after treatment. They also stated in their study that there were no significant differences in DPAS and GRC [14]. Another study conducted by Fousekis et al. [15] in 2016 recruited 70 amateur soccer players and the outcomes were the pain pressure threshold (PPT) and the visual analogue scale (VAS). The results showed all treatment techniques were effective in the management of myofascial release, but the techniques are not comparable. The Ergon technique produced significantly better results in reducing myofascial tenderness [15]. In the current study, instrument-assisted soft tissue mobilisation (IASTM) was more effective than conservative treatment ( $p < 0.05$ ). 64 patients with plantar fasciitis were recruited in this study, 32 in the Ergon group and 32 in the conservative group. All outcomes (pain, strength, and ROM) were improved in the experimental group, i.e. the Ergon group.

Another pilot study, conducted by Maniatakis et al. [16] in 2020, showed that IASTM and foam rolling can lead to greater progress in the passive range of motion than Kinesio Taping. The Ergon IASTM technique can also improve the shoulder's throwing ability [16]. The results of the current study also showed significant improvement in pain, strength, and range of motion in the treatment group. The targeted muscles are the tibialis anterior in the foot and the calf muscle. When the Ergon technique is applied to the foot, it releases the plantar fascia and decreases the restriction around the joint. So, all these changes helped in improving the range of motion and decreasing the pain.

Garrett et al. [17] conducted a study in 2019 in which participants were divided into three groups: the Graston technique with stretching, effleurage with stretching, and only stretching group. A 6-week treatment protocol was performed and the outcome measures in this study were the foot health status questionnaire, McGill pain questionnaire, and visual analogue scale. The researchers concluded that the Graston technique is an effective technique to treat chronic heel pain. They also recommended the clinicians to use the Graston technique to treat patients with chronic heel pain along with specific stretching of the plantar fascia and other treatment protocols [17]. In the current study, participants were divided into two groups: the Ergon technique group and the control group. Five weeks of the treatment protocol was applied in the current study and the assessment was done through the visual analogue scale (VAS) and through manual muscle and range of motion (ROM) testing. The results showed that the Ergon group achieved more clinical improvement as compared to the control group ( $p < 0.05$ ). The between-group analysis showed improved plantar flexion in both groups, but there was no change in dorsiflexion. Similarly, the within-group analysis showed equal improvement in both groups.

Prakash et al. [18] in 2014 stated in their study that manual therapy is more effective as compared to conventional physical therapy in the treatment of plantar fasciitis. They selected 30 participants with plantar fasciitis and randomly divided them into a treatment group, which received manual therapy with stretching and strengthening exercises, and a conventional group, which received ultrasound therapy, ice pack with stretching and strengthening exercises for 3 weeks. Patients were evaluated through a pain rating scale (VAS) and foot function index (FFI). The result of this study showed that the experimental group differed significantly in their improved pain and disability in patients with plantar fasciitis [18]. In the current study, 64 patients with plantar fasciitis were randomly divided into the Ergon group and the control group. Stretching and strengthening exercises were given in both groups for 5 weeks, resulting in improvements in pain, strength, and range of motion in patients with plantar fasciitis.

Stanek et al. [19] conducted a study in 2018 in which 44 participants were randomly divided into three groups: Graston, compressive myofascial release, and control group. The result of this study showed that a single treatment session of compressive myofascial release is more effective than a single treatment of the Graston technique for improving the ankle dorsiflexion range. However, the Graston technique recommends 4 to 12 treatment sessions before reevaluating the patients [19]. Present studies also support this study that after 5 weeks, the intervention of Ergon technique is more effective than conventional treatment in reducing plantar pain and improving muscle strength and ankle range of motion.

## Limitations

The trial experienced difficulty in accessing patients in the hospitals due to the COVID-19 pandemic and found most of the patients to be generally non-cooperative.

## Conclusions

This randomised control trial demonstrates that the inclusion of instrument-assisted soft tissue mobilisation using the Ergon technique for plantar fasciitis lasting 5 weeks is an effective treatment intervention to reduce pain and improve strength and ankle range of motion.

## Recommendation

It is recommended that clinicians should use the Ergon technique to treat patients with plantar fasciitis pain, along with specific stretching of the plantar fascia and other treatment protocols. The Ergon technique is more effective in reducing pain and improving muscle strength and ankle ranges in patients with plantar fasciitis.

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## Disclosure statement

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## Conflict of interest

The authors state no conflict of interest.

## References

1. Cutts S, Obi N, Pasapula C, Chan W. Plantar fasciitis. *Ann R Coll Surg Engl.* 2012;94(8):539–542; doi: 10.1308/003588412X1317122159245.
2. Irving DB, Cook JL, Young MA, Menz HB. Impact of chronic plantar heel pain on health-related quality of life. *J Am Podiatr Med Assoc.* 2008;98:283–289; doi: 10.7547/0980283.
3. Irving DB, Cook JL, Menz HB. Factors associated with chronic plantar heel pain: a systematic review. *J Sci Med Sport.* 2006;9(1–2):11–22; doi: 10.1016/j.jsams.2006.02.004.
4. Akhtar N, Rasheed P, Ahmad Z. Role of physical medicine and rehabilitation intervention for plantar fasciitis. *Pak Armed Forces Med J.* 2008;58(3):239–243.
5. Saini RA, Mishra RK. A comparative study of conventional versus interventional treatment in patients of plantar fasciitis. *Int J Orthop Sci.* 2017;3(4):765–8; doi: 10.22271/ortho.2017.v3.i4k.106.
6. Thomas JL, Christensen JC, Kravitz SR, Mendicino RW, Schuberth JM, Vanore JV, et al. The diagnosis and treatment of heel pain: a clinical practice guideline – revision 2010. *J Foot Ankle Surg.* 2010;49(3):1–19; doi: 10.1053/j.jfas.2010.01.001.
7. Riddle DL, Pulisic M, Pidcoe P, Johnson RE. Risk factors for plantar fasciitis: a matched case-control study [published correction appears in *J Bone Joint Surg Am.* 2003; 85A(7):1338]. *J Bone Joint Surg Am.* 2003;85A(5):872–877; doi: 10.2106/00004623-200305000-00015.
8. Van Leeuwen KD, Rogers J, Winzenberg T, van Middelkoop M. Higher body mass index is associated with plantar fasciopathy/'plantar fasciitis': systematic review and meta-analysis of various clinical and imaging risk factors. *Br J Sports Med.* 2016;50(16):972–981; doi: 10.1136/bjsports-2015-094695.
9. Lim AT, How CH, Tan B. Management of plantar fasciitis in the outpatient setting. *Singapore Med J.* 2016;57(4):168; doi: 10.11622/smedj.2016069.
10. Lemont H, Ammirati KM, Usen N. Plantar fasciitis: a degenerative process (fasciosis) without inflammation. *J Am Podiatr Med Assoc.* 2003;93(3):234–237; doi: 10.7547/87507315-93-3-234.
11. Miners AL, Bougie TL. Chronic Achilles tendinopathy: a case study of treatment incorporating active and passive tissue warm-up, Graston Technique®, ART®, eccentric exercise, and cryotherapy. *J Can Chiropr Assoc.* 2011;55(4):269–279.
12. Hammer WI. The effect of mechanical load on degenerated soft tissue. *J Bodyw Mov Ther.* 2008;12(3):246–256; doi: 10.1016/j.jbmt.2008.03.007.
13. Jones ER, Finley MA, Fruth SJ, McPoil TG. Instrument-assisted soft-tissue mobilization for the management of chronic plantar heel pain: a pilot study. *J Am Podiatr Med Assoc.* 2019;109(3):193–200; doi: 10.7547/16-105.
14. Harrison K, Carver M, Dietrich W, Mc Devitt J, Vanic K, Rozea G. The use of instrument assisted soft tissue mobilization vs massage and proprioceptive neuromuscular facilitation stretching techniques on improving hamstring flexibility. *Int J Orthop Res.* 2020;3(1):35–45.
15. Fousekis K, Kounavi E, Doriadis S, Mylonas K, Kallistratos E. The effectiveness of Instrument-assisted soft tissue mobilization technique (Ergon® Technique), cupping and ischaemic pressure techniques in the treatment of amateur athletes' myofascial trigger points. *J Nov Physiother.* 2016;S3:009; doi: 10.4172/2165-7025.S3-009.
16. Maniatakis A, Mavraganis N, Kallistratos E, Mandalidis D, Mylonas K, Angelopoulos P, et al. The effectiveness of Ergon Instrument-Assisted Soft Tissue Mobilization, foam rolling, and athletic elastic taping in improving volleyball players' shoulder range of motion and throwing performance: a pilot study on elite athletes. *J Phys Ther Sci.* 2020;32(10):611–614; doi: 10.1589/jpts.32.611
17. Garrett TR, Neibert PJ. Graston Technique® as a treatment for patients with chronic plantar heel pain. *Clin Pract Athl Train.* 2019;2(3):35–47; <https://doi.org/10.31622/2019/0003.4>.
18. Prakash S, Misra A. Effect of manual therapy versus conventional therapy in patients with plantar fasciitis – a comparative study. *Int J Physiother Res.* 2014;2(1):378–382.
19. Stanek J, Sullivan T, Davis S. Comparison of compressive myofascial release and the Graston Technique for improving ankle-dorsiflexion range of motion. *J Athl Train.* 2018;53(2):160–167; doi: 10.4085/1062-6050-386-16.