

Extracorporeal Pulse Activation Technology (EPAT®) in Acute and Chronic Musculoskeletal Pain of the Lower Extremity: A case series.

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Background

Extracorporeal Pulse Activation Treatment (EPAT®), is a non-invasive, non-surgical option for the treatment of acute & chronic musculoskeletal conditions, such as plantar fasciitis. Plantar fasciitis is the most common cause of heel pain and accounts for approximately 11% to 15% of all foot symptoms requiring professional care in the adult. (1, 2, 4, 5) The course of the disease is typically self-limiting, and about 90% of patients are successfully treated with nonsurgical measures. (1, 2, 3, 4) It was with this in mind that this study was undertaken to determine the possible effect Extracorporeal Pulse Activation Treatment (EPAT®) may have on various acute or chronic musculoskeletal conditions of the lower extremity in a general population. Extracorporeal Pulse Activation Treatment (EPAT®) releases high intensity acoustic pressure waves into the target tissue, converting a chronic inflammatory condition into an acute stage, allowing the body to respond by increasing circulation and cellular metabolism around the affected tissue. These waves consist of pneumatically generated pressure-pulses that spread through the tissue like three-dimensional acoustic waves. These unique pressure waves stimulate the early expression of angiogenesis related growth factors including eNOS (endothelial nitric oxide synthase), VEGF (vessel endothelial growth factor) and PCNA (proliferating cell nuclear antigen). (7) This promotes neovascularization, improves blood supply and increases cell proliferation and tissue regeneration to repair tendon and bone tissue. (7) There are many benefits to Extracorporeal Pulse Activation Treatment (EPAT®) such as full weight bearing post treatment, no incision necessary so there is no risk of infection at the treatment site, patients are able to return to normal activities immediately post treatment and strenuous activities in 4 weeks, and it does not require anesthesia. (6)

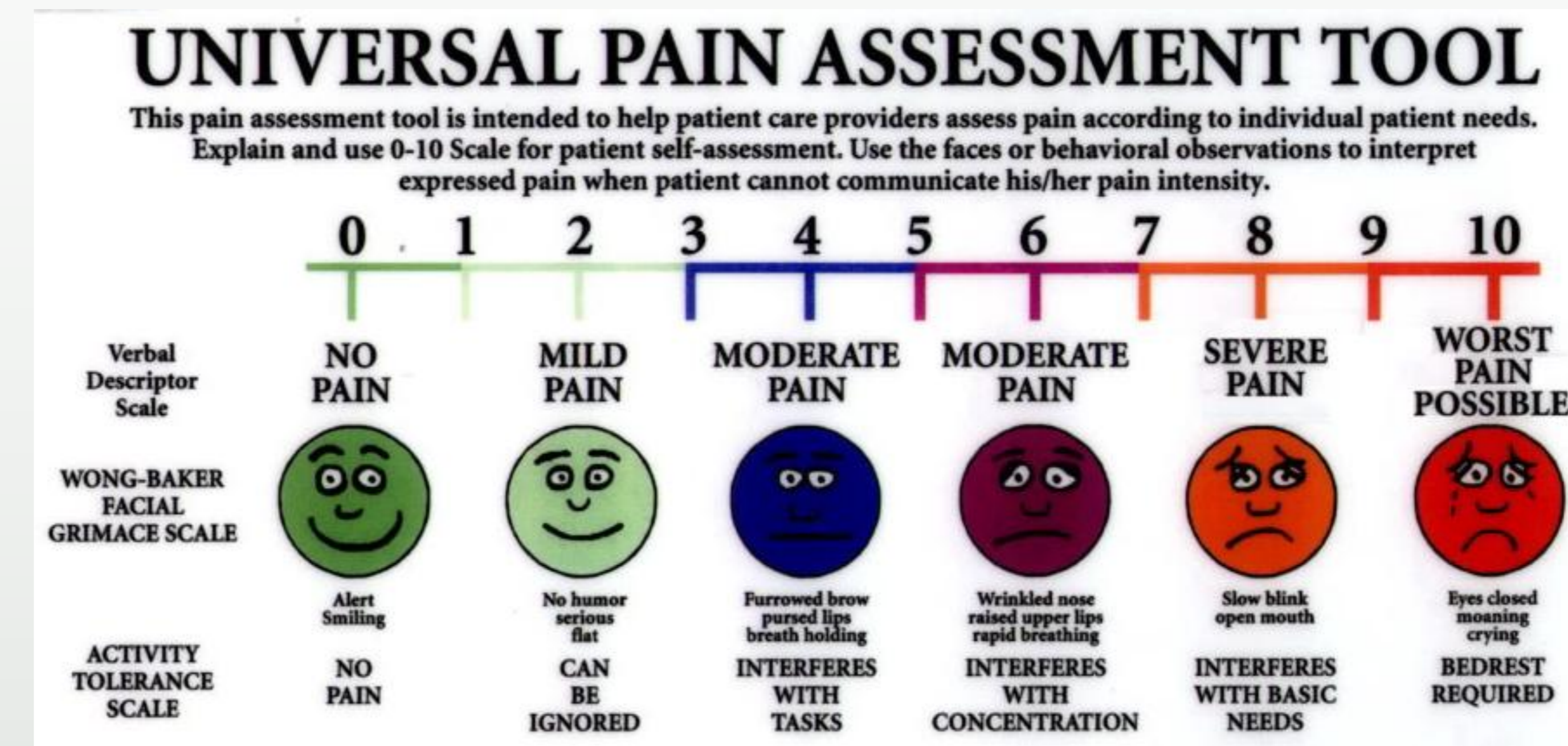
Purpose

The objective of this study was to assess the therapeutic value of Extracorporeal Pulse Activation Technology (EPAT®) in the conservative management of patients suffering from plantar fasciitis.

Methods and Discussions

25 subjects were followed for the purpose of this study. A STORZ Medical D-Actor® 200 was used to administer the Extracorporeal Pulse Activation Treatment (EPAT®) treatment. (Figure 2) The treatment regimen consisted of 2000 pulses, once a week for 3 weeks for each pathological foot, and then a 12 week follow up appointment. Initially, patients started each treatment indicating their pain level on the visual analog scale. (Figure 1) Sessions commenced at a frequency that was tolerable for them. This level was recorded. The energy was then gradually increased in increments of 0.6 to 1.4 bar above their starting energy level. This level was then recorded. An intensity level between 2.6- 3.6 bar, is said to be optimal, and all efforts were made to attain this. (This is what we found) Patients were asked to refrain from NSAID use, but allowed to take acetaminophen for pain relief as it was thought that NSAID's would decrease the inflammatory response needed for this treatment. Patients were encouraged to continue normal daily activities. Patients were followed up at two and six week intervals.

Figure 1



Results

Our clinical study showed an excellent outcome 3 weeks post treatment and at a 12 week follow up. Particularly, it was noticed that no recurrence of pain occurred or worsened during treatment or weeks after the initial treatment. All 25 patients were delivered Extracorporeal Pulse Activation Treatment (EPAT®). Each patient received 2,000 impulses at a energy setting of 3.6 bar and frequency of 11 hertz. The primary endpoints were the 1st week, 2nd week, 3rd week and finally the 12th week. Significant improvement of a reduction in pain occurred initially and with each subsequent treatment involving Extracorporeal Pulse Activation Treatment (EPAT®) with patients indicating that there was a 90% improvement.

Graph 1

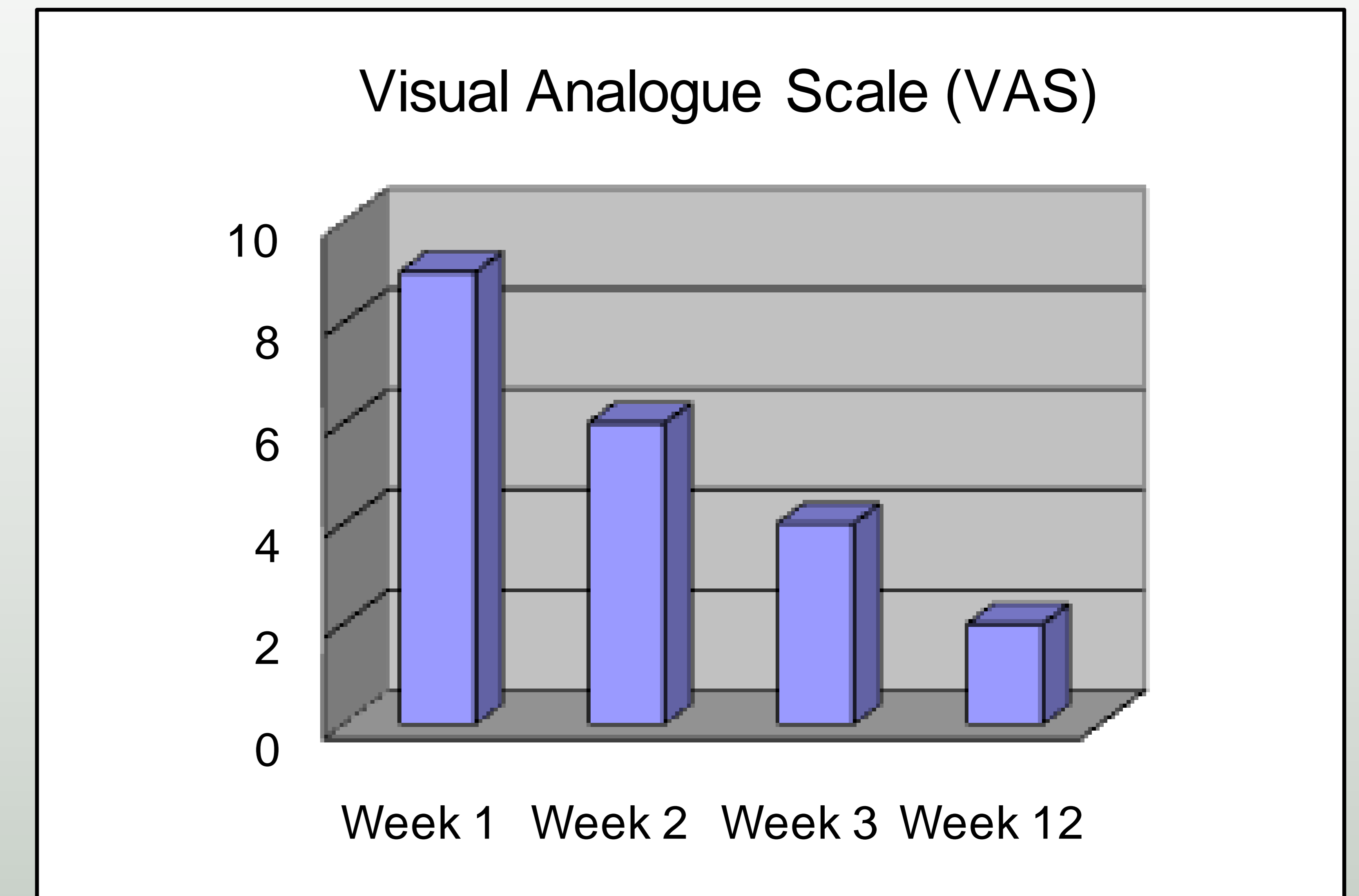


Figure 2



Limitations of the Study

- Small sample size
- Possible confounding variables, such as previous treatments with steroids
- Patient compliance with after care instructions
- Variability in Patient tolerance to D-Actor® settings

Acknowledgement

We would like to thank our patients for participating and supporting this study. Also, we would like to recognize and acknowledge the talent of our graphic designer, Mr. Aquilino, for putting it all together. Without them, this paper would not be possible.

Conclusion

In conclusion, Extracorporeal Pulse Activation Treatment (EPAT®) is suitable as an effective procedure in the treatment of chronic plantar fasciitis of the heel. Extracorporeal Pulse Activation Treatment (EPAT®) can also be beneficial as an effective treatment for chronic pain for most muscular, neurological and orthopedic pathologies of the foot.

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