

Glucosamine as a Pain Relieving Agent in Planter Fasciitis

Mukesh Tiwari¹, Neena Tiwari²

¹ Assoc. Prof., Department of Orthopedics, NIMS Medical College, Jaipur, India

² Asst. Prof., Department of Anesthesia, NIMS Medical College, Jaipur, India

ABSTRACT

Plantar fasciitis is the most common cause of the plantar heel pain. Its main features are pain, tenderness mostly on the medial aspect of the calcaneum near the sole of heel. There are many conservative methods for treatment of the plantar fasciitis which include rest, massage, night splints, orthoses, injections, cast NSAID, shock wave therapy. The glucosamine is one of the nutritional product which has a good anti- properties and is already in use for arthritis knee. Depending on anti-inflammatory analgesic property can also be used in planter fasciitis. In this study 17 patients were studied after giving fixed dose of 1200 mg of glucosamine. The evaluation was done on linkert pain score. The p-value in studied group was <0.00001 which shows a good effect of this compound on plantar fasciitis.

Keywords: Plater fasciitis, glucosamine, pain.

***Author for Correspondence** E-mail: wakeuptum@gmail.com

1. INTRODUCTION

The planter fascia acts as deep fascia of the foot. This comprise of thinner portion which attaches to medial calcanel tuberosity and thicker central portion which also has the medial and lateral part. The central portion sends five bands which is surrounded by digital tendons to toes [1, 2]. The planter faciitis is one of the common disorder and has approximately one million physician visit per year [3].

The planter fasciitis is an inflammation of the thick band of the tissues which connects the heel bone to the toes. This band of tissue is meant to support the bony arch of foot. planter fasciitis can be a degenerative chronic tendopathy. The microtears of the bone tendon union may be the root cause. Healing this union more efficiently may speed the recovery [1]. Persons with foot arch problems, obesity,

repetitive loading on feet, long distance runners [4–10] sudden weight gain, tight tendo achillis and persons wearing poor arch support are most liable to suffer from this. It is generally affects the middle age to older age groups.

Patients with planter fasciitis complains of the pain in heel specially at the first step in morning [9] and with walking. This pain aggravates with sudden weight gain. There may also be presence of stiffness in the feet. On clinical examination there is tenderness on the medial aspect of calcaneal tuberosity. There is specific test known as weight bearing Windlass test [7], where one may have pain on stretching of the toes due to stretching of the planter fascia during weight bearing.

There are various available treatments for the planter fasciitis which include pharmacological therapy by NSAID [11],

exercises [12], myofascial release [13], iontophoresis, local corticosteroid injections. Glucosamine is one of the nutritional compound which posses the anti-inflammatory properties which is already used in arthritis knee. It has various effects. Less no. of studies are carried out for its effectiveness in planter fasciitis. This study is carried out to know the pain relieving effect of glucosamine on planter fasciitis.

METHODS

This study was conducted at the orthopedic department of NIMS university and attached hospital. The patients were randomly selected from the outdoor of the department which are coming from nearby areas. Total of 17 patients were studied for the effect of glucosamine on the pain of planter fasciitis. The pain was evaluated before and after the study according to verbal pain scale [12]. The patients were given on verbal rating scale starting from no. 0 for no pain to no. 5 for overwhelming pain.

The inclusion criteria for study were:

- (i) Pain in heel area less than 2 months.
- (ii) Pain worse with first morning step.

The patients were excluded from this study depending upon following criteria:

- (i) Prior use of glucosamine for any purposes.
- (ii) Traumatic injury.
- (iii) Pregnancy or lactation.

All subjects received 1200 mg of glucosamine

per day for at least 6 weeks or longer till they become pain free.

RESULTS

Total 17 patients were studied. Out of these 17 patients 14 were male and 3 were female. These patients range from the age group 25 to 60 year. The median age group is 44.75 year. Out of these 17 patients ten male were have pain score before treatment (PSBT) of 4, while four patients had the score of 5. All the females have the PSBT of 4.

After the treatment with glucosamine the pain score after treatment (PSAT) was two in twelve male patients and one in two male patients. The PSAT was two in two female patients and one female patient did not have any relief (Table 1).

Study shows a good effect on relief in pain (94.11%) although the regression of noticeable amount of severity (PSAT of 1) was only seen in only about 11.7% of patients. The PSBT and PSAT was same in 5.88% of patients.

Depending on these results the mean PSBT 4.25 while the PSAT was 2. On this basis the *t*-score was 11.86. The analysis shows that *p*-value in this study in after treatment group comes to be <0.00001, This shows a significant change in pain status after treatment (Tables 2 and 3)

Table I Number and Division of Patients in Study

Total no. of patients (17)	
Male	Female
Fourteen (14)	Three (3)

Table II Pain Score before Treatment (PSBT).

	No. of patients	PSBT
Male	Ten (10)	Four (4)
	Four (4)	Five (5)
Female	Three (3)	Four (4)

Table III Pain Score after Treatment (PSAT).

	No. of patients	PSAT
Male	Two (2)	One (1)
	Twelve (12)	Two (2)
Female	Two (2)	Two (2)
	One (1)	Four (4)

DISCUSSION

In various countries the glucosamine is marketed as nutritional supplement. It is used in various conditions to relieve the pain. It has been studied in various part of the world for its' effective use in arthritis. There are various studies which shows its comparable efficiency with NSAID.

Glucosamine is present in almost all human tissues and is highly concentrated in cartilage and other connective tissues of the human body. Glucosamine is an aminoglycoside, is an intermediate substrate and is highly concentrated in the cartilage and other

connective tissues of the human body. It is needed for glycosaminoglycan and proteoglycan compound of the cartilage.

Glucosamine does not act rapidly. It exerts its effect gradually. In animal studies glucosamine has been demonstrated to stabilize cell membranes. It reduces the generation of oxygen free radical by macrophages and inhibit lysosomal enzymes. It may inhibit the neutrophil and there inhibitory effects.

The glucosamine has shown the beneficial effect on pain in comparison to celecoxib [14]. It has also shown anti-ulcerogenic effect. This

effect is due to its ability to neutralize the hydrochloric acid into the stomach and its capability to strengthen mucosal barrier by increasing mucosal glycoprotein synthesis and its free radical scavenging property [15].

The glucosamine has shown the anti-inflammatory activity in chronic conditions as seen in experimental studies in rats [16]. The glucosamine also has anti-inflammatory effect in acute and subacute conditions [17].

The molecular mechanism behind the pain relieving and anti-inflammatory effect of glucosamine is due to the suppression of LPS induced nitrous oxide expression of Inos and COX-2 and by binding NF-Kappa b. It also does phosphorylation of P38 MAP KINASE [18]. Glucosamine has been evaluated and found to be more effective than a placebo in all trials examined. It is equal to or better than ibuprofen in other trials [19].

CONCLUSION

As previous quoted studies has shown a significant effect of glucosamine over the pain. The glucosamine also has pain relieving effect, by its effect on Cox-2. Previous experimental studies as well as studies [4] on human being has supported this view. Our study has also shown a significant trend towards relief in pain by this nutraceutical agent. Depending on all this and its good anti-ulcerogenic effect, glucosamine should be used for relief in pain for planter fasciitis.

REFERENCES

1. Wearing S. C., Smeathers J. E., Urry S. R., Hennig E. M. and Hills A. P. *Sports Medicine* 2006. 36(7). 585–611p.
2. Moore K. L, Agur A. M. R., Moore K. L. and Agur A. M. R. *Essential Clinical Anatomy*. Philadelphia. Lippincott Williams & Wikins. 1995.
3. Riddle D. L and Schappert S. M. *Foot Ankle Int.* 2004. 25(5). 303–310p.
4. Johnson et al. *Medicine & Sciences in Sports & Exercise*. 2006. 38(5). S87p.
5. Cavanaugh R. et al. *Journal of Biomechanical* 1980. 13(5). 397–406p.
6. Moselay J. B. Jr. Foot & ankle injuries in professional athletes. In: *The Foot & Ankle in Sports*. Louis Mo. Mosby Year Book. 1995. 321–328p.
7. Riddle D. L. Puluric M. et al. *Journal of Bone Joint and Surgery*. 2003. 85A(5). 872–877p.
8. Reid D. C. *Sports Injury Assessment & Rehabilitation*. Churchill Livingstone. 1992. 1131–1158p.
9. Young C. C. et al. *An. Family Physician*. 2001. 63(3). 467–64, 477–478p.
10. De Garceau D. et al. *Foot Ankle Int.*, 2003. 24(3). 251–255p.
11. Stanley K. L. et al. *Clinical Sports Medicine* 1998. 17(2). 375–392p.
12. Digiovanni B. F. et al. *Journal of Bone Joint and Surgery*. 2003. 1270–1277p.
13. Suman K. et al. *Indian Journal of Physiotherapy and Occupational Therapy* 2007. 1(3). 2007–2009p.

14. Savitzke A. D. et al. *Ann. of Rhum. Disease* 2010. 69(8). 1459–1464p.
15. Mannion A. F. et al. *Nature Clinical Practice Rheum.* 2007. 3. 610–618p.
16. S. Santhosh et al. *Journal of Gastroenterology and Hepatology* 2007. 22(6). 949–953p.
17. Kim J. C. et al. *Physiotherapy Res.* 2005. 19(12). 1048–1051p.
18. Glucosamine. *Molecular Nutrition Foods Research* 2007. 51(5). 587–593p.
19. Bruke L. M. *Rhematic Disesease Clinics of North America* 1999. 25(2). 379–395.