

## Comparative study of safety and efficacy of glucosamine in patients of osteoarthritis

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### Abstract

Osteoarthritis is an age related problem which decline in the synthesis of Glucosamine in our body. Due to the reduction in the glucosamine sulphate concentration at joint cartilage ground substance Chondroitin sulphate declines. Hence, the study was aimed to compare the efficacy and safety of Glucosamine sulphate and Placebo control tablets in selected primary Osteoarthritis patients. The randomised, Double blind and Comparative study was carried out with 60 patients in tertiary care teaching Hospital, Coimbatore. Thirty patients in each group as per Inclusion criteria after treatment, which was followed for 5 months. Patients with Glucosamine for 3 months therapy had significant reduction, effectiveness in Swelling joints, Painful joints and Morning stiffness. The duration of walking 50 feet was increased in patients with Glucosamine. The study concludes that Glucosamine shows significant effect in reduction in symptoms and increase the quality of life.

**Keywords:** glucosamine sulphate, chondroitin sulphate, osteoarthritis

### Introduction

Osteoarthritis is one of the most common joint disorder in the world. It is the condition of joints characterised by cartilage loss and evidence of accompanying periarticular response. Osteoarthritis begins with a breakdown of cartilage in the joint resulting in pain and stiffness. It is usually treated by medicines, exercise, and application of heat or cold to the painful joint, use of supportive devices such as crutches or canes and weight control. Surgery may be helpful to relieve pain when other treatment options have not been effective. That's why commonly prescribed NSAIDs and Corticosteroids and Opium analgesics are strictly palliative. Glucosamine is the natural substance found in our body derived from amino acid glutamine. Mostly found in cartilage and required for synthesis of glycolipids, glycoproteins, glycosaminoglycans and collagens. It is essential for the synthesis of new cartilage and synovial fluid. NSAIDs offer purely only symptomatic relief and may actually progress the disease and produce more adverse effects. Glucosamine sulphate was one such cartilage generator of the joint matrix by stimulating the production of Proteoglycans. Hence, the study aimed to compare the efficacy and safety of Glucosamine sulphate with Placebo in patients with Osteoarthritis.

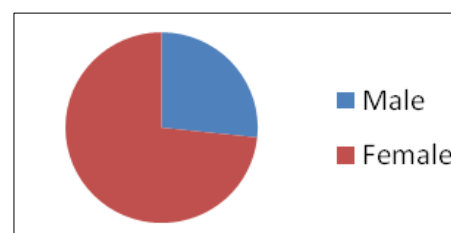
### Methodology

A Placebo controlled, Comparative, Double blind study was conducted with aim of evaluating the efficacy and Safety of Glucosamine sulphate in 60 patients with inclusion criteria. The study was conducted at Coimbatore Medical College and Hospital for the period of 5 months which includes 3 month for

treatment and 2 month for follow-up study. The narrowing of joint cavity was assessed by using Radiographic criteria and functional improvement was evaluated by Lequense index  $\geq 8.0$  and  $\leq 18$ . Other concomitant treatment was prohibited and Paracetamol and Physiotherapy was adopted. Severity of pain was calculated by three point Scale. The data was analysed by using SPSS software and P-value  $\leq 0.005$  was considered as significant.

### Results

A total of 60 patients were enrolled in that study without any dropout, 16 males and 44 females were participated and the gender distribution was given in Figure-1



**Fig 1:** gender distribution of patients

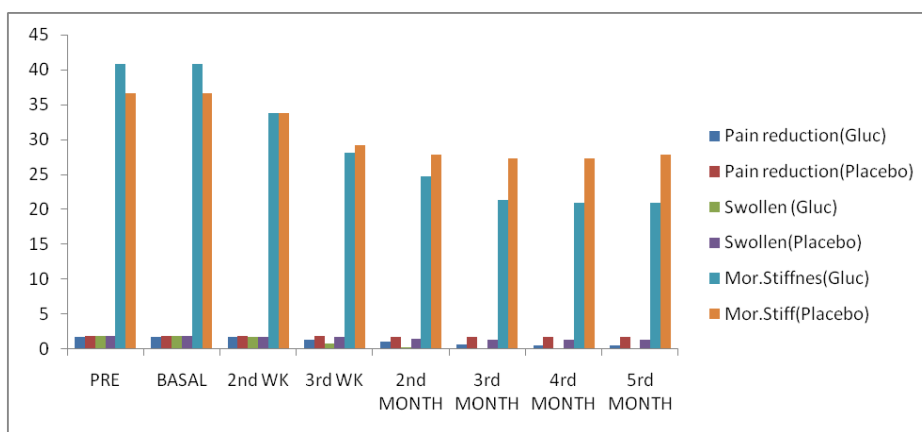
The result indicates that, when compared to Placebo treated patients group, there was a significant reduction in painful joints at Glucosamine treated patients group from 2<sup>nd</sup> week onwards. On 3<sup>rd</sup> month maximum reduction were achieved in Glucosamine treated patients group than Placebo treated patients group. Which was given in Table-1

**Table 1:** reduction of pain in joint

Group	Parameter	3 <sup>rd</sup> Month		5 <sup>th</sup> Month	
		No. of patient	% of patient	No. of patient	% of patient
Glucosamine Group	Excellent	6	10.0	1	1.7
	Good	24	40.0	26	43.3
	Fair	---	---	3	5.0
	Total	30	50.0	30	50.0
Placebo Group	Excellent	--	--	--	--
	Good	1	1.7	2	3.3
	Fair	29	48.3	26	46.7
	Total	30	50.0	30	50.0
Total	Excellent	6	10.0	1	1.7
	Good	25	41.7	28	46.7
	Fair	29	48.3	31	51.7
	Total	60	100.0	60	100.0
X <sup>2</sup>		56.1601		49.0912	
P-Value		P≤0.001		P≤0.001	

The pain and Swelling of joints were assessed but remarkable reduction in Glucosamine sulphate treated patients group

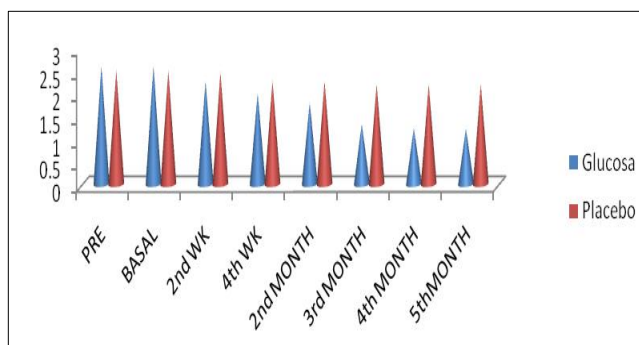
which reached maximum effect in the 2<sup>nd</sup> month which was shown in Figure-2



**Fig 2:** Reduction in swelling joints and morning stiffness

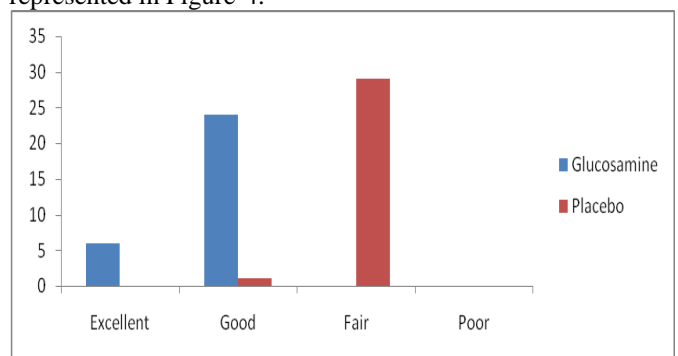
The time taken to walk 50 feet in seconds was improved in Glucosamine sulphate treated patients group. The pain on movement was improved much better and the process continued into the drug free period also. Tenderness of the arthritis reduced in the study. The physical activity was maximised on 4<sup>th</sup> and 5<sup>th</sup> month. That also persist drug free period. This was represented in Figure-3

patients group with high reduction found in 5<sup>th</sup> month. The visual analogue scale also found the same results. The study performed the global assessment at the end of the 3<sup>rd</sup> month and which found excellent effect for Glucosamine sulphate treated group and the Placebo response was fair and represented in Figure-4.



**Fig 3:** Ability to perform physical activities in glucosamine and placebo

The Lequesne index was studied and it shows that, the maximum improvement in the Glucosamine sulphate treated



**Fig 4:** global assessment by the patient at end of 5<sup>th</sup> month

**Discussion**

Osteoarthritis begins with the breakdown of cartilage in joints and results in pain and stiffness and reduces the daily physical activities of the patients. It may be treated with NSAIDs and other Corticosteroids. The study developed the safety profile

of the Glucosamine sulphate by the comparative placebo study method. Several studies have been proved that Glucosaminesulphate is a Chondroitin protective agent that stops progression of cartilage degeneration and stimulates production of new Cartilage. The study also correlates with above results. The Glucosamine treated patients were well improved with reduction in pain, swollen joints and morning stiffness. The Global assessment 4-point scale indicates that, excellent effect in Glucosamine sulphate treated patients and fair results were found in Placebo treated patients at 3<sup>rd</sup> month. The results also evidenced by Laxmi et.al. The Glucosamine sulphate treated patients group had pain score of 10%(n=42) compared to the placebo treated patients group 1.7%(n=01) overall 41% (n=25). The treated patients had a good outcome on Glucosamine sulphate treated patients.

### Conclusion

The study indicates that Glucosamine had substantial benefits in the treatment of Osteoarthritis. The double blind controlled trial conducted with Glucosamine, in which they compared Glucosamine with Placebo. Glucosamine was found to effective and safety when compared to Placebo. The significant changes ( $P \leq 0.005$ ) were seen in physical activity and reduction of pain and swollen joints. The study also Conclude that, Glucosamine is a Safe and effective drug for the treatment of the Osteoarthritis by helping in repair of damaged, eroded Cartilage and synthesis of Glycoproteins. Glucosamine sulphate is one of the drug of choice which also to relieve the pain, swelling and tenderness. There is a significant improvement in the Quality of life in patients.

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