

Efficacy of glucosamine-chondroitin combination (Teraflex) in juvenile temporomandibular joint osteoarthritis: a prospective clinical study

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Keypoints

These findings support the role of glucosamine–chondroitin combination therapy in juvenile TMJ osteoarthritis management.

Abstract

Introduction

Juvenile temporomandibular joint (TMJ) osteoarthritis is a progressive inflammatory–degenerative disorder associated with chronic pain, functional limitation, and reduced quality of life in adolescents. Chondroprotective therapy may provide structural and anti-inflammatory benefits. This study evaluated the efficacy and safety of glucosamine–chondroitin combination (Teraflex) in the complex treatment of juvenile TMJ osteoarthritis.

Materials and Methods

A prospective clinical study included 61 adolescents (aged 16–18 years) diagnosed with juvenile TMJ osteoarthritis. Clinical parameters included pain intensity, mandibular mobility, joint crepitation, physician and patient functional assessment, erythrocyte sedimentation rate (ESR), C-reactive protein (CRP), and polymorphonuclear elastase levels measured using ELISA. Teraflex (500 mg glucosamine hydrochloride + 400 mg chondroitin sulfate) was administered twice daily for 3 months as part of multimodal therapy.

Results

After 3 months, clinical improvement was observed in 94% of patients. Interincisal distance increased significantly, mandibular mobility improved, and joint noises

resolved in 79% of cases. Elastase activity demonstrated a statistically significant decrease ($p < 0.05$). ESR and CRP levels approached normal ranges. No serious adverse effects were recorded.

Conclusions

Glucosamine–chondroitin combination therapy appears to be a safe and effective adjunct in the management of juvenile TMJ osteoarthritis, contributing to functional recovery and reduction of inflammatory activity.

Keywords

temporomandibular joint, juvenile osteoarthritis, glucosamine, chondroitin sulfate, pediatric pain, elastase, chondroprotective therapy

Introduction

Temporomandibular joint (TMJ) disorders represent a significant clinical challenge in pediatric and adolescent populations. Although degenerative joint changes are traditionally associated with aging, increasing evidence indicates that inflammatory–degenerative alterations may occur in younger individuals.

Juvenile TMJ osteoarthritis is characterized by pain, restricted mandibular mobility, joint sounds, and progressive cartilage degradation. Delayed diagnosis may lead to

persistent functional impairment and biochemical changes within the joint environment. Early and comprehensive management is therefore essential.

Cartilage destruction involves lysosomal enzymes from macrophages and neutrophils, particularly elastase, which contributes to proteoglycan degradation. Monitoring elastase activity may provide insight into disease activity.

Chondroprotective agents such as glucosamine and chondroitin sulfate participate in extracellular matrix synthesis and inhibit cartilage degradation. However, data regarding their role in juvenile TMJ osteoarthritis remain limited.

This study aimed to evaluate the clinical and laboratory efficacy of Teraflex in adolescents with juvenile TMJ osteoarthritis.

Materials and Methods

Study Design

Prospective observational clinical study conducted at the Educational Surgical Clinic of Azerbaijan Medical University over a three-year period.

Participants

A total of 61 adolescents (16–18 years):

- 47 females
- 14 males

All were diagnosed with juvenile TMJ osteoarthritis based on clinical, radiological, and laboratory criteria.

Diagnostic Assessment

Patients underwent:

- Detailed medical history
- Clinical dental and occlusal evaluation
- Orthopantomography
- Magnetic resonance imaging (MRI)
- Laboratory assessment (ESR, CRP)
- Measurement of polymorphonuclear elastase using ELISA

Clinical evaluation was based on American College of Rheumatology improvement criteria:

- Bilateral TMJ pain

- Bilateral swelling
- Physician assessment of mandibular mobility
- Patient self-assessment
- Pain intensity
- ESR
- CRP

Treatment Protocol

Teraflex composition:

- Glucosamine hydrochloride – 500 mg
- Chondroitin sodium sulfate – 400 mg

Dosage:

1 capsule twice daily with meals for 3 months.

Patients received multidisciplinary consultation when indicated.

Statistical Analysis

Statistical analysis was performed using SPSS (IBM Corp., USA). Continuous variables were expressed as mean \pm standard deviation (SD). Pre- and post-treatment comparisons were analyzed using paired Student's t-test. A p-value < 0.05 was considered statistically significant.

Results

Clinical Outcomes

After 3 months:

- Increased interincisal distance
- Improved mandibular mobility
- Resolution of joint noises in 79%
- Reduction in 15%
- Absence of periarticular tenderness

Overall outcomes:

- Good: 67%
- Satisfactory: 27%
- Unsatisfactory: 6%

Laboratory Findings

- Significant reduction in elastase activity ($p < 0.05$)
- ESR and CRP approached normal values

No serious adverse events were observed.

Discussion

The TMJ differs from hyaline cartilage joints, being covered predominantly by fibrocartilage rich in type I collagen and relatively low glycosaminoglycan content. These structural differences influence therapeutic response.

Teraflex demonstrated clinical and biochemical benefits, possibly through:

- Modulation of cartilage metabolism
- Reduction of elastase-mediated degradation
- Decreased inflammatory activity

Compared with advanced tissue engineering approaches, glucosamine–chondroitin therapy is cost-effective and accessible.

Study Limitations

- Absence of control group
- Moderate sample size
- Three-month follow-up

Future randomized controlled trials with long-term observation are required.

Conclusions

Teraflex as part of multimodal therapy:

- Improved mandibular function
- Reduced inflammatory biomarkers
- Was well tolerated
- Demonstrated significant improvement by month three

These findings support the role of glucosamine–chondroitin combination therapy in juvenile TMJ osteoarthritis management.

Ethics Approval

The study was conducted in accordance with the Declaration of Helsinki. The research protocol was approved by the Local Ethics Committee of Azerbaijan Medical University (Protocol No. 3 12.11.2025). Written informed consent was obtained from all participants and their legal guardians.

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