
PHYSICAL MEDICINE

CLINICAL USE OF SODIUM HYALURONATE IN TREATING TEMPOROMANDIBULAR JOINT DYSFUNCTION

TEMPOROMANDİBULAR EKLEM DİSFONKSİYONU TEDAVİSİNDE SODYUM HYALURONATIN KLİNİK KULLANIMI

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SUMMARY

This study is planned in order to evaluate the efficacy of sodium hyaluronate in treating certain temporomandibular joint(TMJ) dysfunction. Twenty patients were included the study and were diagnosed as reductible displaced disc (DDR) by means of MRI investigation. They were evaluated by use of intracapsular anamnestic index. They were applied double injections of sodium hyaluronate (15mg/ml) (1ml) into the superior joint space. At the end of the six month observation period, it has been clarified that, difficulty of opening the mouth widely improved in a ratio of 22%, pain during the movement of lower jaw 28%, pain with palpation of TMJ 24% and TMJ sound in 26%. This results show that sodium hyaluronate has been highly recommended for treatment of especially of DDR cases.

Key words : Temporomandibular joint, sodium hyaluronate

ÖZET

Bu çalışma temporomandibular eklem disfonksiyonu olan hastalarda sodyum hyaluronatın etkinliğini değerlendirmek amacıyla planlandı. Çalışmaya MRI yardımı ile redükte edilebilen disk(DDR) tanısı alan toplam 20 hasta dahil edildi.Hastalar intrakapsüler anamnestic indekse göre değerlendirildiler. Hastalara üst eklem boşluğuna bir bafta arayla intraartiküler sodyum hyaluronat enjeksiyonu yapıldı(15mg/ml)(1ml). Altı ay sonraki değerlendirmede hastaların ağzı geniş açmadaki güçlükte %22, alt çene hareketleri sırasındaki ağrı da %28, TME palpasyonu ile oluşan ağrıda %24 ve ses oluşumunda da %26 oranında iyileşme olduğu tespit edildi. Bu sonuçlarla Sodyum hyaluronat uygulanmasının özellikle DDR tanısı alan hastaların tedavisinde etkili olduğunu düşünmekteyiz.

Anahtar sözcükler : Temporomandibular eklem, sodyum hyaluronat

INTRODUCTION

TMJ is composed of two convex structures opposed to each other and placed between the mandible and the skull. It consists of parts of the bony mandible and temporal bones which are covered by cartilage and ligaments. The fibrous articular disc interposed the two synovial cavities of TMJ. In TMJ hyaluronic acid(HA) production and quality play key roles in maintaining joint surfaces and lubricity of synovial membrane(1,2). The diagnosis of TMJ has often been a problem because of its anatomical position and the dependency upon the description of the symptoms by the patient. Definite clinical symptoms of TMJ are headache, facial pain, limi-

tation of mouth opening, clicking and grating sounds. Basic TMJ pathology consists of traumatic disorders(luxation and subluxation), articular disc disease, degenerative osteoarthritis, inflamatory disorders and myofacial pain dysfunction syndrome (1,2)

The elastoviscosity of the synovial fluid of the joint is entirely due to its hyaluronan content. When the normal viscoelasticity of a solid or liquid tissue compartment is decreased, regeneration processes in such tissues are impaired(3). This study is planned in order to investigate the efficacy of HA injection in TMJ disorders.

MATERIAL AND METHOD

Twenty patients who applied to the Physical Therapy outpatient clinic of Dr.M.Ü First Aid and Traumatology Hospital were included in the study. Their ages ranged between 20-71 (mean 37.5). All patients were undertaken a detailed intra-extra oral physical examination by an orofacial surgeon. They were also assessed by means of predisposing factors such as gum chewing, musical instrument playing, nail biting and the others. The degenerative changes were evaluated by radiography. All patients were also diagnosed as having any disc pathology by magnetic resonance imaging(MRI) investigation. Patients who were younger than 18 years old, were applied previous TMJ surgery, were pregnant or to suckle, used narcotic analgesics, had unacceptable systemic conditions and had a prior use of HA into TMJ before, were excluded from the study.

The patients who were diagnosed as reductible displaced disc (DDR) were asked if they had TMJ pain or not. If they had, also its location, severity, character and existence of other symptoms such as dysfunction, sensibility, facial asymmetry, jaw limitation, vertigo, tinnitus were asked. Patients were evaluated by intracapsular anamnestic index. This index included 4 items which are; difficulty of opening the mouth widely, pain during movement of lower jaw, pain owing to palpation over TMJ area and TMJ sound during the movement of lower jaw. These 4 parameters were scored as 0=none, 1=mild, 2=moderate, 3=severe and 4=excessive. The results were evaluated before and after the therapy.

Patients were informed about the injections. After their permission they were applied sodium HA (15mg/mL) (1 ml) injections into the superior joint space of TMJ twice by one week intervals. Patients were evaluated initially and at the 6th month by intracapsular anamnestic index. Wilcoxon test was used as a statistical method for intracapsular anamnestic index.

Table I: Demographic properties of the patients

	n=20
Age	35.9±12.76(18-71)
Gender (F/M)	13/7
Disease duration (month)	6.55±2.86(2-12)

RESULTS

All patients had the HA injections and none had allergic reactions. The demographic properties such as age, gender, duration of symptoms and predisposing factors were presented in Table I.

Among the predisposing factors, clenching or grinding teeth while awake was in 5 patients, biting fingernails in 5, chewing gum frequently in 4, playing musical instruments in 2 and extraction of wisdom teeth in 3 of the patients and seen in Table II.

The results of intracapsular anamnestic index was statistically decreased and the difference of baseline scores and scores at the 6th month were seen in Table III.

According to intracapsular anamnestic index it has been found that difficulty of opening the mouth widely improved in a ratio of 22% (p<0.0001), pain during the movement of lower jaw 28% (p<0.0001), pain with palpation over TMJ 23,5% (p<0.0001) and TMJ sounds 26%(p<0.005) at the end of the therapy (Table III).

Table II: The ratio of predisposing factors

	n=20	%
Teeth clenching	5	25
Gum chewing	4	20
3 rd molar extraction	3	15
Nail biting	5	25
Flute playing	2	10

Table III: The results of the scores intracapsular anamnestic before and after the 6th month of the therapy

	Before treatment	After treatment	%	P
Difficulty opening the mouth widely	40	9	22	<0.0001
Pain on movement of lower jaw	50	14	28	<0.0001
Pain in TMJ by palpation	51	12	24	<0.0001
TMJ sound on movement of jaw	41	11	26	<0.005

These results showed that HA injection had provided a rather remarkable improvement in all parameters.

DISCUSSION

TMJ disorders mainly comprise intraarticular- extraarticular pathologies and sometimes a combination of both of them. Extracapsular disorders generally resides in muscles surrounding the joint. On the contrary intraarticular disorders characterized by TMJ pathology of the articular surfaces or by abnormalities in the mechanical relationship of articular structures(4). Extracapsular disorders generally respond conservative therapies such as heat application, soft diet and exercise therapy. However conservative approaches to treating symptomatic intracapsular disorders are not always successful. Therapies including administration of intraarticular corticosteroid injections and surgery carry significant morbidity and justify the search for improved, low risk approaches for TMJ (5,6).

HA is a high molecular weight polysaccharide and a major natural component of synovial fluid. The importance of HA in the lubrication of synovial tissues has been established but its function in relation to the occurrence of joint diseases is not precisely known(7,8). HA is largely responsible for the viscosity and rheologic properties of normal synovial fluid. HA is a good soft tissue lubricant under loads and has been reported to prevent intraarticular adhesions(9,10). After repeated injections of HA into the joints of experimental animals have been shown to result in only transient infiltration of polymorphonuclear leukocytes, plasma cells and mononuclear macrophage-like cells into the synovial membrane. Under such conditions, HA does not produce clinical signs of inflammation (11,12).

In TMJ intracapsular pathologies, DDR and nonreductable displaced disc(DDN) have an important place and their treatment is of a great difficulty.

Kopp et al investigated the short-term effect of intraarticular injections of sodium HA and corticosteroid on TMJ pain and dysfunction. There was not statistically significant difference between sodium HA and corticosteroids (13). The results of this study indicate that the short-term difference in therapeutic effect between intraarticular sodium HA and corticosteroid is small and insignificant and that HA could be an

alternative to corticosteroid for TMJ pathologies. They also reported the results of the long-terms effects of intraarticular sodium HA, glucocorticoid and saline injections. Sodium HA has been used successfully to alleviate pain and dysfunction of TMJ and might be the best alternative due to the least risk for side effects (13,14). Kopp et al also studied the short-term effects of sodium HA, glucocorticoid and saline injections on rheumatoid arthritis patients with TMJ dysfunction. Glucocorticoid and sodium HA group had a significant positive improvement (15).

Experimental studies indicated that HA has reduced scar tissue formation in wound healing and also reduced the formation of granulation tissue and adhesions.

Bertolami et al studied the efficacy of sodium HA in degenerative TMJ disease(DJD), DDN and DDR. There was no difference in DJD group. The best significant improvement in all parameters was seen in DDR patients (16). In contrast Neo et al treated the osteoarthritic changes of TMJ in the sheep experimentally and reported that HA had a role in preventing the progression of TMJ osteoarthritis (17).

Sato et al examined the disc position and morphology in patients with DDN after the HA injection in TMJ. They found that disc displacement and deformity were continued even the clinical signs and symptoms improved in DDN patients (18).

In our study, like some of the others we found an improvement in the symptoms of the patient with DDR after two injections of HA. It can be concluded that sodium HA has a beneficial effect on subjective symptoms as well as clinical signs of TMJ dysfunction patients. It is a noninvasive and effective treatment modality and also seems to be an alternative therapy to corticosteroid injections.

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