EFFECT OF INTRA-ARTICULAR MORPHINE SULFATE FOLLOWING ARTHROCENTESIS OF THE TEMPOROMANDIBULAR JOINT: A PROSPECTIVE COMPARATIVE STUDY

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ABSTRACT

The objective was to evaluate the effect of intra-articular morphine sulfate injection following arthrocentesis on patients with TMJD.

Thirty patients with refractory TMJD underwent arthrocentesis for the TMJ and were divided into two groups. First group was given morphine sulphate intra-articularly post arthrocentesis, but to the other group no intra-articular medication was given. Patients were evaluated for pain, joint sounds and mouth opening pre and postoperatively.

There was a significant improvement regarding pain scores, mouth opening and joint sounds in both groups. The first group showed more improvement immediately post operatively.

Arthrocentesis of the TMJ is a simple procedure for refractory TMJD cases with significant improvement in symptoms. Morphine sulphate as an intra-articular injection following arthrocentesis further improves the immediate post operative symptoms.

Key Words: Temporomandibular joint, Arthrocentesis, Morphine.

INTRODUCTION

The temporomandibular joint (TMJ) is a compound diarthrodial synovial joint with two compartments and four articulating surfaces. Temporomandibular joint dysfunction (TMJD) is a significant condition that affects 5% of population. The cardinal signs are pain, clicking and limitation of mouth opening. Various nonsurgical and surgical treatment modalities have been described.

Arthrocentesis is a simple, minimally invasive and safe technique for treatment of TMJD by flushing out the TMJ through placing small needles into the upper compartment using local anesthesia and sedation. Ringer’s lactate or physiologic saline are the most commonly used solutions for lavage. The effectiveness of this method can be explained by the joint space expansion achieved with the introduction of fluid and by the washing out of inflammatory mediators and catabolites.

Many researchers have reported the analgesic effect of opioids for the peripheral receptors, however few studies have reported the intra-articular analgesic effects. Morphine sulfate as an intra-articular injection was used in many joints of human body including, TMJ and knee joints with an evidence of sustained analgesic effect without causing histological changes in any of the joint space tissues.

The aim of this study was to evaluate the effect of intra-articular morphine sulfate injection following arthrocentesis on patients with TMJD in comparison with arthrocentesis with no other intra-articular injections.
METHODOLOGY

In the department of oral and maxillofacial surgery at King Hussain Medical Center, between 2011 and 2013 thirty patients (19 female, 11 male) with refractory TMJD underwent arthrocentesis. TMJD was diagnosed using the clinical and radiographical criteria. All patients had undergone prior medical and conservative treatments including NSAIDS, muscle relaxants, bite plates and physiotherapy with no clinical improvement.

The preoperative evaluation for the involved patients included pain upon mouth opening, which was recorded according to the pain visual analogue scale (VAS) score 0-10; presence of joint clicking sounds and maximum mouth opening measured by the maximum inter-incisal distance (MIID).

Arthrocentesis procedures were performed by the same surgeon with the aid of local anesthesia and IV sedation. Nitzan et al’s9 surgical technique was applied in which the first needle was inserted 10mm from the tragus on the cantho-tragus line and 0.5mm below this line. The second needle was inserted 20mm from the tragus and 1mm below it. 19G needles were placed on each point and the joint irrigated with 250cc of normal saline under continuous pressure.

Patients were divided into two groups; In the first one 10mg morphine sulfate was injected intra-articularly immediately at the end of arthrocentesis procedure while in the second group no injections were given. All patients were re-evaluated immediately postoperatively and on the 2nd day, 2nd week, 3rd and 6th month in terms of pain, clicking and limitation of mouth opening.

RESULTS

Thirty patients were involved in this study with a mean age of 21 years. There was a significant decrease in VAS scores at all postoperative intervals (p<0.01), with more improvement presented in the first group for the immediate postoperative VAS scores. However, two patients from the second group reported no pain improvement (Table 1).

Evaluation of mouth opening revealed increased MIID at all postoperative intervals (p<0.01). There was a significant difference between the two groups immediately postoperatively with more improvement in the first group. However, this difference became insignificant at the following postoperative intervals (Table 2).

Joint sounds improved in 8 patients, however 22 patients reported no or minimal improvement. There was no significant difference between the two groups regarding joint sounds.

DISCUSSION

Arthrocentesis was first described by Nitzan et al (1991) as the simplest form of TMJ surgery with low morbidity and low cost compared to other TMJ surgical procedures. It is usually indicated following failure of other non surgical and pharmacological methods of treatment of TMJD. Most common intra-articular injections following arthrocentesis are steroids, NSAIDS and sodium hyaluronate.

In the present study morphine sulfate was used as a post arthrocentesis intra-articular injection. This M-agonist opioids have support for use in moderate to severe pain when administered intra-articularly with minimal side effects, but whether the resultant analgesia is due to local or systemic effect is debatable.

Zunga et al9 studied the analgesic efficacy and safety of intra-articular morphine following arthroplasty and concluded that intra-articular TMJ injection with morphine provide short acting analgesia. A prospective double blind placebo controlled clinical trial was performed in 2010 by Ziegler et al evaluating the analgesic effects of morphine in patients with TMJD, concluded that 10mg morphine sulfate intra-articular injection give the best and long lasting analgesic effect.

In the current study there was a significant difference in both groups between the preoperative and postoperative VAS scores as well as the measurement of mouth opening with improvement of joint sounds. In the first group patients reported more improvement in regard of pain and mouth opening immediately postoperatively.

<table>
<thead>
<tr>
<th>Group</th>
<th>Preop. VAS</th>
<th>Immediate postop. VAS</th>
<th>48 hrs postop. VAS</th>
<th>2 weeks postop. VAS</th>
<th>3 months postop. VAS</th>
<th>6 months postop. VAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>7.3</td>
<td>4.2</td>
<td>3.9</td>
<td>3.5</td>
<td>3.4</td>
<td>3.4</td>
</tr>
<tr>
<td>II</td>
<td>7.2</td>
<td>5.0</td>
<td>4.5</td>
<td>3.8</td>
<td>3.7</td>
<td>3.6</td>
</tr>
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arthrocentesis procedure which support the analge-
sic effect of morphine sulphate as an intra-articular 
medication. The more improvement regarding mouth 
opening may be related also to the analgesic properties 
of morphine which encourage the patients to open more.

CONCLUSION

Arthrocentesis of the TMJ is a simple minimally 
invasive procedure for refractory TMJD cases with sig-
nificant improvement in symptoms. Morphine sulphate 
as an intra-articular injection following arthrocentesis 
future improves the immediate post operative symp-
toms.

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