Research Article

Intra Articular Hyaluronic Acid (Hylan G–F 20) in patients with knee meniscal injuries: A retrospective cohort study

Introduction

Knee meniscal injury is a major cause of morbidity since it restricts patients’ ability to work, to do exercise and to do some daily living activities. Intra articular hyaluronic acid (IAHA) has been approved for the treatment of knee osteoarthritis in human patients with minimal side effects [1]. In animal studies there has been evidence of meniscal lesions healing induced by IAHA [2]. There were however few data in the literature about IAHA in the treatment of knee meniscal injuries and patients’ preferences for surgical or conservative treatment in the management of their meniscal injuries.

The aim of this study was to analyze the IAHA effect on knee pain, stiffness and swelling in patients with the diagnosis of meniscal tear after at least one year of follow up, to determine the percentage of patients who needed surgical treatment and to evaluate patients’ preference of surgery vs conservative treatment of their meniscal tears.

Methods

This was a retrospective cohort study. Medical records of patients who presented to both a primary care sports medicine and musculoskeletal injury clinic in Trinidad and Tobago with a diagnosis of a meniscal injury and who received IAHA between January 2014 and July 2016 were selected from a computer database. This allowed a minimum follow up at least about one year. Duration of relief and patient satisfaction were also studied.

Results: 103 of 156 eligible patients were selected (66%). Sixty three (61.2%) patients had relief of symptoms at least one year after the injection. Mean pain scales decreased from 8.03+/-1.36 at pre-injection moment to 3.34+/-2.58, 14.4+/-1.1 month after injection (p<0.005). Mean satisfaction with the procedure was 3.8+/-.4 on a Likert Scale ranging from 1 (very unsatisfied) to 5 (very satisfied).

Eighty eight (85.4%) of patients would not consider surgical interventions as a first line treatment of their knee injury. Three patients (2.9%) eventually chose knee surgery.

Conclusion: Intra articular hyaluronic acid injections for isolated knee meniscal tears in primary care patients provides relief of symptoms in the majority of cases and is well accepted by these patients. It is recommended as part of the initial treatment options.

Abstract

Aim: To determine the outcomes and satisfaction of patients who presented to a primary care musculoskeletal clinic and sports medicine clinic with a clinical or magnetic resonance imaging confirmation of knee meniscal tear and who subsequently received an injection of intra articular hyaluronic acid.

Methods: This was a retrospective cohort study. Patients presenting to the clinics between January 2014 and July 2016 with an isolated diagnosis of knee meniscal tear and who subsequently received articular hyaluronic acid injection were selected. Evaluation of the pain was done using a numeric scale (0-10) before the injection and at least one year later. Duration of relief and patient satisfaction were also studied.

Results: 103 of 156 eligible patients were selected (66%). Sixty three (61.2%) patients had relief of symptoms at least one year after the injection. Mean pain scales decreased from 8.03+/-1.36 at pre-injection moment to 3.34+/-2.58, 14.4+/-1.1 month after injection (p<0.005). Mean satisfaction with the procedure was 3.8+/-.4 on a Likert Scale ranging from 1 (very unsatisfied) to 5 (very satisfied).

Eighty eight (85.4%) of patients would not consider surgical interventions as a first line treatment of their knee injury. Three patients (2.9%) eventually chose knee surgery.

Conclusion: Intra articular hyaluronic acid injections for isolated knee meniscal tears in primary care patients provides relief of symptoms in the majority of cases and is well accepted by these patients. It is recommended as part of the initial treatment options.
recorded. In addition, compliance with a six week post injection follow up and the clinical findings of the knee examination at this visit were noted. The Numeric Rating Scale (NRS) for pain was used to evaluate pain intensity [3]. Phone numbers were taken from the clinic databases and patients were called by trained phone interviewers. The information that they asked for were current symptoms and pain scales compared to pre-injury levels including what was the outcomes in terms of pain scores, swelling and stiffness. Patients who had physiotherapy sessions and/or surgical treatment after IAHA injection were identified. Patients’ satisfaction with the IAHA injection was evaluated using the Likert scale ranging from 1 (very unsatisfied) to 5 (very satisfied) with a score of 3 representing a neutral response [4]. Patients’ preferences for surgery versus conservative treatment were determined.

The data were then entered into a spread sheet and simple frequencies and cross tabulations were done using SPSS version 20. Cross tabulations between mode of diagnosis (clinical vs MRI) AND time of relief (no relief, 1-12 months and >12 months) and Age (<40, >/= 40 years) versus time of relief were done. Student t test was done for the differences between pre and post pain scores. The level of significance was set at 5%.

Each IAHA injection was of 2 ml. Prior to the injection the skin overlying each patient’s knee was cleaned with 5% iodine solution first and then 70% alcohol skin cleaning solution after. The medial patella injection approach was used where the needle and prefilled syringe unit was inserted behind the medial aspect of the patella and the contents deposited into the knee without resistance. If resistance to flow was encountered while injecting, the needle was repositioned until the resistance was not felt. All patients who received IAHA signed informed consent to receive the injections and all who responded gave consent to use their data for this research paper.

**Results**

A total of 156 patients were screened and called, of whom 103 were contacted and interviewed. The response rate was 66%. The mean period of follow up was 14.4 +/− 1.1 months post injection (range 12–17 months) Twenty five patients (24.7%) had MRI confirmation of diagnosis. The characteristics of the population are shown in Table 1.

All 103 (100%) of patients stated that the meniscal injury had limited their physical activity. When asked about whether they would consider surgical repair of their lesion as a first line treatment, 88 (85.4%) responded “no”, 12 (11.7%) responded that they would only consider surgery if all other non-surgical procedures failed and 3 (2.9%) stated that they would not mind surgery.

Table 2 shows response to IAHA and patient satisfaction.

The change in mean pain scale between before the IAHA injection (8.03 +/−1.36) and after the injection at time of interview (3.14+/−2.58) at a mean time of 14.4 months later was significant at p<0.0005. The change in NPS was shown in Figure 1.

After the IAHA, 35 patients had further treatment. Thirty two (31.1%) patients had physiotherapy and 3 (2.9%) patients had surgery.

Only 31 (30 %) of patients had repeat examination as recommended at 6 weeks post injection. These examination revealed negative clinical test for meniscal injury in 25 (81%) of responders. For cross tabulation, time of relief following IAHA was independent of both patients’ age (chi square=0.81, p=0.67) and diagnosis mode (chi square=5.6, p=0.07).

**Discussion**

This retrospective cohort study showed that at least one year of IAHA injection, about 62 % of the participants were still having significantly less pain. About 13% of patients did not respond at all to IAHA. The reduction of pain was significant

| Characteristic | Frequency (%) |
|----------------|---------------|
| Gender         |               |
| Male           | 61(59.2)      |
| Female         | 42(40.8)      |
| Age            |               |
| <40 years      | 26(25.1)      |
| >/=40 years    | 77(74.8)      |
| Lesion         |               |
| Medial Meniscus| 78(75.7)      |
| Lateral Meniscus| 25(24.3)    |
| Activity level before injury |       |
| Sedentary      | 18(17.3)      |
| Exercise >/= 1 time per week | 17(16.5)  |
| Recreational sport/ amateur sport | 47(43.6) |
| Professional sport | 21(20.6) |
| Number of IAHA injections received | |
| One            | 81(78.6)      |
| Two            | 16(15.5)      |
| >/=3           | 6(5.9)        |

| Question                  | Frequency (%) |
|---------------------------|---------------|
| How long did you get relief after IAHA? |               |
| No relief                 | 14(13.6)      |
| < 6 months                | 16(15.5)      |
| 6-12 months               | 10(9.7)       |
| >12 months                | 63(61.2)      |
| Which symptom(s) changed with the IAHA? |        |
| Decreased pain            | 89(86.4)      |
| Decreased swelling        | 64(52.1)      |
| Increased activity        | 81(78.6)      |
| *patient chose 1 or more responses |           |
| How many symptoms improved with IAHA? |            |
| Three symptom             | 7(6.8)        |
| Two symptoms              | 23(19.4)      |
| One symptom               | 62(50.2)      |
| Level of satisfaction with IAHA |            |
| 1 very unsatisfied        | 13(12.6)      |
| 2 unsatisfied             | 6(5.8)        |
| 3 neither satisfied nor unsatisfied | 14(13.6) |
| 4 satisfied               | 30(29.2)      |
| 5 very satisfied          | 40(38.8)      |
and was independent of whether the meniscal lesion was diagnosed by clinical or MRI exam and of the patients’ age. It has been found that a 2 point reduction in this Numeric Pain Scale to be clinically important [3]. About a 1/3 of patients had to do physiotherapy after the injection but only 3% needed knee surgery. The injection was well received by the patients.

Most patients did not consider surgery as a first line treatment. About 1/10 would try surgery only if all conservative measures failed. A previous study showed that partial meniscectomy followed by supervised physiotherapy treatments was not found to be superior to supervised physiotherapy sessions alone in patients with meniscal tears [5]. It is still unknown the mechanism of action of the IAHA that leads to the resolution or reduction of knee symptoms but it has been found that IAHA has anti-inflammatory, anti oedematous and viscoelastic properties [6]. In addition there has been evidence of enhanced healing of meniscus in rabbits when IAHA injections was compared to saline after arthroscopic or conservative treatment of degenerative medial meniscal tears: a prospective randomized trial. Knee Surg Sports Traumatol Arthrosc. 15: 393-401.

In conclusion, the use of IAHA in patients presenting to primary care musculoskeletal medicine and sports clinics seems to be an effective first line treatment for patients suffering with meniscal tears.

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