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Treatment of Impingement Syndrome in Primary Care

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Abstract **Original Research Article**

Shoulder pain is a common symptom in primary care. Impingement syndrome is one of the most common diagnoses for shoulder pain. The condition is caused by one or more tendons in the rotator cuff being pinched. The diagnosis is often made clinically. Treatment can be pain-relieving tablets, physiotherapy, and/or subacromial corticosteroid injection, depending on the duration of the pain. The purpose of this study was to evaluate the effect of physiotherapy or no treatment compared with corticosteroid treatment, possibly followed by physiotherapy. The research questions were: 1. How does the long-term prognosis [1 year] differ for patients with impingement syndrome treated with corticosteroid injection compared with physiotherapy or no treatment. 2. Are the Swedish National Board of Health and Welfare's treatment recommendations followed, i.e., physiotherapy and corticosteroid injection? The study was conducted as a retrospective medical record review. The study included 92 patients who had sought care at Cityhälsan Söder primary care center in Sweden due to shoulder pain, where the diagnosis after medical examination became impingement syndrome. All included patients were of working age. The patients were divided into two main groups: those who had received one or more corticosteroid injections and those who had not received any corticosteroid injection. The medical records were reviewed for one year forward from the date the patient was diagnosed with impingement syndrome. Patients who had not sought care for the same symptoms more than 1 year after diagnosis were considered cured of the shoulder pain. Those who had persistent symptoms and continued to seek care after one year were not considered cured. The result suggests that corticosteroid injection for patients with impingement syndrome has a favorable effect in the short term. The treatment does not worsen the long-term prognosis. The study indicates that we should continue to offer patients with this condition subacromial corticosteroid injection.

Keywords: Shoulder impingement syndrome, Corticosteroid injection, Physiotherapy, Primary care, Rotator cuff, Retrospective medical record review.

BACKGROUND

Shoulder pain is a common symptom that often leads to a doctor's visit. The prevalence of shoulder pain, according to studies in Sweden, is 7-26 percent [1]. Shoulder pain is the reason for about one percent of all doctor's visits in primary care [1]. Conditions causing shoulder pain on the dominant side can completely reduce work ability for up to 2 weeks [2]. For jobs requiring good mobility in the shoulder joint or tasks performed with the arms above shoulder height, the work ability can be completely reduced for up to 3 weeks [2]. The most common cause of shoulder pain is impingement syndrome [1,3]. In this condition, structures between the skeletal parts acromion and caput humeri [head of the humerus] get pinched, causing movement pain [1].

Anatomy of the Shoulder Joint

The term shoulder joint often refers to the glenohumeral joint. Two bones, the humerus and the scapula [upper arm bone and shoulder blade, respectively], meet at the glenohumeral joint [5]. The other joint in the shoulder is the acromioclavicular joint [5]. The shoulder joint is the most mobile joint in the body. It is stabilized by, among other things, the rotator cuff, which consists of four muscles [1]. These muscles [m. supraspinatus, m. infraspinatus, m. teres minor, and m. subscapularis] originate in the scapula and insert into the head of the upper arm [caput humeri] [1].

CAUSES

Impingement syndrome is a pain condition that affects the rotator cuff, and the condition is sometimes called rotator cuff syndrome [4]. It is caused by one or more of the rotator cuff tendons being pinched [1,4,5]. The cause of the pinching of these tendons can be total or partial tendon rupture, reduced space due to swelling

caused by bursa inflammation [bursitis], or degeneration and swelling of the tendons [1,4,5]. Strong risk factors for impingement syndrome are repetitive shoulder and wrist movements for more than 2 hours per day, as well as working with the hands above shoulder height for more than 1 hour per day [1]. In young people, the cause is often instability in the shoulder joint after a previous trauma [1].

DIAGNOSIS

Clinical examination is necessary for the diagnosis of shoulder pain [1]. Impingement syndrome is often a clinical diagnosis, but X-ray examination can sometimes confirm the diagnosis by showing narrow subacromial space [4]. Two common clinical tests are the painful arc and impingement test [1,4]. In the painful arc, the patient experiences pain during abduction of the shoulder joint between 60-120 degrees [4]. In the impingement test [Hawkin-Kennedy test], the patient's arm is raised forward with the elbow flexed at 90 degrees; horizontally. The examiner passively internally rotates the arm. Pain/reduced mobility indicates impingement [4]. The diagnosis can sometimes be reinforced by injecting a local anesthetic, e.g., lidocaine, subacromially, where immediate pain relief suggests impingement [4].

TREATMENT

The treatment of impingement syndrome consists of physiotherapy, pain-relieving tablets, and subacromial corticosteroid injection according to the recommendations of the Swedish National Board of Health and Welfare, UK management guidelines, and Practical Medicine [2,3,4]. The Swedish National Board of Health and Welfare specifies that pain-relieving tablets and corticosteroid injection are the first choice for short-term symptoms, while physiotherapy and ergonomic advice are the first-line treatment for long-term pain [2]. For persistent long-term symptoms, surgical treatment may also be considered through so-called subacromial decompression [2,6].

According to a British prospective study, corticosteroid injection combined with physiotherapy was cost-effective compared with physiotherapy alone [7]. In another prospective study from USA, two patient groups were compared, where one group received a corticosteroid injection once while the other group received six manipulative physiotherapy treatments [8]. No significant difference was found regarding improvement, but the group that received physiotherapy consumed less healthcare [8]. The study was repeated in the UK [randomized controlled trial where one group received physiotherapy on 6 occasions and the other received corticosteroid injections 1-3 times] with similar results [9].

To the best of our knowledge, there are no published Swedish scientific studies that have evaluated the effect of corticosteroid injection in patients with shoulder impingement syndrome.

Purpose

The purpose was to evaluate the effect of no treatment or physiotherapy compared with corticosteroid treatment, possibly followed by physiotherapy.

Research Questions:

1. How does the long-term prognosis [1 year] differ for patients with impingement syndrome who are treated with corticosteroid injection versus physiotherapy or no treatment.
2. Are the Swedish National Board of Health and Welfare's treatment recommendations followed, i.e., physiotherapy and corticosteroid injection?

MATERIALS AND METHODS

The study was conducted as a retrospective medical record study. Data was retrieved from the medical record system Cambio Cosmic, which is a joint medical record system for the entire Östergötland Region in Sweden. All patients included in the study were listed at the Cityhälsan Söder primary care center in Norrköping. The study included patients who sought care at the primary care center due to shoulder pain and who were diagnosed with impingement syndrome after a medical examination. All included patients were of working age. However, no stratification regarding pain duration was made. There were over 20000 patients listed at Cityhälsan Söder primary healthcare center. According to the prevalence, there were thus at least 1400 patients who suffered from, or have at some point suffered from, shoulder pain.

Patients diagnosed with impingement syndrome within a period of 3 years were included in the study. Some patients were excluded because they had moved to another county council, which made access to their medical records impossible. A few patients were excluded due to questionable diagnosis, where the diagnosis had been changed during another doctor's visit.

The patients were divided into two main groups: those who had received one or more corticosteroid injections and those who had not received any corticosteroid injection. To compare the long-term results of the two treatment options, these two groups were followed for one year forward in time, counted from the date they were diagnosed. Patients who had not sought care for the same symptoms more than 1 year after diagnosis were considered cured of the shoulder pain. Those who had persistent symptoms and continued to seek care after one year were not considered cured. The medical record review covered visits throughout the Östergötland Region, including the other primary care centers, the physiotherapy clinic, and the emergency department, with the exception of certain private

healthcare providers whose medical record registrations are not available in Cosmic.

The variables retrieved from the medical records were:

1. Age at diagnosis
2. Sex
3. Whether the patient received a corticosteroid injection
4. Whether the patient had seen a physiotherapist
5. Whether the patient improved within 1 year
6. Whether the patient was placed on sick leave due to impingement syndrome, and if so, for how long
7. The job task of the patients on sick leave
8. Number of doctor's visits due to the shoulder condition

Ethical Considerations

The study was conducted as a retrospective medical record study. Ethical review was not necessary. No contact was made with the patients, and the study did not lead to any changes in patient management. The manager at Cityhälsan Söder primary care center in Norrköping gave his consent to the study. A quality access log was issued to the author to review the medical records. The information was collected in an anonymized register. The register with complete patient details was saved in a folder that could not be accessed by anyone other than the authors.

RESULTS

A total of 92 patients were studied. The gender distribution was 52 [57%] women and 40 [43%] men. The age range was 22-63 years. The median age was 50.5 years, and the mean age was 50 years. The patients were divided into two groups. The corticosteroid group included patients who had received one or more corticosteroid injections in the shoulder. The non-corticosteroid group included patients who had not received any corticosteroid injection.

The corticosteroid group included 47 patients. The age range was 33-63 years. The median age was 49 years, and the mean age was 50 years. The gender distribution was 25 women [53%] and 22 men [47%]. Nineteen patients in the corticosteroid group [40%] had contact with a physiotherapist. In the corticosteroid group, 42 patients [89%] improved within 1 year. Of the 47 patients in the corticosteroid group, 15 patients [32%] were placed on sick leave due to the diagnosis of impingement syndrome. The mean number of doctor's visits due to the shoulder condition was 2.

The non-corticosteroid group included 45 patients. The age range was 22-62 years. The median age was 52 years, and the mean age was 49. In this group, there were 27 women [60%] and 18 men [40%]. Fifteen patients [33%] in this group had contact with a physiotherapist. Thirty-five [77%] patients in the non-corticosteroid group improved within 1 year. 13 patients [29%] were placed on sick leave. The mean number of doctor's visits was 1.96.

Regarding the distribution of patients on sick leave and physiotherapist contact, 12 sick-listed patients had contact with a physiotherapist [43%] and 16 sick-listed patients did not contact a physiotherapist [57%]. The result showed that contact with a physiotherapist was more frequent in the corticosteroid group [Table 1]. Three patients [12%] in the corticosteroid group underwent surgery with subacromial decompression due to lack of improvement, while no patients in the non-corticosteroid group were operated on. Adherence to the Swedish National Board of Health and Welfare's treatment recommendations regarding physiotherapy for long-term symptoms and corticosteroid injection for short-term symptoms could not be evaluated, as the documentation on whether the symptoms were acute or long-term was inadequate in the records.

Table 1: Distribution regarding physiotherapist visits, improvement, sick leave, and its duration

Group	Patients who visited a physiotherapist [%]	Patients placed on sick leave [%]	Sick leave days [mean]	Patients who improved within 1 year [%]
Corticosteroid [n=47]	40	32	30	89
Non-corticosteroid [n=45]	33	29	67	77
Total [n=92]	**37**	**30**	**48**	**84**

DISCUSSION

The purpose of the study was to examine the long-term effect of subacromial corticosteroid injection in patients with impingement syndrome, as well as to investigate adherence to the Swedish National Board of Health and Welfare's treatment recommendations [2]. This was done by reviewing 92 patient medical records. As the study was conducted retrospectively, it was difficult to find measures for pain and improvement. The fact that the patient had not sought care for the shoulder problem later than 1 year after diagnosis was considered a sign of improvement.

The study gave no indications that corticosteroid injection would worsen the long-term prognosis for impingement syndrome, unlike, for

example, tennis elbow, where studies have shown that corticosteroid injection may be associated with a risk of poorer long-term prognosis [10,11]. The variable that showed the greatest difference between the groups was the duration of sick leave, where those not treated with cortisone had twice as long an average sick leave duration compared to those treated with corticosteroid injection.

It cannot be ruled out that the patients in the corticosteroid group had more pain, which could be the reason they accepted corticosteroid treatment and sought contact with a physiotherapist to a greater extent. This may possibly partly explain the even results between the groups. Perceived pain was not registered with, e.g., the Visual Analog Scale [VAS], and therefore it is not possible to state whether this hypothesis is correct.

The proportion of women in the non-corticosteroid group was 60 percent. This indicates that women possibly had less pain when they first sought care compared to men. It is known from previous studies that women seek care earlier than men [12]. This finding also suggests that the corticosteroid group had more pain already at the first visit. However, other explanations cannot be ruled out, such as men and women receiving different treatments.

The study showed that corticosteroid injection did not result in any difference regarding the long-term prognosis. The study also showed that corticosteroid injection for this patient group did not lead to a worse prognosis in the long term. From clinical experience, however, we know that corticosteroid injection provides rapid relief of pain and increases mobility in the shoulder joint, as well as increasing the chance of returning to work. An American prospective randomized study shows results that confirm this clinical experience [13]. In the American study, patients were divided into two groups. One group received an injection of cortisone plus lidocaine, while the other group received a lidocaine injection without cortisone. Patients in the corticosteroid group showed significantly greater improvement in the short term. In this retrospective study, it was not possible to assess the short-term effect. More randomized studies need to be conducted with this research question.

One of the intentions of the study was to evaluate adherence to the Swedish National Board of Health and Welfare's treatment recommendations regarding whether corticosteroid injection and/or physiotherapy were followed. Due to incomplete information on the duration and severity of the condition, this could not be evaluated. The fact that the recommendations were not always followed could be partly due to the treating physician and partly to the patient's views on the treatment. From personal experience, some patients decline corticosteroid injection, for example, due to fear of side effects.

A weakness in the study was the outcome measure. The patient stopping seeking care does not always mean improvement. Another weakness was the lack of access to medical records at certain private healthcare providers, especially private physiotherapists and orthopedic surgeons. A third weakness was that the patients could not be stratified based on pain duration, which is important for the type of treatment the patient should receive according to the Swedish National Board of Health and Welfare's recommendations.

CONCLUSION

The study showed that subacromial corticosteroid injection for patients with impingement syndrome did not affect the long-term outcome, neither favorably nor unfavorably. However, there was a clear difference regarding the duration of sick leave, in favor of the corticosteroid group. The study could not evaluate adherence to the Swedish National Board of Health and Welfare's treatment recommendations. Prospective randomized studies are needed to more closely examine both the long-term and, especially, the short-term effect of corticosteroid injection. Further studies are also needed to study the efficacy of other treatment methods, e g low level laser therapy, ultrasound therapy and PRP.

Lessons Learned

The topic we chose concerned a common medical condition in primary care. We therefore hope that the study will be important for clinical practice by improving knowledge about the condition and its treatment. We believe that the study suggests that we should use subacromial corticosteroid injection in more patients with impingement, as the injection significantly shortens the duration of sick leave.

One of the most important lessons for us has been the increased ability to review and critique scientific texts. As a clinician, it is easy to get away from the scientific world and become too preoccupied with thoughts about clinical practice. However, it is very important not to lose the ability to interpret scientific texts and to be able to distinguish between results that can be used in everyday life and those that need further study. Research is the foundation of everything we do as clinicians. We therefore believe that we need at least some basic knowledge of research methodology to function as good clinicians.

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