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ORIGINAL ARTICLE

Frequency of Destructive Hip Disease Post Intra-Articular Cortecosteroid Hip Injection

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ABSTRACT

Objective: This study aims to quantify the prevalence of destructive hip disease following intra-articular corticosteroid hip injections.

Study design: A retrospective study

Place and duration of study: Department of Orthopaedic, Khyber Teaching Hospital Peshawar during the period from January, 2022 to June, 2022.

Methods: This study was conducted on two hundred cases of corticosteroid injection treatment. For finding the frequency of destructive hip disease, the radiological imaging was used. Patients were compared with their clinical, paraclinical, and demographic data. Observations of pain, joint mobility, and radiographic evaluation served as the foundation for the recently suggested clinico-radiological diagnostic criteria. The inter- and intraobserver reliability of the radiological grading system was evaluated. For statistical analysis, SPSS-20 was employed..

Results: From the total 200 cases, patients with POH were 80(40%), with RPOH were 20(10%), with femoral head avascular necrosis were 20(10%) and with secondary osteoarthritis of hip were 40(20%), patients went for THA were 90%. There were 30% males and 160% females with mean age of 53.9 ±3.3 and BMI >32. The corticosteroidal injection of 40mg triamcinolone-acetonide with 4 mL 1% lidocaine was placed in 21(77.8%).

Conclusion: An elevated chance of quickly degenerative hip disease can result from intra-articular corticosteroid hip injection. Hip injections with intra-articular corticosteroids are probably not as safe as we had believed. Hip injections should only be used when absolutely necessary, and their usage should be reduced. Before administering a large and repeated dose of corticosteroids, the patient should also be warned about the possibility of the condition progressing faster.

Keywords: RDHD, intra-articular corticosteroid hip injection, frequency.

INTRODUCTION

Quickly progressing osteoarthritis of a hip (RPOH), also called as rapidly damaging arthritis/osteoarthritis/hip illness, is an uncommon ailment that can cause joint deterioration in as short as 6 months to 3 years. Chondrolysis that exceeds 2 mm in a year, or 50percent joint-space constriction in a year,[2] according to Lequesne, is regarded as pathological if there is no sign of other quickly destructive arthropathies such osteonecrosis or Charcot. The first people to observe this occurrence were Postel and Kerboull in 1970[1].

The most prevalent form of arthritis and one of the main causes of impairment in older people is osteoarthritis (OA) [3]. 302 million individuals worldwide are thought to have OA. We now understand that various elements, like as heredity, body mass index, and amount of physical activity, might affect whether a person gets osteoarthritis or not, in addition to age. The most prevalent reason for replacing 1,000 joints (most frequently the hips and knees) per year in the United States is osteoarthritis.

Although non-surgical methods could temporarily reduce symptoms, they are not always successful and might possibly lead to further problems. Non - steroidal pro drugs (NSAIDs) like advil (Advil, others) or naproxen (Aleve, others), or injections of performance-enhancing drugs or hyaluronic acid, may not have been able to reverse a patient's decline in function or persistent pain. These patients may be good surgical candidates (a type of lubricant). Non-pharmaceutical methods that could be useful include weight loss, physiotherapy, and the utilization of aids like canes and braces.

Elderly women often have higher hip RDOA scores according to Kellgren and Laurence (KL) [4, 5], and the disease is more likely to present unilaterally [6, 7]. The real incidence rate, which might be as high as 16% [7], is unknown. Hip RDOA can be caused by a variety of conditions, such as osteopenia and/or decreased bone density [8,9], inversion of the articular surface labrum [10,11], gradual posterolateral pelvic tilt [12], undiagnosed chondrolysis [13], based on inter-deposition of hydroxylapatite or crystalline phosphonates [14-16], and intra-articular pain killers [17,18]. Osteoarthritis in the chest on x-ray and in the patient's subjective report are the initial indicators of RDOA of the hip [20]. Rapid computed tomography advancement is associated with significant femoral head and acetabulum damage, which in turn prolongs surgical operations, necessitating the use of specialised implants, and increases the requirement for blood transfusions [7]. There is conflicting evidence supporting the use of intra-articular steroid injections to relieve hip osteoarthritis pain. In fact, intra-articular steroid injections have been recommended as a successful and affordable method of treating hip osteoarthritis symptoms [21]. Patients with advanced hip oa improved more from these corticosteroid injections compared to those who got a placebo, according to research by Deshmukh et al. [22]. In contrast, a comprehensive study by McCabe et al. [23] discovered that inter-steroid injections, while having low quality data, may cause a modest improvement in feature and short-term pain alleviation. The frequency of destructive hip disease following intra-articular corticosteroid hip injections for diverse hip diseases is unknown.

MATERIAL AND METHODS

This retrospective observational study was conducted as Department of Orthopaedic, Khyber Teaching Hospital Peshawar during the period from January, 2022 to June, 2022 and comprised of 200 cases. Detailed demographics of enrolled cases included age, gender, and BMI were recorded after taking informed written consent. Patient records were

reviewed, and a cohort of individuals with a history of rapid destruction of a hip joint was identified. To narrow the cohort down to just RDHD cases, we ruled out anyone with a diagnosis of infectious, energy metabolism, hormonal, or inflammatory arthritis, prior hip surgery, osteonecrosis, or neurologic disorders. The new suggested clinic-radiological diagnostic criteria for RDHD were developed using patient history, clinical characteristics, and imaging findings. In order to confirm health record and medical evidence with a single time point of radiological monitoring of the hip joint, they were designed. After receiving an intra-acetabular corticosteroid injection, radiographic imaging was used to categorise RDHD. To test for an additive impact, the number of subsequent injections was taken into account. A radiographic examination with the purpose of detecting RDHD was performed at the ages of 6 and 12. Under fluoroscopic supervision, the steroidal combination including the corticosteroid injection was administered into the femoroacetabular-joint. The RDHD diagnosis was confirmed by measuring a gradual loss of cartilage of >2mm and/or a 50% reduction in joint space. Total hip replacement (THA) was considered a secondary objective, whereas the amount of time that had passed since the initial dose and RDHD was the primary endpoint. SPSS 20.0 was utilised for statistical evaluation, and odd ratio analysis and interquartile range (IQR) were the two primary methods used.

RESULTS

The study showed that out of 200 cases, there were 140 (70%) females and 60(30%) males with the mean age of 53.9 ±3.3 years. 20 (10%) cases were given the extra doses of injection. Body mass index greater than 32 indicating obesity was seen in 22 (11%) cases. (Table 1)

Table 1: Patient's characteristics and clinical records

Variables	No.	Percentage
Mean Age (years)	53.9 ±3.3	
Gender Male Female	 60 140	 30 70
BMI >32	22	11
Extra dose of injections	20	10

From a total of 200 cases, 160 patients were diagnosed with RDHD in which patients identified with rapidly progressive osteoarthritis of hip were 20 (10%). While patients identified with primary osteoarthritis of hip were 80 (40%) and the patients identified with osteoarthritis secondary to hip dysplasia were 40(20%). Patients diagnosed with femoral head avascular necrosis were 20 (10%). Patients underwent THA with RDHD were 144 out of 160. (Table 2)

Table 2: Diagnosed distribution of cases and THA after intra-articular corticosteroid injection

Types of RDHD	No.	%
RPOH	20	10
Primary hip OA	80	40
Secondary hip OA	40	20
Femoral head avascular OA	20	10
Progression to THA	144	90
Median time to THA	10.2mo (IQR: 6.5-11.2)	

The newly suggested radiologic grading system and clinic-radiologic diagnostic criteria for quickly degenerative hip disease following intra-articular corticosteroid hip injection were displayed in Table 3.

Table 3: Clinic-radiologic diagnostic standards and a new system of radiologic grading are being developed.

Symptoms	Characteristics for RDHD
Functional joint mobility	Low/moderate limitation
Hip pain	Started approx. 3years ago, variable intensity, worsened in the last 6 to 12 months
Geodes	Present in the femoral head and/or acetabulum
Osteophytes	Absent/reduced
RDHD grading	Radiologic feature
Grade I	Partial joint space narrowing No deformation/ ascension of the femoral head
Grade II	Complete disappearance of the joint space Deformed femoral head and acetabulum Ascension of the femoral head <0.5cm above the radiologic teardrop
Grade III	Complete disappearance of the joint space Partial osteolysis of femoral head Ascension of the femoral head >0.5cm above the radiologic teardrop

In 77.8% of the instances, the steroidal injection was 40 mg triamcinoloneacetonide with 4 mL 1% Lidocaine, whereas in 18.5% of the cases, it was 40 mg triamcinolone-acetonide with 4 mL 0.25% bupivacaine. 3.7% of patients contained less than 40 mg of triamcinolone acetonide. (Table 4).

Table 4: Composition of corticosteroid injection

Injections	No.	%
40-mg triamcinolone acetonide/2 mL 0.25% bupivacaine	1	3.7
40-mg triamcinolone acetonide/4 mL 0.25% bupivacaine	5	18.5
40-mg triamcinolone acetonide/4 mL 1% Lidocaine	21	77.8

DISCUSSION

There is a lack of understanding about the phenomena of rapidly deadly hip disease. It's a painful disorder that causes the femoroacetabular joint to deteriorate quickly, leading to discomfort and a loss of function that necessitates a total hip replacement. Joint space narrowing of more than 50 percent or cartilage loss of more than 2 millimetres over the course of a year in the absence of other kinds of destructive arthropathy are the conventional diagnostic criteria for this ailment, which was first documented in 1957 [26]. There are a wide variety of possible causes, but traditionally it has been regarded as a unilateral syndrome in older ladies with a high KL score at diagnosis [5,6]. Only 20 reports were cited by Pivec et al. [20] in their 2013 review of the literature. In addition, the root causes of RDHD have not been established, and no studies have shown that treatments other than arthroplasty are effective [7,20,27,28].

While non-surgical treatments may be helpful, they are not always effective, seldom result in a complete resolution of the problem, and might have undesirable side effects. Surgical intervention is often reserved for patients who have not responded to noninvasive therapies such painkilling nonsteroidal anti-inflammatory medicines (NSAIDs) like ibuprofen (Advil, others) or diclofenac (Aleve, others) or injection of steroids or hyaluronic (a type of lubricant). Weight loss, physical therapy, and the use of assistive devices like canes and braces are all non-pharmaceutical methods that have shown promise.

Our research aims to contribute to this process and endeavour by developing and proposing a set of practical clinico-radiological diagnostic criteria and a grading system to aid clinicians in the identification of RDHD. These may be made with only a brief examination of the patient's history and physical, as well as a single radiographic examination of the hip, potentially speeding up the treatment process.

Our data imply that after receiving an intra-articular steroid hip injection, 40% of patients will go on to develop primary hip osteoarthritis, 20% will develop secondary hip osteoarthritis, 10% will develop fast progressing osteoarthritis, and 10% will acquire femoral head avascular OA. These

findings are consistent with those from 2018 by Hess et al., who found that 21 percent of patients participated in their study had RDA after receiving steroidal intra-articular hip injections. [29]. Although it is unclear if this is a cause or effect, in most cases, intra-articular injections did not extend the time until arthroplasty. Patients who were older and had a higher KL score at presentation increased their chances of being diagnosed.

Twenty times more likely to develop THA in patients with RDHD compared to those without RDHD. This is because RDHD is associated with a dramatic acceleration of the arthritic process. In addition, instances of RDHD whose THA eventually developed had a short median RDHD duration. Based on our findings, it appears that males and females are related in some way [5,6].

The association between RDHD with intra-articular injection of corticosteroids in the hip has been hotly challenged ever since it was first proposed in the 1990s. This is because RDHD is often linked with other disorders (such as rheumatoid arthritis, chondrocalcinosis, amyloidosis, etc.). After the year 2000, more and more patients with osteoarthritis or osteonecrosis were given IACS injections for pain management and, in theory, to delay the need for a total hip arthroplasty (THA). Recent studies3 have shown that there may be risks connected with these injections, including the counterintuitive danger of hastening the need for arthroplasty. Okike et alresearch .'s confirms these side effects and demonstrates that danger is dose-dependent, therefore at least some of the enigma has been explained. The authors noticed a substantial risk of RDHD following high-dose (>80-mg) triamcinolone injections and several injections, but a low risk following a single low-dose (40-mg) injection.

When less-invasive methods of pain alleviation, such as rest and other conservative therapy techniques, have failed, doctors may resort to intra-articular injection as the most intrusive non-operative treatment option. It's well knowledge that treatment with systemic corticosteroids can cause bone loss, most notably in the hip area through the increased risk of osteonecrosis. It is commonly accepted that corticosteroid injections into a local area are safe, despite the fact that they are chondrotoxic4, likely through effects on cartilage proteins such as aggrecan, type II collagen, and proteoglycan. Hip corticosteroid injections have been linked to a number of negative outcomes, including faster OA development, subchondral insufficiency fracture, and osteonecrosis[30].

REFERENCES

1 Postel M, Kerboull M. Total prosthetic replacement in rapidly destructive arthrosis of the hip joint. Clin Orthop Relat Res 1970;72:138–44.
2 Lequesne M. [Rapid destructive coxarthritis]. Rhumatologie 1970;22:51–63.
3 Neogi, T. (2013). The epidemiology and impact of pain in osteoarthritis. Osteoarthritis Cartilage 21 (9), 1145–1153. doi:10.1016/j.joca.2013.03.018
4 Kellgren JH, Lawrence JS. Radiological assessment of osteo-arthrosis. Ann Rheum Dis 1957;16:494.
5 Rosenberg ZS, Shankman S, Steiner GC, Kastenbaum DK, Norman A, Lazansky MG. Rapid destructive osteoarthritis: clinical, radiographic, and pathologic features. Radiology 1992;182:213.
6 Ledingham J, Dawson S, Preston B, Milligan G, Doherty M. Radiographic progression of hospital referred osteoarthritis of the hip. Ann Rheum Dis 1993;52:263.
7 Batra S, Batra M, McMurtrie A, Sinha A. Rapidly destructive osteoarthritis of the hip joint: a case series. J Orthop Surg Res 2008;3:3.
8 Yamamoto T, Bullough PG. Subchondral insufficiency fracture of the femoral head: a differential diagnosis in acute onset of coxarthrosis in the elderly. Arthritis Rheum 1999;42:2719.
9 Yamamoto T, Bullough PG. The role of subchondral insufficiency fracture in rapid destruction of the hip joint: a preliminary report. Arthritis Rheum 2000;43:2423.
10 Fukui K, Kaneuji A, Fukushima M, Matsumoto T. Inversion of the acetabular labrum triggers rapidly destructive osteoarthritis of the hip: representative case report and proposed etiology. J Arthroplasty 2014;29:2468.
11 Fukui K, Kaneuji A, Fukushima M, Matsumoto T. Early MRI and intraoperative findings in rapidly destructive osteoarthritis of the hip: a case report. Int J Surg Case Rep 2015;8:13.
12 Watanabe W, Itoi E, Yamada S. Early MRI findings of rapidly destructive coxarthrosis. Skeletal Radiol 2002;31:35.
13 Komiya S, Inoue A, Sasaguri Y, Minamitani K, Morimatsu M. Rapidly destructive arthropathy of the hip. Studies on bone resorptive factors in joint fluid with a theory of pathogenesis. Clin Orthop Relat Res 1992:273.
14 Dieppe PA, Doherty M, Macfarlane DG, Hutton CW, Bradfield JW, Watt I. Apatite associated destructive arthritis. Br J Rheumatol 1984;23:84.
15 Dieppe P, Watt I. Crystal deposition in osteoarthritis: an opportunistic event? Clin Rheum Dis 1985;11:367.
16 Martel W, Champion CK, Thompson GR, Carter TL. A roentgenologically distinctive arthropathy in some patients with the pseudogout syndrome. Am J Roentgenol Radium Ther Nucl Med 1970;109:587.
17 Yamamoto T, Schneider R, Iwamoto Y, Bullough P. Rapid destruction of the femoral head after a single intraarticular injection of corticosteroid into the hip joint. J Rheumatol 2006;33:1701.
18 Laroche M, Arlet J, Mazieres B. Osteonecrosis of the femoral and humeral heads after Intraarticular corticosteroid injections. J Rheumatol 1990;17: 549.
19 McCarty DJ, McCarthy G, Carrera G. Intraarticular corticosteroids possibly leading to local osteonecrosis and marrow fat induced synovitis. J Rheumatol 1991;18:1091.
20 Pivec R, Johnson AJ, Harwin SF, Mont MA. Differentiation, diagnosis, and treatment of osteoarthritis, osteonecrosis, and rapidly progressive osteoarthritis. Orthopedics 2013;36:118.
21 Subedi N, Chew NS, Chandramohan M, Scally AJ, Groves C. Effectiveness of fluoroscopy-guided intra-articular steroid injection for hip osteoarthritis. Clin Radiol 2015;70:1276.
22 Deshmukh AJ, Panagopoulos G, Alizadeh A, Rodriguez JA, Klein DA. Intraarticular hip injection: does pain relief correlate with radiographic severity of osteoarthritis? Skeletal Radiol 2011;40:1449.
23 McCabe PS, Maricar N, Parkes MJ, Felson DT, O'Neill TW. The efficacy of intraarticular steroids in hip osteoarthritis: a systematic review. Osteoarthritis Cartilage 2016;24:1509.
24 Forestier F. Coxite rhumatismales subaigues et chnoniques [Thesis]. Paris. 1957.
25 Lequesne M. Rapid destructive coxarthritis. Rhumatologie 1970;22:51
26 Clohisy JC, Carlisle JC, Beaule PE, et al. A systematic approach to the plain radiographic evaluation of the young adult hip. J Bone Joint Surg Am 2008;90:47
27 Richette P. La coxarthrose destructrice rapide. Rev Rhum 2009;76:341.
28 Villoutreix C, Pham T, Tubach F, Dougados M, Ayral X. Intraarticular glucocorticoid injections in rapidly destructive hip osteoarthritis. Joint Bone Spine 2006;73:66.
29 Clohisy JC, Carlisle JC, Beaulé PE. A systematic approach to the plain radiographic evaluation of the young adult hip. J Bone Joint Surg Am 2008;90:47.
30 Kompel AJ, Roemer FW, Murakami AM, Diaz LE, Crema MD, Guermazi A. Intra-articular Corticosteroid Injections in the Hip and Knee: Perhaps Not as Safe as We Thought? Radiology. 2019 Dec;293(3):656-63. Epub 2019 Oct 15