



Safety of total hip replacement following an intra-articular steroid hip injection – An audit

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The aim of this study was to determine the deep infection rates in patients who underwent a total hip replacement after having had a prior diagnostic steroid injection into the same hip.

We identified and reviewed the case notes, relevant radiographs and microbiology reports of all patients who underwent a total hip replacement after a diagnostic steroid hip injection in our unit from 1 January 2007 to 31 April 2009.

There were 40 patients. (10 males and 30 females) Their mean age was 68.4 (52-82) years. The mean time interval from the injection to the joint replacement was 6.2 (2-23) months. The mean follow-up was 23.2 (11-37) months. None of the patients in the study group developed a deep infection during this follow-up period.

Diagnostic intra articular steroid and local anaesthetic injection prior to total hip replacement appears to be safe.

Keywords : hip steroid injection ; total hip arthroplasty ; infection rate.

INTRODUCTION

The role of a diagnostic steroid injection into an osteoarthritic hip prior to a total hip replacement (THR) is controversial (7). Pain felt in the region of the hip joint may originate from the hip joint itself or it may be referred from other anatomical regions such as the lumbar spine. In spite of positive clinical and radiological features of hip osteoarthritis, it

is extremely difficult and often impossible to determine the individual contribution of this joint itself and other sources of pain to the overall discomfort experienced by the patient. In these circumstances it may be logical to think that the extent of pain relief following intra-articular hip injections delineates this joint's contribution to the overall discomfort experienced by the patient and therefore help the patient and the surgeon in deciding whether the patient is going to benefit from a joint replacement surgery. Apart from the diagnostic role, steroid injections can give pain relief in osteoarthritic hips that can delay surgery for a variable period (7,8), although this argument has been questioned by some (3,11). While their role in osteoarthritis is still debated, steroid injections remain as valuable

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adjuncts for inflammation and pain control in patients with inflammatory arthritis of hip joints (6). The potential disadvantage of a steroid injection is the predisposition of the native joint itself or the future arthroplasty surgery to deep infection (5,6). The incidence of iatrogenic infective arthritis of the native hip joint is reported to be in the order of one in 14000-50000 injections (4). Rapid acceleration of cartilage attrition is a real concern, but this is observed very rarely (7). Investigation of primate models has shown no significant long term deleterious effect of steroid on cartilage (7). The evidence for the safety of intra-articular steroid injections into the hip prior to a total hip replacement is still debated and the literature on this subject is controversial (1,5,12,13). We did an audit of our own practice to assess our infection rates and to determine whether it is safe in our circumstances to continue this practice.

PATIENTS AND METHODS

Procedure and follow up

We have been performing diagnostic steroid hip injections in our hip arthroplasty unit for over five years. All these procedures were performed in the orthopaedic laminar flow theatre. A standard procedure was followed in all. The patient lied supine on a radiolucent table, positioned for the image intensifier to take satisfactory anteroposterior hip radiograph. Surgeon wore mask, washed his hands, wore sterile gown and gloves, prepared the skin over the hip with antiseptic povidone iodine or chlorhexidine based on individual preferences and square draped the antero lateral aspect of the hip centred around the midpoint of a line joining the ipsilateral anterior superior iliac spine and the tip of the greater trochanter. Two to five ml of 1% lignocaine was infiltrated on the skin entry site, 2 cm proximal to the tip of the greater trochanter. A long 22 G sterile spinal needle with the trocar *in situ* was then inserted through the skin and underlying soft tissues to puncture the capsule of the hip joint by feel and image control. The trocar was withdrawn and 1-3 ml of the radio-opaque dye omnipaque 300 was injected into the needle to confirm its position within the joint. This was then followed by injection of a mixture of 80-120 mg of Depo-methyl prednisolone and 8-10 ml of 0.5% Bupivacaine into the joint. The patients were allowed to go home after a short period of rest.

They were advised to rest the joint for rest of the day and resume normal activities from the next day. They were also advised to record the pain relief in visual analogue scale (VAS) 1 to 10, 1 hr, 6 hrs, 24 hrs and 7 days following injection and were reviewed back in the clinic in 6-8 weeks.

Data Collection

From October 2005, all theatre procedures done in our hospital are entered on to the centralised theatre database. From this, we identified the details of 254 patients who were coded to have undergone a diagnostic hip injection in our unit from 1 January 2007 to 31 April 2009.

We studied the case records of 240 patients. We could not trace the records of 14 patients. From this cohort, we identified 40 patients who had a steroid and local anaesthetic injection into the hip joint for primary osteoarthritis as a diagnostic procedure who then subsequently went on to receive an ipsilateral Total Hip Replacement. We had decided to exclude those patients with inflammatory arthritis, prior fractures or previous surgeries around the hip.

We reviewed the notes, images (pre and post operative radiographs and bone scans when present) and laboratory (post operative haematology, biochemistry and microbiology swabs when present) reports of all these patients. Data collected included, demographics, co-morbidities, details of the hip injection, details of the hip replacement, suspicion or proof of wound infection and any other complications. These data were entered on to a Microsoft Excel spreadsheet and the results were analysed.

RESULTS

We identified 254 patients who had a hip injection in the study period. Out of these, 40 patients had a diagnostic steroid and local anaesthetic injection followed later on by an ipsilateral total hip replacement. None of these patients had a diagnosis of inflammatory arthritis, previous hip fractures or hip surgery. Among these THRs, 36 were cemented and the remaining four were uncemented. There were 10 males and 30 females. Mean age of the patients was 68.4 (52-82) years. Mean duration from the injection to the joint replacement was 6.2 (2-23) months. The mean follow-up was 23.2 (11-

37) months. Comorbidities included hypertension in 17 patients, coronary artery disease in five patients, valvular heart disease in two patients, atrial fibrillation in two patients, chronic kidney disease in two, cerebrovascular disease and chronic obstructive airway disease in one patient each.

There were no recorded major intra-operative complications. Post operative complications included two dislocations, one limb length discrepancy of more than 1.5cm and four minor wound problems. One patient had an immediate post operative wound discharge that grew *Staphylococcus aureus* from one of the specimens. We treated this as a superficial wound infection. The wound settled down and healed well with intravenous followed by oral antibiotics. Her inflammatory markers always remained low and she did not have any local symptoms afterwards. Her follow-up radiographs were satisfactory. The other three wounds discharged sanguinous fluid possibly due to low molecular weight heparin therapy and settled down after their stoppage for a few days. Two of these wounds were swabbed and both of these did not grow any organisms.

None of the patients in the study group developed a deep infection during this follow-up period.

DISCUSSION

We used a mixture of long acting local anaesthetic and steroid for diagnostic hip injections. One might argue that a local anaesthetic injection alone should have been sufficient for diagnostic purposes. However in the past, we found that with local anaesthetic alone, most patients were unable to give a meaningful feedback about the extent or duration of pain relief when they were reviewed back in the clinic since the local anaesthetic effects are often short lived.

We took full sterile precautions for our diagnostic hip injections and all these procedures were done in a laminar flow theatre setting. The previous studies which suggested that hip injection prior to THR was safe (1,12,13) were also done in similar settings. In one of the two studies that reported a high infection rate, the procedure was performed in a radiology suite by interventional radiologists

who took some sterile precautions (5,9). Studies done on total knee replacement surgery (TKR) for osteoarthritis following steroid injections also give contradicting reports (2,10). In both these studies, steroid injections were performed in the clinic setting undertaking minimal aseptic precautions and no provision for laminar airflow. Whether the higher infection rate seen in one of the hip studies (5) could be attributed to the lack of laminar airflow and hence due to airborne contamination is open to debate.

Previous studies seemed to point that a shorter time interval between a steroid hip injection and THR may be a predisposing factor for infection. Our mean duration between injection and surgery was only 6.2 months. The recent reduction of UK National Health Service waiting lists may be responsible for this shorter interval compared to the reported figures from earlier UK studies. The severity of arthritis or co-morbidities in our cohort was no less or no more challenging than a standard group of patients undergoing a total hip replacement procedure without a prior steroid injection. We did not find any deep infections with a short interval between injection and THR and therefore do not think this is a contributing factor towards deep infection. We are aware of the reported high infection rates of a total hip replacement performed within two months of a steroid injection in one study (9). We are unable to comment on this since the shortest time interval between the two in our study was two months.

We accept the limitations of our audit. First, ours is a retrospective audit. Second, infection following primary THR for osteoarthritis is in the order of 1%. The sample size required to calculate wound infection rates accurately in this cohort will be much higher. It may be extremely difficult to get this high numbers in a single institution, which highlights the importance of prospective multicentre trials. These were suggested in 2005 by Kasper *et al* (5). To date we are not aware of any ongoing trials. In the face of contradicting evidences in hip and knee arthroplasty, we deemed our audit to be absolutely necessary to justify our practice of diagnostic hip injections. We did not select a control group as part of the audit design. Since we did not

find any deep infections in the retrospective audit cohort, we thought it was unnecessary to extend this into a study with a matched control group as the result was obvious and we did not expect the control group to have a higher infection rate compared to our cohort.

CONCLUSION

Our audit lends further strength to the safety of intra-articular injections into the hip prior to a total hip replacement. It also refutes the argument that shorter interval between injection and THR may be associated with increased infection rates.

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