POST OPERATIVE PAIN AFTER HIP SURGERY, IS PROCEDURE SPECIFIC

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ABSTRACT

Objective: To assess the post-operative pain levels in different types of hip surgeries.

Material and Methods: This descriptive prospective study was conducted at department of Orthopedics Khyber Teaching Hospital Peshawar from September 2014 to February 2014. Forty eight patients with different socio-economic background having hip fracture were included in the study coming from different areas of the Khyber Pukhtoon Khaw. Both male and female patients were included irrespective of their age.All the patients were treated according the standardized Hip fractures management protocol. All patients were given I.V fluids and analgesia on admission and prepared for surgery. Same type of I.V analgesia (Inj Ketorolac) was given during peri- and post-operative period to all the patients. Post-operative single I.V analgesia regime was maintained for all the patients. Patients were interviewed on post-operative Day 1 to assess their pain level. Verbal Five-point rating scale was used. Patients were stratified into four groups according to surgical procedure: AO Screws, Dynamic Hip Screw (D.H.S), Dynamic Compression Screw (D.C.S) and Arthroplasty.

Results: Cumulated pain levels were significantly different between surgical procedures. Arthroplasty patients had significantly lower grade of pain than others. Among the hip fracture fixation group, Dynamic Compression Screw (DCS) was more painful than DHS and AO Screws.

Conclusion: Post-operative pain levels after surgery for hip fracture is very much procedure specific, which should be taken into account for post-operative pain management and rehabilitation.

Key Words: Post-operative, Hip fracture, Pain, dynamic hip screw, compression.

INTRODUCTION

At the beginning of the new current millennium, the United States Congress declared the 'Decade of Pain Control and Research'.[1] The potential negative implications of inadequate and/or over-treatment of pain with opioid and non-opioid analgesics negatively impact on recovery after ambulatory surgery.[2] Post-operative pain levels following hip fractures are high during post-operative rehabilitation which could worsen outcome after fracture of the hip.[3,4]

Patients and their care giver must understand how to properly assess the character and intensity of surgery-related pain and the response to the analgesic therapies. Regional analgesia has a promising role in rehabilitation in orthopedic procedures.[5-7] Epidural analgesia minimizes pain after surgery helping in physiotherapy. Similarly, peri-operative regional analgesia has proven its effectiveness in reducing peri-operative morbidity in hip fracture patients.

Hip fracture patients belong to a heterogeneous group treated by a number of methods surgically, including AO Screws, Dynamic hip screw (DHS), Dynamic Compression Screw (DCS), Intra-medullary Screw or arthroplasty according to the fracture type, age of the patient and pre-operative mobility status of the patient.[8,9] Still the management of pain after surgery remains a challenge for many practitioners.[10] Aim of this study was to assess post-operative pain levels in different types of hip surgeries and manage the pain then accordingly to facilitate post-operative rehabilitation.

MATERIAL AND METHODS

Patients admitted with hip fracture to Orthopedics department Khyber Teaching Hospital, Peshawar over a period of 5 months included in the study. All hip fracture patients on arrival were treated with IV fluids, analgesia and prepared for operation. Full Blood Count (FBC), serum electrolytes were checked blood group and save done. Chest x-rays were taken. Electrocardiography (ECG) and echocardiography (Echo) were performed

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for elderly patients or those having underlying cardiac diseases.

Patients underwent different surgical procedures according to the age of the patient, nature and type of the fracture, co-morbidities, pre-fracture mobility status and socio-economic status. Operative procedures like Dynamic Hip Screw (DHS), Dynamic Compression Screw (DCS), AO-Screw fixation and arthroplasty were performed, mostly under spinal anesthesia with perioperative IV analgesia. Post operatively single pain management regimen was used comprising of iv ketorolac (analgesia). On post-operative day 1, every patient was interviewed by the single person on five levels of pain rating scale (1-5) with increasing severity of pain and observations recorded. The pain scale is shown in Table 1.

RESULTS

The total number of patients was 48. Gender distribution among 48 patients was analyzed as n=24 (50%) patients were male while same were female. Patients belonged to different geographical areas of the Khyber Pakhtunkhwa with different socio-economic back grounds. Majority of the patients n=21 (43%) belonged to the age group older than 70 years while n=16 (34%) were in age group b/w 60 and 70 years but only n=4 (8%) were younger than 40 years (Table 1). Fifty percent (50%) of the hip fractures were fixed with Dynamic Hip Screw (DHS), Twenty five percent (25%) with AO –Screws, Sixteen percent (16%) with Dynamic Compression Screw (DCS) and remaining underwent arthroplasty. On post-operative day one the relationship of level of pain with the type of surgery is shown in Table 2.

Table 1: Numeric rating scale for pain

Rating	Pain level
0	No pain
1-3	Mild pain, interfering little with activities of daily living
4-6	Moderate pain, (interfering significantly with activities of daily living)
7-10	Severe pain, (disabling, unable to perform activities of daily living)

On post op day 1 - most of the patients were in level 2 pain on 1-5 verbal pain rating scale. 100% of patients with arthroplasty, 72% with DHS while 33% with AO-Screw fixation had level 2 pain. On the other hand, 50% of the patients with DCS were in Level 3 pain (worse), 28% with DHS and 16% with AO Screw fixation were in the same level of pain but none of the patients with arthroplasty suffered from level 3 pain. Similarly, 50% of the patients with AO Screw fixation were in level 1 pain, 25% with DCS but none of patients with arthroplasty and D H S suffered from this lower level of pain. (Table 3)

DISCUSSION

This study documented that there is significant difference in pain between procedures, with hip arthroplasty and AO Screws having the lowest pain level and DCS and DHS the highest. Previously studies have shown high pain levels after hip fracture surgery with conventional analgesic methods[3]. Recently, in a prospective cohort study, Gerbershagen HU et al observed that 20-40% of the surgical patients experienced severe pain in the first 24 hours of the postoperative period.[11] The characteristics of pain in different group of patients were found to be similar and associated with high levels of anxiety and depression.[12] The primary use of opioids are associated with respiratory depression, sedation, drowsiness, pruritus, skin rash, urinary retention, delayed gastrointestinal motility, postoperative vomiting and nauseated feeling.[13] In other surveys, around 30-40% of physicians and interns considered maximal doses of analgesics for severe pain without considering its side effects.[14] Postoperative epidural analgesia with local anesthetics and low-dose opioids has been documented to reduce post-operative myocardial ischaemia.[15] Improved analgesia and minimized pain as a limiting factor for postoperative rehabilitation.[16]

Bisgaard[17] concluded that a multimodal analgesic regimen consisting of a preoperative single dose of dexamethasone, incisional local anesthetics (at the beginning and/or end of surgery), and continuous treatment with NSAIDs or COX-2 inhibitors during the first 3-4 postoperative days produced the best clinical outcome. Moreover, recent clinical studies suggest that when

Table 2: Post-Op day-1 Pain On Verbal 1-5 Pain Rating Scale

Type of surgery	Level of pain with %ages				
	1	2	3	4	5
AO Screws	6 (50%)	4 (33%)	2 (16%)	Nil	Nil
D.H.S	Nil	17 (72%)	7 (28%)	Nil	Nil
D.C.S	2 (25%)	2 (25%)	4 (50%)	Nil	Nil
Arthroplasty	Nil	4 (100%)	Nil	Nil	Nil

classical NSAIDs or more selective COX-2 inhibiting drugs were administered for 3-5 days after ambulatory surgery, a significant benefit was achieved with respect to clinically relevant patient outcomes (e.g. resumption of normal activities) and improvements in short-term pain control.[18,19] The addition of either acetaminophen (300 mg) or ketorolac (10 mg) to 0.5% lidocaine for intravenous regional anesthesia (IVRA) reduced post-operative pain and analgesic consumption. Thus, the new guidelines proposed at 2012 suggest, as a part of the multimodal analgesia, use of acetaminophen, COXIBs and NSAIDs, should always be considered for acute postoperative pain management. As these agents may be insufficient as a single regimen to treat severe pain but they may be acceptable augmentation to opioids and thus result in a substantial decrease in opioid requirements, which leads to the decrease or possible avoidance of opioid related side effects.[20] Surprisingly, acetaminophen was more effective than ketorolac in shortening the onset time of sensory block and delaying tourniquet pain onset time.[21]

Because of the motor block, limitations in post-operative rehabilitation have not been demonstrated[4]. The risk benefit ratio of regional analgesic methods is dependent on the postoperative pain level of the surgical procedure, so patients with expected low levels of postoperative pain will potentially be in more discomfort by having indwelling catheters, delivery systems plus residual motor or urinary bladder blockade compared with their potential benefits. Therefore, optimal post-operative pain therapy should be procedure specific to minimize unwanted side effects.[12]

In principle, hip fracture fixation with parallel pins or screws is minimally invasive, with low blood loss and small amounts of tissue trauma and leaving the fractured bone in situ intra capsulary. On the other hand, Dynamic Compression Screw (DCS) and Dynamic Hip Screw (DHS) procedures have moderate to high levels of tissue trauma and leaves the fractured bone in situ. Arthroplasty has a larger incision and amount of tissue trauma but essentially removes the fracture site; indirectly eradicating source of pain.[22-24]

There is moderate initial pain levels in elective hip surgery with arthroplasty that quickly tapers off 24 hours after surgery, in contrast with dynamic pain after hip fracture surgery in a mixed cohort of procedures.[25,26] This explains that pain levels after surgery for hip fracture are procedure specific.

In our study we used a standardized perioperative care pathway. However, the study is limited in its size, and the distribution of procedures within the group is skewed–mirroring the daily clinical pattern of procedure. In this study we applied a standardized pain regimen within a standardized perioperative care pathway and as such minimized confounding variables[25,26]. Thus, the pain data for pins/screws are less robust than that for the most common procedures, DHS and DCS. The patients that were included in this study represent the fittest members of the hip fracture population, although there is no evidence to suggest that more fragile patients should have a different distribution of pain according to the procedure type.

The present study has important implications for future studies of perioperative care in hip fractures. Thus, studies of regional analgesic techniques, both neuraxial and peripheral, may have different benefits vs side effects in the different surgical procedures as the relationship between pain relief, facilitating ambulation motor and urinary bladder blockade will be procedure specific. In addition, the optimal duration of regional analgesia could be procedure specific.

CONCLUSION

For postoperative pain therapy and rehabilitation after hip fracture surgery; patients should be categorized according to the surgical technique and fracture type and method of fixation.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under:

Shah SDBA: Concept and design.
Khan TW: Data collection.
Gillani UH: Tabulation, designing
Durrani Z: Overall supervision.
Khan MA: Follow up.
Khan S: Bibliography.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.