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Preoperative Intravenous Tenoxicam for Acute Pain Relief Following Ano-rectal Surgery

By

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Dedication

To the sufferers of postoperative pain

I dedicate this work

Acknowledgement

I am grateful to all those who offered their time and efforts to make this work as useful and accurate as possible. I would like to express my endless thanks and appreciations to my supervisors, **Professor Fahal** and **Mr. Hussein**, Department of Surgery - Faculty of Medicine - University of Khartoum, for their intimate support, and advice throughout the period of conducting the research. I would like to thank **Dr. Hadab** & **Dr. Abd Moneim**, anesthesiologists at Soba University Hospital for their enthusiastic help and supply with up to date literature on this subject. I owe special thanks to all members of the Department of surgery - University of Khartoum, for their valuable comments, suggestions, criticisms and guidance.

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At last but not least may I thank Allah, The Creator, for such a work to be done in a coordinated and organized team.

Abbreviations

AEs	Adverse events
BP	Blood Pressure
C.C	Color Category
COX-2	Cyclo-oxygenase-2
D.O.A	Degree Of Activity
EOA	Epidural Opiate Analgesia
F.D	Face Description
ITU	Intensive Therapy Unit
IM	Intramuscular Platelet factor
min	minute
mm	millimeter
NO	Nitric oxide
NSAID	Non-steroidal anti-inflammatory drugs
ORL	Ootorhinolaryngeology
PCA	Patients Controlled Analgesia
TPR	Temperature, Pulse & Respiratory Rate
VAS	Visual Analogue Scale
VER	Verbal Inquire
VPL	Ventroposterolateral

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Abstract

Background: Postoperative pain relief is often less than optimal, especially for those of minor surgical procedures. The objectives are to test the postoperative pain relief of a preoperative intravenous dose of 40 mg tenoxicam and to investigate its tolerability and safety in patients undergoing minor rectal surgery.

Methods: This study is prospective open one that included 163 patients with different elective & emergent ano-rectal minor conditions. The pain was assessed postoperatively at zero time, four, eight & 24 hours' time. Visual analogue scale, colour category, face description, postoperative mobility and verbal patient view were used to assess pain. The tolerability was investigated by incidence of major adverse event, nausea and bleeding from the operative site. The data obtained were processed using the statistical package of social sciences programme.

Results: The study included 87 patients (53%) in the trial group and 76 patients (47%) were in the placebo group. Patients in the trial group had low measurements of postoperative pain measurements, early motility and more pleasure and that was statistically significant. No patients in the trial group had a major adverse event and all of them had less nausea and postoperative bleeding were less than those seen in the placebo group and that was statistical significant.

Conclusion: The study recommended preoperative intravenous tenoxicam for patients with minor ano-rectal surgery to relieve postoperative pain and minimize the postoperative requirements of opoids.

ملخص الأطروحة

خلفية: إن تخفيف ألم ما بعد العملية الجراحية لا يكاد يكون كافياً لا سيما في العمليات الصغيرة. تقدم هذه الدراسة الألم الذي يتبع عمليات الجراحة في منطقة العجان كنموذج. تهدف الدراسة إلي اختبار مقدرة جرعة التينوكسام الوريدية بمقدار 40 مليجرام عند بداية التخدير و بالتالي أيضاً قياس الاتلئباب عند المرضي ثم تقييم وسائل قياس الألم عند المرضي السودانيين.

الوسائل: اعتمدت هذه الدراسة 163 مريضاً من أمراض العجان الجراحية الخفيفة المختلفة في دراسة متطورة مستقبلية مضبوطة بوجود دواء فاعل و دواء صارف. كان مصدر استيعاب المرضي الحوادث و الاصابات و العيادة المحولة لمرضي المستقيم في مستشفي سوبا الجامعي و مستشفي الخرطوم التعليمي. اعتمد تقييم الألم علي الذاتية من شكوي شفهية و منظر وجه المريض و الموضوعية بقياس المنظور المثالي و درجة تدرج اللون و زمن حركة المريض بعد العملية. تم تقييم المعلومات المجموعة داخل الدراسة الاحصائية المتكاملة للعلوم الاجتماعية.

النتائج: أظفرت النتائج عن 53% من المرضي تعاطو الدواء و 47% تعاطوا الصارف. أظهرت فصيلة العقار مقياساً أقل للألم و حركة بادرة بعد العملية و بدو أكثر رضي بتأكيد بدرجة عالية من التحليل الأحصائي.تم التأكد من مقياس الألم متوخي الدقة في الفصيلتين بالوسائل السالفة الذكر و أيضاً التاكد من صلاحية العقار في جرعة تمت معيارتها مع مقياس درجة الغثيان و النزيف والذي بدا متحداً احصائياً بين فصيلتي العقار و الصارف.

الخلاصة: توصي الدراسة في الختام باستعمار العقار المدروس لتخفيف استعمال مشتقات المورفين في فترة ما بعد العملية و تقصير حدة الألم و تقليل الهذيان و استعجال حركة مريض جراحة العجان.

CHAPTER ONE

INTRODUCTION AND LITERATURE REVIEW

1.1 Introduction

For a number of reasons the relief of acute pain, especially postoperative pain, is often less than optimal. The observation in our hospitals is that there is maximal care in patients with major surgical intervention, especially those who are nursed in the intensive therapy unit and those with thoracic or upper abdominal incisions. Patients with minor procedures that kept in the ward are left only with the usual dose of 50 mg intramuscular pethidine at full recovery. Patients with anal conditions are even succumbing from lack of follow up of their pain. In the UK, the adoption of techniques such as PCA, Patient Controlled Analgesia, and EOA, Epidural Opiate Analgesia, has been tempered by fears of severe respiratory depression and the lack of identifiable individual or group with the responsibility for the relief of acute pain[(1)].

This situation has been compounded by a general lack of understanding of pharmacology and pharmacokinetics of opoids. In addition, there has been a failure to appreciate the potential risks of conventional intra muscular analgesia and psychological and physiological consequences of inadequate analgesia. In our set up we are in great need of preoperative analgesia to avoid the problems of

infrequent follow up and unnecessary delay and side effects of parentral administration of opioids[1].

1.2 Pathways of Pain

1.2.1 Pain and Nociception: The integrative action of the nervous system is still a mystery. What is surprising is how little the conceptual ideas about pain mechanisms changed over most of that period, and how much they have changed in the last few years.Pain appears the psychical adjunct to protective reflexes. Pain is envisaged as an alarm system, triggered by stimuli which threaten or damage the body, and drive avoidance behavior. It has been postulated that the existence of nociceptors, sensory neurons that would not respond to normal physiological events or innocuous stimuli, but would be recruited specifically by immediate threats [2]. Researchers sought and found evidence for just such a population of afferent neurons, initially in skin and then in deep somatic tissues. It is because of the technical support in making recordings from these thin fibres conducting in the Ad and C range of velocities. These findings were seen as vindicating the so-called specificity theory, over its rival, the pattern theory which proposed that sensory information was encoded in a combinatorial way in groups of broadly tuned afferent neurons. Parenthetically, recent work on the properties of sensory neurons innervating visceral tissues suggests that specific nociceptors are very rare in many organs, and rather that noxious events are

mostly signaled by 'intensity-encoding' neurons that respond to innocuous physiological stimuli and, with a higher frequency of action potential discharge, to noxious ones[(2)].

The idea of a specific pathway for pain was by most writers implicitly applied also to the central nervous system. The Gate Control theory of Melzack and Wall was the first serious challenge to the specific pathway theory. This theory emphasized that pain was a subjective experience, dependent on the context in which it occurred and, therefore, modifiable by other events. It is proposed that the activity of large diameter innocuous afferents would modify or inhibit the central transmission of information carried by small diameter fibers [(2)].

The mechanisms of acute pain might differ substantively from those of chronic which are called pathophysiological pain. It is not so much that earlier facts have been refuted, but rather that their applicability to clinically relevant pain states has been challenged. What has become very clear is that the signaling system is itself strongly modified by the very injury that it reports upon. An informed consent to assess a patient is essential for mental competence of the patient and adequacy of information provided [(3)].

This plasticity in the injury-signaling system is being intensively studied at two loci: firstly, at the peripheral terminals of nociceptors; secondly, at the first

central site of processing, in the posterior horn of the spinal cord. The changes at these sites are generally referred to as peripheral and central sensitization, respectively [(2)].

Peripheral sensitization, as its name implies, relates to an increase in the sensitivity of the peripheral endings of nociceptors. One new development, however, has been the description of a novel class of nociceptors that is not activated by traditional noxious stimuli like excessive mechanical or thermal stimuli, but which is recruited when tissue becomes inflamed. These sensory neurons have been dubbed 'silent afferents', 'sleeping nociceptors' and, rather more prosaically, 'mechanically insensitive afferents'. In the presence of tissue injury, some of these fibers become mechanosensitive and this is likely to constitute an important new source of afferent barrage. Alongside traditional mediators such as bradykinin, prostaglandins, and serotonin, evidence is growing for the involvement of new molecules—cytokines and growth factors, such as tumor necrosis factor (TNF) and nerve growth factor (NGF) [(2)].

The second major area of current interest is that of central sensitization. The basis of this phenomenon is that repetitive activity in unmyelinated primary sensory neurons is capable of producing a long-lasting facilitation in the responsiveness of the neurons in the spinal cord that process nociceptive information, which includes a lowering of the threshold of peripheral stimuli

necessary to excite the cells. Central sensitization appears to be a very general phenomenon, and has been seen in a large number of models of persistent pain and under a wide variety of conditions. Once recruited, however, it allows Ca2+ to enter the postsynaptic cell, and this in turn triggers a cascade of change that maintains the central hyper excitable state. One of the second messengers activated by the increased intracellular Ca2+ levels under these conditions is nitric oxide (NO), a diffusible transmitter the production of which also appears to be critical for the development of central sensitization.

This new knowledge is changing the emphasis of those interested in developing therapies to help treat patients in pain. Instead of seeking analgesic drugs which blocks injury-related neuronal signals at some point, there is a great opportunity to develop a new class of agents that are actually antihyperalgesic. Such drugs will hopefully restore the signaling system to its normal level of excitability. Therefore they retain the protective features of the pain signaling system [(4).]

1.2.2 Comparison of the Dorsal Column–Medial Lemniscuses Complex with the Spinothalamic Path: The transmission of impulses through the dorsal column–medial lemniscuses pathway is subjected to a variety of control mechanisms. Stimulation of the sensory–motor cortex also modulates the transmission of impulses by both pre- and postsynaptic inhibitory mechanisms, and sometimes by facilitation. These descending influences are mediated by the

corticospinal tract. Modulation of transmission by inhibition also results from stimulation of the reticular formation, raphe nuclei and other sites. The dorsal column have been pictured as a highly reliable telephone system in which afferent information is separated in channels which are discrete both for spatial origin and stimulus specificity. In this the dorsal columns strongly contrast with the spinothalamic tracts [(5)].

Neurons of the spinothalamic tract have very different receptive fields. Specificity of separate channels, as it exists in the dorsal column nuclei, is absent in the laminae of the cord. Convergence of different functional types of afferent fibers onto an individual tract cell is a common feature in the cord. On the basis of laminar site, functional properties and specific thalamic termination of their axons, spinothalamic tract neurons may be divided into three separate groups, namely: apical cells of the dorsal grey column, deep dorsal column cells and cells in the ventral grey column.

Spinothlamic tract units project to either the ventroposterolateral (VPL) nucleus or to the Centrolateral nucleus of the thalamus, and sometimes to both nuclei. Units projecting to the ventroposterolateral nucleus receive input from all classes (A-b, A-d and C) of cutaneous fibers.

Ventral grey column spinothalamic tract cells respond mainly to deep somatic (muscle and joint) stimuli, but also to innocuous and/or noxious cutaneous stimuli. In the thoracic regions of the spinal cord they also receive convergent input from visceral sources. The majority of spinothalamic tract neurons have large, complex receptive fields (often bilateral) which encompass widespread areas of the body. Cells of this group that project exclusively to the medial thalamus receive input from A–b, A-d, and C classes of afferent fibers, and many respond to convergent input from receptors of deep structures. These neurons were found to comprise 25% wide diframic range, 63% high threshold, and 12% low threshold or deep type. Most of the spinothalamic tract cells in the ventral grey column project to the intralaminar nuclei of the thalamus [2, 4, and 6].

The wide dynamic range type neurons are particularly effective for the discrimination of different intensities of painful stimulation. Furthermore, it is suggested that the spinothalamic projection to the ventroposterolateral nucleus is concerned with the discriminative aspects of pain perception, whereas the projection to other thalamic regions, particularly the intralaminar nuclei, may be involved in arousal and/or aversive behavior [2].

The control of impulse transmission is modulated in a variety of ways. First, the cutaneous afferents are influenced by a tonic regulating mechanism in the substantia gelatinosa described previously; additionally, transmission is

influenced by a variety of descending fibers from the sensory–motor cortex and brainstem centers.

The roles of dorsal columns and spinothalamic tracts have aroused much controversy [5].

1.3 Physiology of Pain:

There is considerable evidence that sensory stimuli are perceived in the absence of the cerebral cortex, and this is especially true of pain. The cortical receiving areas are apparently concerned with the discriminative, exact, and meaningful interpretation of pain, but perception alone does not require a cortex.

1.3.1 Deep pain and adequate stimulus: The pain difference between superficial and deep sensibility is the different nature of the pain evoked by noxious stimuli. Unlike superficial pain, deep pain is poorly localized, nauseating and frequently associated with sweating and changes in the blood pressure. Pain can be elicited experimentally from the periosteum and ligaments by injecting hypertonic saline into them. The pain produced in this fashion initiates reflex contraction of nearby skeletal muscles. This reflex contraction is similar to the muscle spasm associated with injuries to the bones, tendons and joints. The steadily contracting muscles become ischemic stimulating pain receptors in them. The pain in turn initiates more spasm, setting up a vicious

circle [6].

Pain receptors are specific and pain is not produced by stimulation of other receptors. On the other hand, the adequate stimulus for pain receptors is not as specific as that for others, because they can be stimulated by a variety of strong stimuli. For example, pain receptors respond to warmth, but it has been calculated that their threshold for thermal energy is over 100 times that of the warmth receptors. Pain receptors also respond to electrical, mechanical, and especially chemical energy.

It has been suggested that pain is chemically mediated and that stimuli which provoke it have in common the ability to liberate a chemical agent that stimulates the nerve endings. The chemical agent might be a kinin or histamine, both of which cause pain on local injection [7].

1.3.2 Hyperalgesia: In pathologic conditions, the sensitivity of the pain receptors is altered. There are two important types of alterations, primary and secondary hyperalgesia. In an area surrounding an inflamed or injured area, the threshold for pain is lowered so that the trivial stimuli cause pain. This phenomenon, the primary hyperalgesia, is seen around the area of the flare, the region of vasodilatation around the injured area. In the area of actual tissue damage, the vasodilatation and presumably the pain is due to substances liberated from injured cells, but the flare in the surrounding undamaged tissue is

due to substance P liberated by antidromic impulses in the primary afferent fibers. Some nerve injuries cause hyperalgesia, and these are associated with an increase number of substance be receptors in the spinal cord on the side of injury [8].

Another aberration of sensation following injury is secondary hyperalgesia. In an area affected, the threshold for pain is actually elevated, but the pain produced is unpleasant, prolonged and severe. The area from which this response is obtained extends well beyond the site of injury, and the condition does not last as long as primary hyperalgesia. It is probably due to some sort of central facilitation by impulses from the injured area of the pathway responsible for the unpleasant affect component of pain. Such facilitation or alteration of pathways may be spinal subliminal fringe effect or it may occur at the thalamic or cortical level [6].

1.4 Pain Assessment

1.4.1 Acute Pain Service: This is to appreciate the potential risks of conventional intra muscular analgesia and psychological and physiological consequences of inadequate analgesia. This leads to the development of acute pain service.. The team comprises consultant anesthetist, senior pharmacist, ITU sister and staff nurse [1].

The aims of this are responsibility for the day to day management of acute pain, organization of services to ensure that the level of care and monitoring is

appropriate both for clinical condition of the patient and the technique employed, provision of in-service training in the areas of pain assessment, principles of PCA and EOA, diagnosis and management of the complications and hazards of particular forms of treatment, audit outcomes of existing methods and evaluation of new techniques, giving information feedback as appropriate and clinical research into the relief of acute pain [1, 3].

1.4.2 The basic idea of charting; This is considered to be suitable for use on any patient with acute severe pain especially postoperative pain. The drugs given should be written on the 'as required and variable dose' portion of the medication chart. Morphine Omnopon or Pethidine should be prescribed in doses related to the weight of patients.

Prescriptions should allow one hourly administration according to instructions on the intramuscular analgesia flow chart.

PRN has little meaning and its use is discouraged unless there are expectations of severe pain, for this it should be, but should be included together with systolic blood pressure [4].

In postoperative patients, pain charts should be started in the recovery ward, and should accompany the patient back to the ward [9].

Observations made by the ward staff continued on this chart including TPR and BP Chart

For the patients admitted with pain and waiting surgery, their charts should accompany them into the theatre with a continuous record of observations and treatment (base-line).

Scores of pain assessment and sedation level are described on the observation chart. These should be assessed and charted along with temperature, pulse, blood pressure, respiratory rates [(8)]. If pain scores are found to be 2 or 3 then follow instructions on the flow chart to give intramuscular analgesia. Record when intramuscular injection given and build up nausea score. Anti-emetics are given according to nausea scores and if there is nausea or vomiting [(1)].

The simple chart is easy to use in practice, although less accurate for the research.

The respiratory rate is counted while the patient is at rest for one minute. Sedation score is applied by looking for the patient and deciding: Difficult to waken 3, mostly sleeping 2, dozing intermittently 1 and awake Verbal assessment of pain is the simpler and just an answer to questioning the patient ‘which word describes best the pain you have now, severe, moderate, mild and no pain’.

Other variety is no pain at rest and movement, slight pain on movement but no pain at rest, intermittent pain on rest (few problems while doing most things) A and moderate pain on movement (many difficulties while stopping some

activities considered) B and continuous pain on rest (disability with stopping normal activities) C and severe pain at rest (no control) D [1]. Face description and postoperative pleasure are subjective methods and are used only in research with restriction [1, 9].

1.4.3 VISUAL ANALOG SCALES (VAS): To allow a continuous assessment of pain, VAS uses a 10 cm line labeled at '0' with 'no pain' and '10' with 'worst pain'. The line is marked at a point corresponding to the assessment of the pain. The distance of the mark from zero is measured (9).

Example of a VAS

VAS has also be used to assess the severity of wounds, degree of lameness, activity levels.

it has been demonstrated how VAS could be used in a field trial to show that pain resulting from rubber ring castration could be significantly reduced by the use of local anaesthesia or crushing the nerves to the scrotum and testes.

Videos of the lambs in the validation experiment can also be used to show that experience of assessing pain increased the accuracy with which individuals assess pain using VAS [10].

1.4.3.1 VAS usage in Research: The VAS pain scale is a powerful research tool in the field of pain research. Visual analog scales are one of the most frequently used measurement scales in health care research. The VAS is most commonly known and used for measurement of pain.1, 2, 3 However; it can be used to measure the perception of a variety of stimuli, such as emotional distress and nausea4, quality of voice samples5, and recall and recognition of material in an educational presentation6. Despite the popularity of the VAS, it is sometimes misused. This is the first in a series on the visual analog scale [10].

Visual Analog Scales measure the intensity or magnitude of sensations and subjective feelings, and the relative strength of attitudes and opinions about specific stimuli [11].

It is important that the use of the scale be explained to each subject. The instruction that should be written above the scale is to put a mark on the line at the point that best describes how much pain the patient has at the moment. One should notice that what is being measured is the perception at the moment, not a comparison such as, what is the pain compared to what had been before. The

scoring measures in millimeters from the low end of the scale to the subject mark. This is interval level data [12].

1.4.3.2 VAS and Data Analysis: The reliability and validity of the scale should be evaluated each time it is used with a new group or situation. Reliability, internal consistency can be assessed by developing more than one VAS scale to measure the same concept but using different words; e.g. no pain at all - worst possible pain, intense pain - no pain. Assess test-retest reliability only if the variable measured is a stable trait, does not change over time, the repeat assessment is done within a short time interval, and the situation has not changed. Reliability is not assessed by asking the subject to recall an earlier sensation; memory is faulty. Interpreter reliability is assessing if scoring, manual measurement of the line is being done by more than one person; a random sampling of measurements can be used. Validity can be examined by using a different established and valid instrument, such as a verbal descriptor scale, to measure the same concept at the same time the VAS is used. There should be a high correlation between the results on the two different methods [9].

The visual analogue pain intensity scale answers what is moderate pain in millimeters. One way to ensure adequate sensitivity for analgesic trials is to test the intervention on patients who have established pain of moderate to severe intensity. The usual criterion is at least moderate pain on a categorical pain

intensity scale. The visual analogue scales are the only pain measure in trials to know what point on a VAS represents moderate pain. This is if patient records a baseline VAS score in excess of 30 mm he has recorded at least moderate pain on a 4-point categorical scale [12].

The age, sex and cause of pain are found to bear no significant difference in minimum clinically significant difference in VAS pain score for each of these variables [11].

1.4.3.3 Other Methods of Pain Assessment: These include coloured laddered category and face description, both of them needs pre-designed forms. Patient's view on the degree of pain in simple words, satisfaction about analgesia, degree of activity and mobilization are subjective and used only in research [13].

1.5 The pain of haemorrhoidectomy

Ligation excision haemorrhoidectomy has a reputation of producing severe pain. It is the most commonly performed operation for prolapsing haemorrhoids. Traditionally patients have remained in hospital until the first postoperative bowel action, a time where parental opioids is ususlly administered [13].

Recent trends towards earlier hospital discharge have led to re-evaluation of post-haemorrhoidectomy analgesia and introduction of innovative analgesic options. These include the use of a subcutaneous morphine pump, transdermal

fentanyl and intrasphincteric ketorolac administration. Regimens such as these have allowed haemorrhoidectomy to be performed as day surgery. However many of these analgesic options are expensive and require sophisticated equipments [14].

A more suitable alternative may be to use a postoperative pain management plan using a multimodal analgesic technique using the commonly available medications like simple analgesics and delivery system [15].

Recovery from surgical haemorrhoidectomy may be very painful particularly at the time of the first postoperative bowel action. In this series, a wide variation of the postoperative pain is seen. Pain is well controlled using a multimodal analgesic approach. Multi-modal analgesia, a combination of two or more drugs, has shown benefit after surgery [15, 16].

In particular the benefits of combining NSAIDS, local anaesthesia and opoids are well-recognized. The success of the pain management approach on this series reflected in the low mean pain scores and high level of patient satisfaction. The pain is expected to be higher in the second postoperative day due to the early analgesic effect of the pre-emptive local anesthetic block. This is thought to inhibit peripheral nociceptive responses and prevent altered central that amplifies postoperative pain [17, 18].

Infiltration of local anaesthesia for haemorrhoidectomy is controversial.

Bupivacaine confers no advantage [18]. Caudal injection of bupivacaine is superior to local injection, with patients experiencing less pain six hours after surgery [19]. However not all patients are suitable for caudal analgesia. Failure rates of 5-10% and delayed ambulation have been reported. Spinal anaesthesia has been associated with a higher incidence of urinary retention compared with local infiltration [20]. Lignocaine as local infiltration has a great advantage even when is combined with general anaesthesia to prolong analgesia [21].

In an effort to optimize patient advantages of early pain control in this series, local anaesthesia is infiltrated into the wound as well as ischiorectal fossae [22]. The local anesthetic thus interrupts the inferior hemorrhoidal nerve and the perineal branch of the fourth sacral nerve on each side. It should provide paralysis of the external sphincter and decreased sensation in the anal canal [23]. This is only avoided when intravenous tenoxicam is given which is proved to be as efficient as that in the early postoperative period [24].

The addition of this local block appears to confer specific advantages following haemorrhoidectomy, as the patients had low initial pain scores and analgesic requirements. [25].

Increased pain in the fifth postoperative day is unexpected and believed to be due to infection; for metronidazole reduces pain on day 5 – 7 after surgery [26].

1.6 Tenoxicam (Tilcotil)

Tenoxicam is thienothiazine-derivative that belongs to the chemical class of oxicams. The injectable form contains 0.4 mg ascorbic acid, disodium EDTA, mannitol, tris(hydroxymethyl)amino methane and water for injection.

1.6.1 Effects: It has anti-inflammatory, analgesic, antipyretic properties and platelet inhibiting effect. It is a potent inhibitor of prostaglandin biosynthesis, both in vitro and in vivo. In vitro tests of leucocyte peroxidase suggest that tenoxicam may act as scavenger for active oxygen at the site of inflammation. These effects explain, at least in part, the suitable use of the drug in the treatment of painful, inflammatory and degenerative disorders disorders. It shows no mutagenic, carcinogenic or teratogenic effects in animals. As with other prostaglandin inhibitors, renal and gastrointestinal effects, increased incidence of dystocia & delayed parturition were observed in animal safety studies [(27)].

1.6.2 Pharmacokinetics: On extravascular administration tenoxicam is absorbed in unchanged form: an oral drug is absorbed completely where as absorption after rectal administration is 80%. Peak plasma concentration is reached within two hours in fasting subjects. If it is taken orally with meals, its absorption is the same, but at a slower rate.

Following the intravenous administration of 20 mg tenoxicam, the plasma levels decline rapidly during the first two hours mainly due to the distribution

processes. During this short period, there is no difference in the plasma concentration between the oral and intravenous routes. Following intramuscular administration, the levels at or above the 90% of the maximally achieved concentrations are reached as early as 15 minutes after a dose, this earlier than the oral dose. The bioavailability is complete with the muscular dose and indistinguishable from that administered orally.

In the blood after 99% of the drug is bound to albumin. Tenoxicam penetrates well in the synovial fluid, but peak concentrations are reached later than the plasma.

At the recommended dosage of 20 mg once daily, via any route, steady state conditions are reached within 10 - 15 days without unexpected accumulation. The maximum steady-state concentrations in the plasma amount to 10 -15 microgram per ml, and did not change even on treatment for up to two years [(27)].

The major part of Tenoxicam is converted to inactive metabolite 5-hydroxypyridyl. Other metabolites occur in the form of glucuronidated compounds. Tenoxicam is eliminated with an average half - life of a range of 42 to 98 hours. Up to two-thirds of the oral dosage is excreted in the urine and the rest in the bile. Pharmacokinetics in special situations Studies in elderly and in patients with renal insufficiency or liver cirrhosis suggest that no dose adjustment is necessary to achieve plasma concentrations similar to those in

healthy subjects. Because of high plasma protein binding of tenoxicam, caution is required when plasma albumin levels are markedly reduced as in nephrotic syndrome [28].

1.6.3 Dosage & administrations: For all indications except gouty arthritis, a daily dosage of 20 mg should be given at the same time of day. Where indicated, treatment may be initiated with IV or IM 20 mg Tenoxicam for one or two days. Although the therapeutic effect of tenoxicam is evident early in treatment, there is progressive increase in response over the first two weeks until steady-state plasma level is reached. Daily doses higher than 20 mg should be avoided since this would increase the frequency and intensity of adverse reactions without significantly increasing efficacy. For patients needing long term treatment a reduction to a daily dose of 10 mg may be tried for maintenance. In principle, the dosage recommended also applies to elderly patients and those with kidney or liver disease. Because of lack of clinical experience, no dosage recommendations have so far being established for patients less than 18 years of age [27].

1.6.4 Contraindications and precautions: Tenoxicam should not be administered to patients known to be hypersensitive to the drug. Patients in whom Salicylates or other NSAIDs induce symptoms of asthma, rhinitis, or urticaria should be avoided. This is also applied to those who have suffered or are suffering from upper gastrointestinal disease including gastritis, gastric and

duodenal ulcer. Before anaesthesia or surgery, tenoxicam, like other NSAIDs, should not be given to elderly patients, to patients at risk or renal failure, or to patients with increased risk of bleeding, because of increased risk of acute renal failure and possibly of impaired homeostasis[28].

Concurrent administration of salicylates or other NSAIDs should be avoided because of the increased risk of gastrointestinal adverse reactions. As with other NSAIDs simultaneous anticoagulants and or antidiabetics should be avoided unless the patient is closely monitored. Prostaglandin synthetase inhibition may have an adverse effect on renal function. As with other NSAIDs, therefore, with tenoxicam, it is necessary to adequately monitor the renal function, when giving the drug to an elderly patient or to patient with conditions that increase their risk of developing renal failure such as preexisting renal disease, impaired renal function in diabetics, hepatic cirrhosis, congestive heart failure, volume depletion and concomitant treatment with diuretics or with known nephrotoxic potential [29].

1.6.5 Undesirable effects: During clinical trials lasting from one to five days, the parenteral form of tenoxicam is proved to be generally tolerated in the recommended dose of daily 20 mg. The local tolerance is good. In patients given Tilcotil parentally, undesirable clinical effects or deviations from normal

laboratory values are usually mild and transient. These effects subsequently disappeared, even when treatment is continued with oral form [30].

Tenoxicam is proved to be generally well tolerated in the recommended daily dose of 20 mg. The proportion of patients with undesirable clinical or laboratory effects is found to be around 12.5%. Only in about one percent of all patients do these effects necessitate interruption of treatment at 20 mg daily dose. In treatment lasting several weeks to three months, 11% are gastrointestinal tract effects in form of gastralgia, heartburn, nausea, diarrhea and constipation; rarely hemorrhage ulcers and perforation, three percent: central nervous system effects with dizziness and headache, one to two percent is skin manifestations in form of itching, rash, erythema and urticaria. These may be seen around the anal verge in rectal form of therapy [31].

With no exception to the non-steroidal anti-inflammatory group, very rarely, it can cause Steven-Johnson and Lyell syndromes. One to two percent is the renal effects of the drug and one to two percent is its biliary effects in form of raised hepatic enzymes and bilirubin. Rare miscellaneous effects include decreased hemoglobin, granulocytopenia, thrombocytopenia, photodermatosis and slight edema. Long term studies from 12 to 48 months have not revealed any increase in the side effects [28].

1.6.6 Interactions & clinical tolerability of perioperative tenoxicam: No interaction has been found with concomitantly administered antacids, probenecid, cimetidine, warfarine, and phenprocoumon at the recommended dosages. Salicylates displace tenoxicam from protein binding sites and thus increase the clearance and volume of distribution of Tenoxicam. Blood glucose should be monitored closely in patients on oral antidiabetics. On the other hand no interaction is recognized with antihypertensive. Tenoxicam is not advised in patients on diuretics, for the area is not yet studied [(31)].

The adverse events (AEs) associated with perioperative tenoxicam shows no increase in the overall incidence of side effects or in major side effects. Of major side effects possibly or probably related to tenoxicam all but one involved postoperative surgical site bleeding. However, in the subgroup of patients undergoing otorhinolaryngology surgery, surgical site bleeding can occur. Endosmotically proven duodenal ulceration with malaena again is encountered in some studies. In general, perioperative tenoxicam is well tolerated in comparison with placebo in most studies and the incidence of drug-related major AEs (other than post-operative bleeding) is no greater than 1 in 150 in low risk patients [(32)].

Dizziness, headache, tremor, somnolence, confusion, depression are recorded. Hallucinations, anxiety and delirium have all been attributed to NSAID, including tenoxicam [(27)], but evidence that such events were no more common

than in patients receiving placebo [31]. Therefore neurological and psychiatric phenomena are not side effects of perioperative tenoxicam in relatively short courses. The drug neither promotes nor reduces nausea or vomiting but dyspepsia is more common with tenoxicam [33].

The post-operative bleeding at the site of surgery in patients who received tenoxicam is significant in patients undergoing ORL procedures and an increased risk of re-operation with NSAID after tonsillectomy has been identified in two recent systematic reviews, so this finding warrants further investigation. However there are significantly lower pain scores at rest and on activity in tenoxicam patients and a non-significant trend towards less disturbance of sleep because of pain [29].

Studies of the analgesic efficacy of tenoxicam in laparoscopic, endoscopic and gynaecological surgery have reported potency but some adverse reactions. They are not placebo-controlled and involved only a single dose of tenoxicam and/or relatively small numbers of patients [34, 35, 36, and 37].

The only placebo-controlled study is applied for only 68 patients that exposed to tenoxicam following patients for eight days after knee surgery did not report AEs in detail [30].

1.6.6.1 Effect of intravenous tenoxicam during caesarean delivery on platelet activity: An addition of tenoxicam to the epidural block is a proved to

be potent analgesic [38]. The effect of intravenous tenoxicam during caesarean delivery on skin bleeding time, operative, and postoperative blood loss, and beta-thromboglobulin and platelet factor 4 as specific molecular markers for platelet activity 50% were given tenoxicam 20 mg intravenous 10 min before induction of general anaesthesia, and 50% formed a control group. Skin bleeding time and platelet markers were determined the day before and one hour after induction of anaesthesia. Results are in the tenoxicam group, there is good analgesia but a slight increase in skin bleeding time with no statistically significant changes in platelet marker levels. NSAIDs inhibit platelet aggregation and prolong bleeding time in healthy subjects, because of an inhibitory effect on cyclo-oxygenase, and a reduced platelet production of thromboxane A2 [39].

An increased in uterine bleeding tendency is found to be more frequent in patients given preoperative tenoxicam, but with no statistical significance. This did not prolong the duration of operation or cause postoperative complications. The magnitude of this effect is similar to that seen with aspirin [40].

Tenoxicam is 99% bound in human plasma with a low lipophilicity due to a highly ionized state, which could contribute to slow onset time for analgesic drug effect. NSAIDs only alter bleeding time during the activity of the drug. However, certain members of the population are more sensitive [41].

The effect of aspirin on hemostasis is more than others, so pregnant women could have a greater effect from tenoxicam, and this might increase bleeding time one hour after intravenous injection [42].

In late pregnancy, there is increased activation of the platelet, clotting, and fibrinolytic systems in vivo in addition to the observation of an increase in preoperative beta-thromboglobulin and platelet factor 4 levels [43].

The increase in platelet activation in late pregnancy appears to be physiologic rather than a reflection of an abnormal state or platelet activation in vitro [44].

Platelets may show a measurable decrease in aggregability after NSAIDs, which inhibit platelet cyclo-oxygenase and reduce platelet production of thromboxane [45].

It has been reported that a significant decrease in both plasma thromboxane and beta-thromboglobulin after treatment with 300 mg acetylsalicylic acid [46].

It has been demonstrated that surgery and/or intermittent positive pressure ventilation cause a significant rise in the level of plasma thromboxane 30 min after beginning of surgery and up to 24 hours after operation and the pre-operative infusion of a loading dose of diclofenac totally abolished this increase [47].

Tenoxicam before surgery antagonizes the increase in platelet marker levels. Tenoxicam may counteract the increased risk of thromboembolic complications

caused by mechanical ventilation, pelvic caesarean delivery, and the puerperium [48, 49].

Studies have found that preoperative administration of small doses of NSAIDs versus tenoxicam does not increase blood loss after gynaecological, spine and transurethral prostatectomy, while full doses have been shown to increase intraoperative blood loss [50, 51, and 52].

Therefore, it may be prudent to avoid the use of NSAIDs during operation in the presence of other defects of hamostasis or coagulation [53, 54].

Low back pain is a common postoperative complaint after any type of anaesthesia. The incidence of post epidural backache after obstetric delivery is between 30% and 45%, [54]. The incidence of immediate postoperative backache after non obstetric surgery is 2-31%. Postoperatively, patients frequently associated post epidural backache with epidural anaesthesia administered for the operation [55, 56].

It is recommended the use of field-block anaesthesia to prevent post epidural backache, but the technique is not simple and the result is unsatisfactory. Conversely, systemic nonsteroidal anti-inflammatory drugs have been used widely to treat low back pain. Minor analgesic effects of locally applied NSAIDs also have been reported in animal and clinical studies. [57].

Prophylactic local administration of a small dose of tenoxicam 2 mg reduced the incidence of post epidural backache after epidural anaesthesia for hemorrhoidectomy [58].

The recommended systemic dose of tenoxicam for postoperative pain is 20-40 mg intravenous or intramuscular every 24 hours. The local addition of small dose tenoxicam 2 mg is effective in reducing the incidence, duration, and severity of post epidural backache, particularly after multiple attempts at needle placement. Complications because of systemic tenoxicam administration are not found in this dosage [59].

1.7 Surgical Perianal Pathologies

1.7.1 Examination of the anal verge and Digital rectal examination: This requires careful attention to circumstances. The examining couch should be of sufficient height to allow easy inspection and access for any necessary man-ouvres. A good light is mandatory. The Sim's left lateral or the lithotomy position are satisfactory: The latter is less convenient for an elderly patient and can cause social embarrassment to young women. The patient should be consented, relaxed and able to co-operate.

With the buttocks opened, the anus is inspected for any lesions, e.g. inflammatory skin changes. Haemorrhoids, fissure, sentinel pile, fistula or

protruding anal tumour. The patient is asked to strain down before inspection is concluded. The examination is performed with the index finger. A lubricant is necessary. Any secretions should be sampled before applying lubricant to the anal verge. Extreme gentleness should be the rule so that pain is not caused. Painful spasm of the anal sphincters is confirmation of a hidden fissure if the history is suggestive

The examination should check normal, as well as abnormal, structures according to the plan, intraluminally one felt feces and polyps or carcinoma may be felt, intramurally, normal sphincteric muscles and anorectal angle plus feeling a lieomyoma or carcinoma and finally extramurally one should feel for perianal structures and abscesses.

At the same examination, the rectum is examined according to the same system. Before withdrawing the finger, the patient is asked again to strain down, and a note is made regarding the prostate in a male patient and the cervix, uterus and pouch of Douglas in a female. After withdrawal, the finger is examined for mucus, pus, blood and abnormal faecal material [60].

1.7.2 Proctosigmoidoscopy: This is the examination is the rectum, the anorectal junction and the anal canal. The patient should also be asked to strain during withdrawal as by so doing an internal intussusception may be made visible. Minor procedures can be carried out through this instrument, e.g. treatment of

haemorrhoids by injection or banding and biopsy.

Although Sigmoidoscopy is strictly an examination of the rectum and lower sigmoid colon, it should be carried out even when an anal lesion has been confirmed. Rectal pathology, e.g. colitis or carcinoma, is frequently the cause of an anal lesion, e.g. fissure or haemorrhoids. Not infrequently, rectal pathology is found that is independent of the anal lesion and which requires treatment [61].

1.7.3 Fistula in ano

1.7.3.1 Pathogenesis and Classification: A fistula-in-ano is a granulation tissue-lined track that connects the perianal skin and ano-rectum. It usually results from spontaneous or inadequate anorectal abscess drainage. The standard classification is into subcutaneous, sub mucous, low anal, high anal, and pelvirectal. Parks classification is based on the origin of fistula into intersphincteric, trans-sphincteric, high or low, and Supralevator.

The anal Fistulae are classified according to the site of the internal opening into Low and high, below and above the anorectal ring respectively. The low fistula can be laid open without damage to the anorectal bundle; high fistula needs staged operations and protective colostomy. The later is to prevent septic complications and shorten healing time between the stages. By standard classification high fistulae are both a high anal & pelvirectal fistula and by Parks' classification, high fistula is both high trans-sphincteric or supralevator

fistula. Intersphincteric is either high or low depending on what level it entered the anal canal. Goodsall's rule in assessment of fistulous tract anterior to transverse line, fistulas have straight short track, which passes direct to the bowel. Fistulas have single external opening. Those posterior to transverse line, the common fistulae have curved tracks, and may be of the horseshoe variety. Fistulas have multiple external openings connected to solitary internal orifice, usually at midline. The transverse line is drawn across the anus. Clinical features include pain at defecation, persistent seropurulent discharge that causes irritation of the surrounding skin. Ultrasonographic or magnetic imaging is advised for mapping complex fistulae. Probing: has a limited value because it is painful [(62).]

1.7.3.2 The management: This aims at opening the fistulous track from its termination to its source. A probe is inserted into the distal orifice, and passed until it reaches a point where no pass. The granulation tissue is wiped by curette and gentle probing. The edges of track are trimmed, 1-3mm of tissue are removed for histological examination. The internal sphincter can be cut if necessary for intersphincteric fistula track to be laid open. The low-level is treated by an exploration of the track with a great care as the probe can be pushed through the levator ani into rectum, thus converting a low fistula into a high fistula. The high-level may lead to incontinence, so a staged operation and a coveting colostomy would be the

proper treatment [63].

The supra-sphincteric fistula, occasionally inter-sphincteric, passes over the top of the sphincter before it passes down again in the ischiorectal fossa. An indwelling Seton is needed in such a case. Secondary extra-sphincteric or supralevator fistula is due to local disease such as Crohn's disease, ulcerative colitis, carcinoma, a foreign body and trauma. The management is that of the underlying cause. A traumatic fistula usually needs a colostomy. None of these fistulae requires to be laid open, which would in any case cause incontinence [62, 63].

1.7.4 Fissure in ano and benign strictures: An anal fissure is a linear tear in the lining of anal canal, anoderm, or it is an elongated ulcer in the long axis of the lower anal canal. The condition is more common in women.

The usual site for an anal fissure is the midline posteriorly, this constitutes 90%, next most frequent site is the midline anteriorly. This usually originates below the dentate line extending to the anal verge. Cause remains unknown but here some certain causes of anal fissure. Incorrectly performed hemorrhoid operation; if too much skin is removed anal stenosis is ensued and tearing of the scar in any hard movement that leads to anal fissure Inflammatory bowel disease particularly Crohn's disease; sexually transmitted diseases [60].

1.7.4.1 Pathogenesis and Pathology: Acute anal fissure is a deep tear through

the skin of anal margin extending into the anal canal. It is associated with spasm of anal sphincter. Chronic anal fissure is characterized by inflamed indurated margins, and a classic triad that is anal ulcer, hypertrophic papilla and sentinel pile. Hypertrophic papilla is located at the proximal margin. Sentinel pile is a fibrotic external hemorrhoidal tissue at the distal fissure margin. There may be spasm of internal sphincter involuntary part [62, 64].

1.7.4.2 Clinical features: Sharp burning pain starting during defecation, often lasting an hour or more because the fissure occurs in sensitive stratified epithelium of the lower half of anal canal, constipation because patient tends to avoid defecation and bleeding is usual. Discharge is slight and accompanied by pruritis. The diagnosis is based upon a typical history and on examination there is a sentinel skin tag can usually be displayed, with a tightly closed, puckered anus, is almost pathognomonic of the condition [64].

1.7.4.3 The management: Treatment aim is to obtain complete relaxation of internal sphincter, so the fissure will slowly heal as soon as spasm has disappeared. Conservative treatment in acute & superficial fissure, anal dilator may be passed after surface local anesthetic to relax anal sphincter twice / day for a month, for fissure to heal. Laxatives are prescribed to ensure that the motions are soft, Celevac tablets give a soft stool of good

bulk and increased fluid intake and suppositories are not effective.

The operative measures in chronic cases with fibrosis, skin tag, or mucous polyp, lateral anal sphincterotomy (75%), give local anaesthesia. Then internal sphincter is divided away from the fissure itself usually either in the right or left lateral positions. Healing is usually complete within three weeks. Dorsal fissurectomy and sphincterotomy is the division of the transverse fibres of internal sphincter in the fissure floor. Sentinel pile is excised if present. The after-treatment consists of attention to bowels, a daily Sitz bath, and the passage of an anal dilator until the wounds have healed, which usually takes more than three weeks [(62)].

The strictures may complicate fissures. The spasmodic stricture is exemplified by anal fissure or rarely, accompanies a secondary megacolon, possibly due to chronic use of laxatives. Other examples of organic strictures those follow either surgery or irradiation. A postoperative stricture sometimes follows hemorr-hoidectomy that being performed incorrectly. Low coloanal anastomoses, especially if a stapling gun is used, can narrow down postoperatively. Senile anal stenosis is a condition of chronic internal sphincter contraction is sometimes seen in elderly. A carcinoma should be suspected if a stricture is found, until a biopsy is obtained [(61, 64)].

1.7.5 Haemorrhoides

1.7.5.1 Pathogenesis and Clinical Features: Haemorrhoids are venous varicosities that may be external or internal to the anal verge. External haemorrhoids are covered by skin, while the internal variety lies beneath the anal mucous membrane. The internal haemorrhoids are dilatations of the internal venous plexus within an enlarged displaced anal cushion due to communication between the internal and external plexuses. If the former becomes engorged, the latter is liable to become involved, The two varieties may be associated as interoexternal haemorrhoids.

The internal haemorrhoids show a column of blood is unassisted by valves that produces high venous pressure in lower rectum, unparalleled in the body. They become engorged and the mucosal lining is gathered prominently in three anal cushions that can be in the areas of the three terminal branches of the superior haemorrhoidal artery. The anal cushions are present in embryonic life and are necessary for full continence. Straining causes these cushions to slide downwards and internal haemorrhoids develop in the prolapsing tissues.

Symptomatic haemorrhoids may appear in carcinoma of rectum. The Predisposing factors include Pregnancy [48], straining at micturition induced by over-purgation, chronic constipation and diarrhea of enteritis, colitis, or

dysenteries and hereditary such as a congenital weakness of the vein walls or an abnormally large arterial supply to the rectal plexus. They are frequently arranged in three groups at 3, 7, 11 o'clock according to arterial supply in lithotomy position. It has the three forms a pedicled one that is situated at anorectal ring and covered with pale pink mucosa, another which commences just below the anorectal ring and covered by bright red or purple mucosa and an external associated skin-covered haemorrhoid that lies between dentate line and anal margin. The degrees of haemorrhoids are either first, second or three or fourth. This is according to presence of bleeding, bleeding and prolapse on straining with spontaneous reduction, bleeding and prolapse on straining with manual reduction and permanent prolapse [(64)].

Clinically, bright red bleeding on defecation is the earliest symptom, a prolapse that leads to a great discomfort, heaviness and mucoid discharge. Other symptoms are pruritus, pain that accompanies complications as abscess or anal fissure. The diagnosis depends on inspection when the patient strains, internal haemorrhoids may come into view transiently or, if they are of the third degree, they are prolapsed. Digital examination is not helpful unless they are thrombosed.

The proctoscopy and sigmoidoscopy were done to exclude higher lesions.

The rectal prolapse, pruritis, anorectal carcinoma, or inflammatory bowel disease should be excluded before a confident diagnosis is made. Hypertrophied anal papilla may be seen at the dentate line. They are the remnants of ectodermal membrane that present normally in 60% of examined patients as elongated anal papilla. they should not be confused with haemorrhoids. Elongated papillae should be excised under local anesthetic on the same occasion.

1.7.5.2 Management of a patient with hemorrhoids: An advice is always necessary in form of bowel habit education, high-fiber diet, adequate liquid intake and psyllium seed product for stool softening. Patients must avoid straining and decrease excessive time spent on toilet. Conservativation aims to regulate bowel habits and ease defecation by astringent ointments and anesthetic creams. The injection sclerotherapy of phenol in almond 5% or sodium morrhuate leads to submucosal fibrosis at pile base and venous obliteration. Rubber-Band ligation with a Barron's apparatus is used to place rubber elastic bands on the base leads to ischemic necrosis and sloughing of piles within few days [(65)].

Cryosurgery by liquid nitrogen that expresses the extreme cold at -196˚C ends in coagulative necrosis of piles. Infra red Photocoagulation and the above-mentioned modes of treatment are for first and second degree

haemorrhoides. They are effective and painless. The indications for haemorrhoidectomy are thus failure of non-operative treatments of second degree haemorrhoides, fibrosis, interoexternal, third & fourth degrees. Preoperative preparation should be held in form of aperients, regionional shaving and enema. The open or closed technique involves ligation and excision of hemorrhoid. The anal mucosa and skin are left open to heal by secondary intention in the open technique while the wound is sutured in the closed technique. The postoperative complications include pain, retention of urine and hemorrhage [64].

The complications of haemorrhoides are profuse hemorrhage, strangulation, thrombosis, ulceration, gangrene that occurs with tight, fibrosis following thrombosis, and suppuration and portal pyemia is uncommon. The strangulating piles are reduced digitally after dilating the anal sphincter under anaesthesia. The thrombosed and gangrenous are surgically excised. A severe hemorrhage due to the use of anticoagulants is by local adrenaline compression, morphine and blood transfusion. The external haemorrhoides or a perianal haematoma is called ‘a 5-day, painful, self-curing lesion’, is a small dot occurs in the perianal subcutaneous connective tissue, usually superficial to the corrugator cutis ani muscle. The haematoma is usually situated in a lateral region of the anal margin. It is due

to straining at stool, coughing, or lifting a heavy weight that increases back pressure on anal venule leading to rupture of a venule and perianal haematoma. It is tender, painful, suddenly appeared and on tense on examination. It is excised under local anaesthesia. The relief of pain is immediate and a permanent cure is certain, being left untreated, it resolves, fibrosed, and gives rise to a cutaneous tag [61, 64].

1.7.6 Ano-rectal Abscesses: They are a common cause of admission to hospital, being more common in males and in the third decade of life. There is no apparent cause, but it has been suggested that infection arises in the anal gland. The pus tracks downwards to present as perianal abscess, outwards to form an ischiorectal fossa abscess and upwards to produce a high intermuscular abscess. An underlying cause should be sought in any recurrent abscess.

1.7.6.1 Clinical presentation: An acute painful tender swelling with minimal systemic upset is the presentation of perianal abscess. ischiorectal fossa abscess is painful tender swelling lateral or posterior to the anus on digital rectal examination with pronounced systemic signs. The uncommon intersphincteric abscess presents as continuous throbbing pain that exacerbated by daefecation. Anal discharge of pus or blood may be a complaint. Rectal examination may show boggy submucous tender swelling [64].

1.7.6.2 Management: The abscess should be drained under general anaesthesia through cruciate incision. Bacteriological examination and probing to exclude fistula are mandatory measures. If there is no fistula, the four triangles of the cruciate skin incision should be excised to deroof the cavity.

1.7.7 Lower Rectal and Anal Neoplasms

1.7.7.1 Benign Tumours: Polyps are elevations of the mucosal surface in the rectosigmoid and decending colon in 65% of cases. They are either sessile with broad base or pedunculated with a holding stalk. Their incidence is 25% for patients older than 60 years. Hyperplastic, hamartomatous and inflammatory polyps have no malignant potential while the adenomatous polyps have. They present with rectal bleeding or positive faecal occult blood and confirmed by sigmoidoscopic or colonoscopic examination [(66)].

Anal papillomata either warts or condylomata acuminata are multiple sessile or pedunculated friable lesions due to viral infection or immunosuppression in the perianal area. Their presentation is irritating bloody discharge. Local application of podophyllin, excision or diathermy and interferon are the known modalities of treatment.

1.7.7.2 Malignant Tumours: Although carcinoma of the rectum is 50 times more common, this accounts for about 50 percent of malignant anal growth.

Localized ulcer, profuse discharge, incontinence anal stenosis or indurations, inguinal lymphadenopathy are the possible presentations.

Biopsy as minor procedure should be obtained to confirm the diagnosis of colorectal cancer on screening surveillance and suspected cases. If excision is feasible, abdomioperineal resection is done. Radical radiotherapy is an adjuvant, palliative or alternative [67].

CHAPTER TWO

OBJECTIVES & METHODOLOGY

2.1 The objectives

a) To determine efficacy of preoperative intravenous tenoxicam in postoperative pain relief in patients having minor ano-rectal operative procedure.

b) To determine the tolerability and safety of the drug in these patients.

2.2 Patients and Methods

This is a prospective, multicentric, open study which was conducted in the period between august 2005 and October 2006. The study included 163 Sudanese patients with ano-rectal conditions who underwent examination just before anaesthesia and / or surgical intervention as elective or emergency at Soba University and Khartoum Teaching Hospitals.

The exclusion criteria of this study included American Society of Anesthiologists (ASA) Grade 4 and 5, patients less than 16 years old, patients with asthma, bleeding tendency, symptoms of bladder outlet obstruction, peptic ulcer disease, chronic renal problems, blindness or motor or sensory neurological deficit and pregnant ladies.

Informed consent was obtained from each patient after a preoperative discussion and explanation of the study. This is mandatory for patient co-operation and relaxation [13].

The patient's personal information was collected in a pre-designed questionnaire. It included name, age, gender, residence, occupation, socioeconomic status, marital status and educational level. There was especial emphasis on history of previous ano-rectal or other surgeries, the diagnosis, the clinical type of surgery and anaesthesia, surgeon grade and the operative time. (Plate No.1)

The pulse, blood pressure and respiratory rate were measured and recorded on

the day before surgery and postoperatively at the recovery room (zero time), 4, 8 and 24 hours.

Temperature below 38^{o}C was considered as normal, between 38^{o}C and 39^{o}C as moderately elevated and above 39^{o}C as high. Pulse of 80/min or less was considered as normal, between 80/min and 90/min as moderately rapid and above 90/min as markedly rapid. The respiratory rate up to 16/min was considered as normal, between 16 and 18/min as moderately increased and above 18 as markedly increased. Systolic pressure of 130 mmHg or less was considered as normal, between 130 and 145 mmHg as moderately raised and above 145 mmHg as high [6, 9].

The patients were randomized by an anaesthetic assistant into two groups, the placebo group that received intravenous 50 mg hydrocortisone in 4 ml normal saline and trial group that received intravenous 40 mg tilcotil in 4 ml volume. This subphysiological dose was used because it has the same optic density to the tested drug. This was measured using spectrophotometer. Patients of the trial group were labelled as T group, and those who were given the placebo as P group. Two mg of tenoxicam were given intra-dermally to test for drug hypersensitivity before giving the drug intravenously. No patient had local anesthetic in this study as this blocks the peripheral sensation and later it magnifies postoperative pain, especially in the second postoperative day [16].

Every patient was advised to take oral paracetamol up to one gram every eight hours and if needed pethidine sulphate was given in an appropriate dose [17].

In this study, the postoperative pain was assessed using visual analogue scale, verbal comment, laddered colour category and face description in the recovery room (zero time), at 4, 8 and 24 hours postoperatively.

The visual analogue scale is a printed horizontal line 100 mm long. It was used without gradation to avoid reducing its sensitivity. The measurements of visual analogue scale were done by a single transparent ruler used for manual scoring all the time. Scores of 70 mm or more were considered as severe pain and those from 31 mm to 69 mm as moderate pain (Plate No.2). Patients were asked by the limited number of staff to mark their pain on the VAS line. This was to reduce the interpersonal effect between the interviewer and patient, particularly if there is a change of staff and one rating was not allowed to be a reference point for the next rating to eliminate response bias [68].

Patients were asked to describe their pain. This was taken as verbal comment and filled in a space provided in a pre-designed table in the questionnaire paper as no pain, mild, quite bad or moderate, very bad or severe.(Plate No.1)

Patients were offered a coloured ladder to tick on the pain level they had, Green, yellow, orange or red. (Plate No.2) [69].

The degree of postoperative mobility was assessed and classified as follows; few problems while doing most things considered as class A, many difficulties while stopping some activities considered as class B, disability with stopping normal activities considered as class C and no control on their activities considered as class D [1,11]. (Plate No.2 & Table No.11)

A face presentation compared according to the pre-designed figures, ranging from A which was normal face, B, C to D which was apprehensive very ill face [68]. (Plate No.3)

Pain management was not delayed or withheld by participation in this study. Interviews and data collection were performed by the researcher or staff member who were not aware of the clinical management of the patients [69].

Postoperative nausea and sedation were reported at 24 hours postoperatively. The degree of postoperative site bleeding was classified as minimal that wetted underwear, moderate that is associated with systemic symptoms (cold extremities, sweating &/or dizziness) and required a change of dressing and severe that required the administration of intravenous fluid or blood.

Postoperative satisfaction and pleasure were assessed at 24 hours postoperatively after giving him five options to choose to minimize the risk of inability to express. These were very unsatisfactory (The very worst quality), unsatisfactory

(Poor or not good enough), satisfactory (Expectations were acceptable), pleased (Willing and glad) and very pleased (The very best quality). (Table No.10) [13].

The statistical package of social sciences (SPSS) program, version 13, by (NDF Company) was used to analyze the obtained data. The Pearson Chi-Square test was used when appropriate. P values of less than 0.05 were considered as statistically significant.

CHAPTER THREE

3 Results

The study included 163 adult Sudanese patients with ano-rectal conditions. It was conducted in the period between August 2005 to November 2006 at Soba University and Khartoum Teaching Hospitals. The study group included emergency and elective cases. Eighty-seven patients (54%) were admitted from the outpatient clinics and 76 patients (46%) from accident and emergency department (Fig.1, Table 3). There were 111 male patients (68%) and 52 patients were females(32%) (Fig.2). Their ages ranged from 14 to 65 years with the mean age of (29 $\pm$ 6). Ninety-nine patients (60%) were single and 64 of them were married. The study group included 87 patients (53%) in the trial group and 76 patients (47%) in the placebo group.

There were 52 patients (31.9%) from Khartoum State, 46 patients (28.2%) from Gezira State, 21 patients (12.9%) from the Western Sudan and the remaining 44 patients (27%) was from Northern & Eastern Sudan. They were from different tribal origins. Most of the patients were labourers. (Fig.3).

With regards to their educational level, 55% of them had the intermediate education or less (Table.1). The majority of patients (85%) were either of low or moderate socioeconomic classes (Fig.4).

Ninety-one patients (56%) had no history of previous surgery, 64 patients (39%) had one operation before and only eight patients (5%) had more than one operation (Fig.5).

All patients were seen, examined and diagnosed by a consultant or a surgical registrar before surgery. Fifty-nine patients (36%) had fissure in ano either acute or chronic. Twenty-eight patients (17 %) had fistula in ano and that included recurrent disease, multiple fistulae and pus collection in a fistulous tract. Twenty-five patients (15.5%) had haemorrhoides in the form of external, third degree, recurrent, thrombosed or prolapsed haemorrhoides. Seventeen patients (10%) had perianal or submucous abscesses. In the study 68 patients (17%) had rectal bleeding due to prolapse, polyps and low rectal or anal tumors (Table 2).

Pain assessment using visual analogue scale at zero time was below 70 mm in 84 patients (96.5 %) in the trial group compared with 71 patients (93.4%) in the placebo group. This was not statistically significant, P value = 0.202 (Table 4). The postoperative pain measurements at eight hours were below 70 mm in 85 patients (97.7%) in the trial group compared with 68 patients (89.5%) in the placebo group. This was statistically significant, P value = 0.0001 (Table 5). The pain measurements at 24 hours postoperatively were below 30 mm in 81 patients (93.1%) in the trial group compared with 50 patients (65.8%) in the placebo group. This was statistically significant, P value = 0.0001 (Table 6).

Subjective measures of postoperative pain assessment at 24 hours were used and that included colour category. Green colour was chosen by 81 patients (93.1%) in the trial group compared with 31 patients (40.8%) in the placebo group. This was considered statistically significant, P value = 0.0001 (Table 7).

Fifty-one patients (57.5%) in the trial group 24 hours following surgery had normally looking face compared with 25 patients (32.9%) in the placebo group. This was statistically significant, P value = 0.0001 (Table 8).

Minimal pain was used to describe the pain by 64 patients (73.5%) in the trial group compared with 29 patients (38.2%) in the placebo group. This was statistically significant, P value = 0.0001 (Table 9).

Forty-six patients (52.9%) in the trial group had the best satisfaction 24 hours postoperatively compared with only five patients (6.6%) in the placebo group. This was statistically significant, P value = 0.0001 (Table 10).

Regarding postoperative motility, the study showed mobility of A and B degrees was more in the trial (74.7% of patients) compared with the placebo group (57.9% of patients), but this difference was not statistically significant, P value = 0.668. (Table 11).

The drug was tolerated by the patients since nobody developed a major adverse effect. There was significant difference between the two groups of patients with regards to nausea and the degree of post operative bleeding. (P value = 0.013, statistically significant) (Table12&13).

Postoperative nausea was reported in 37 patients (42.5%) in the trial group compared with 64 patients (84.2%) in the placebo. That is statistically significant, P values = 0.0001.

There was increase of analgesic doses of pethidine sulphate and sedation in the placebo group compared to the trial group and that was statistically significant, P values = 0.0001 (Table14 & 15).

CHAPTER FOUR

4.1 Discussion

The present study tested the use of intravenous tenoxicam for postoperative pain relief in 163 Sudanese patients with minor colorectal conditions. It proved to be efficient in relief of postoperative pain using VAS measurements, color category, face presentation, postoperative mobility and satisfaction. This is in line with what was reported by Limb who found that intravenous tenoxicam was as efficient as local anaesthetic infiltration in the early posthaemorrhoidectomy pain [(24)].

This is also in line with other authors who tested the analgesic efficacy of tenoxicam following different operations. The examples include Wilkinson who tested the intrathecal admininstration of 2 mg with spinal anaesthesia or intravenous 40 mg of tenoxicam to abolish postoperative backache following hemorrhoidectomy or epidural block [(57)], Flhakim who studied the effects of intravenous tenoxicam following caesarean section[(37)] and Eggers who studied the analgesic effect of intravenous tenoxicam in patients with knee replacement[(5)]

The postoperative mobility of patients in the trial group was earlier than those in the placebo group. This was statistically insignificant. This was commonly seen

in patients with previous surgery. Therefore this may be these patients had passed this experience before and able to overcome the fear of surgery. This in line with that reported by Gabrielli[20]. In this study patients with fissure in ano and no history of previous operation had delayed postoperative mobility. High pain scores were seen in patients with high socio-economic status and anorectal abscesses (Fig.5&9). This is more in line with what was reported with Deckler [29]. Postoperative mobility is a subjective measure and could be due to inadequate patients' counseling, type of surgical procedure and type of anaesthesia.

Rang [27] reported increased incidence of more nausea in patients in the trial group than in the placebo group. The present study shows higher incidence of nausea in the placebo group compared with the trial group. Patients in the placebo group received more pethidine sulphate which and the nausea may be attributed to it, because it is dose-related. Twelve patients (13.7%) in the trial group were given pethidine sulphate 25 mg and all of them had nausea.

Alan[33] reported no nausea but more dyspepsia with the drug. No patient in the study group had dyspeptic symptoms. The mean age of patients in this study is 29 years and that of his is 44 years, so the difference is probably age-related.

Tenoxicam has major adverse side effects such as gastric bleeding, renal impairment, or increased bleeding, caused by inhibition of platelet activity. However none of these side effects were observed in this study.

No patient experienced a gastrointestinal bleeding, neurological manifestation or hypersensitivity. This is in line with what was reported by Eggers who did only placebo-controlled study to test postoperative adverse effects of tenoxicam and not in line with Alan who reported one patient of 1001 patients presenting with gastric ulceration with malaena. . This was confirmed by endoscopic examination Alan's study is not randomized and Eggers' study group and ours are small to test for the major side effects of the drug [30].

Jones [37] reported a case of renal impairment following preoperative tenoxicam in a patient who underwent total abdominal hysterectomy and heintz [28] reported renal impairment, for this reason we had excluded patients with renal problems.

Although Flhakim [39], Cohen [48] and Marret [32] reported an increased incidence of bleeding with the usage of intravenous tenoxicam in caesarean section and tonsillectomy, the present study demonstrates that tenoxicam had no effect on postoperative bleeding following minor ano-rectal surgeries compared with the placebo group.

The increase of bleeding time reported by them one hour after intravenous tenoxicam was statistically significant but probably not of clinical significance, since the bleeding time was on the upper limit of 10 min in all patients.

In caesarean section, the potentiation of the side effects of the drug with pregnancy is considered and for this reason we excluded pregnant ladies.

The number of patients undergoing tonsillectomy in Marret's text is too small for analysis of site bleeding. The position in respect of major side effects, which are rare, is less reassuring. Some 60,000 patients per group would be required to show a statistically significant difference for the incidence of renal failure or major gastric bleeding between patients receiving NSAID and placebo. This finding is testimony to the importance of large, placebo-controlled, double-blind studies in defining the side effects of any drug.

Hallucinations, anxiety and delirium were not encountered in the study. This in contrast to what is reported by Heintz [28] who attributed these to NSAIDs including tenoxicam but in line with what is reported by Caughey [31] who declared that neurological and psychiatric phenomena are not side effects of perioperative tenoxicam in relatively short courses.

4.2 Conclusion

1. This is a controlled open study proved that preoperative intravenous 40 mg tenoxicam is efficient in acute pain relief following ano-rectal surgeries. The postoperative pain was measured by visual analogue scale, verbal comment, and laddered colour category, face description, postoperative pleasure and mobility.
2. The effective measure to postoperative ano-rectal pain is the serial assessment of its severity. Intravenous tenoxicam is efficient in alleviating this pain and minimizing the requirement of opioids.
3. It was tolerated by the patients and showed no significant adverse effects of other non-steroidal anti-inflammatory drugs.
4. The VAS is a universal tool for measurement of pain and can be used even in un-educated patients as shown in this study

4.3 Recommendations

1. Close regular postoperative pain assessment following ano-rectal surgery using any measure tool. The study proved this was of a reliable verbal estimation and can be used.
2. The usage of preoperative tenoxicam is recommended in a dose of 40 mg for adult patients with ano-rectal conditions.
3. It is recommended to avoid the drug in patients with gastrointestinal bleeding and renal problems whom were excluded from the study.
4. It is pertinent to suggest the use of VAS in ITU and when the postoperative pain is expected. It is a simple, sensitive, accurate and objective mode of assessment. The degree of activity and verbal comments are not always reliable.
5. Future studies are also recommended for preoperative intravenous and intra-operative topical tenoxicam for patients with minor surgical procedures and day case surgery.

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Figure (1): Distribution of patients in the study group according to admission route (n=163)

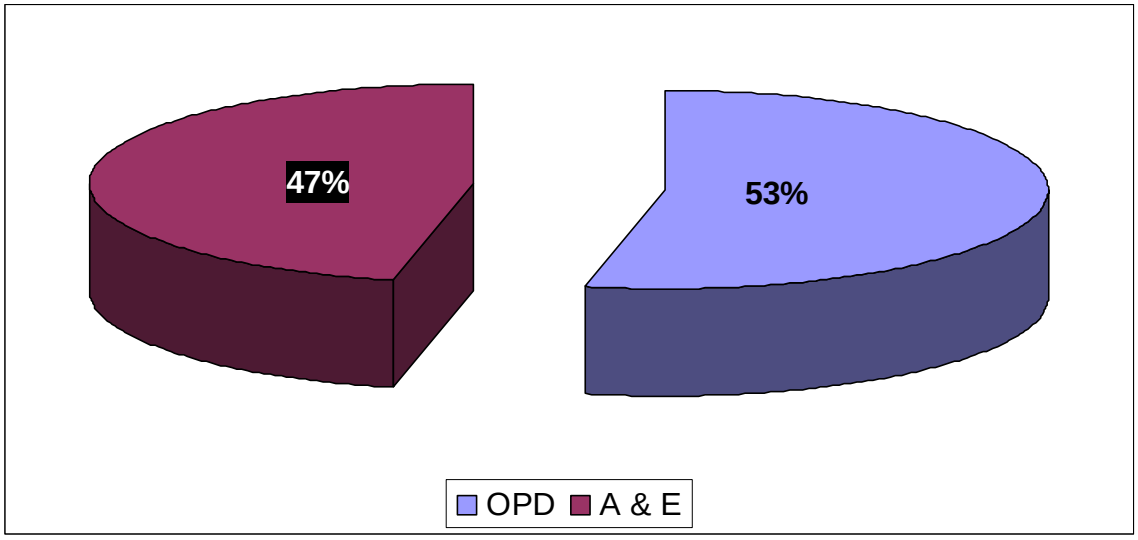

Figure (2): The gender distribution of the study group (n=163)

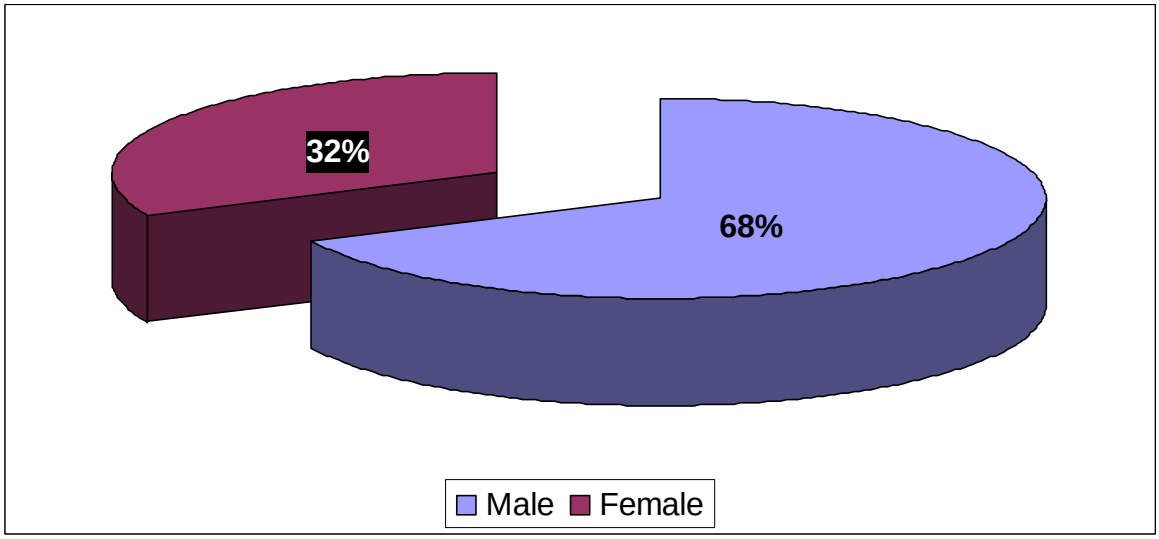

Figure (3): Distribution of patients in the study group according to occupation

(n=163)

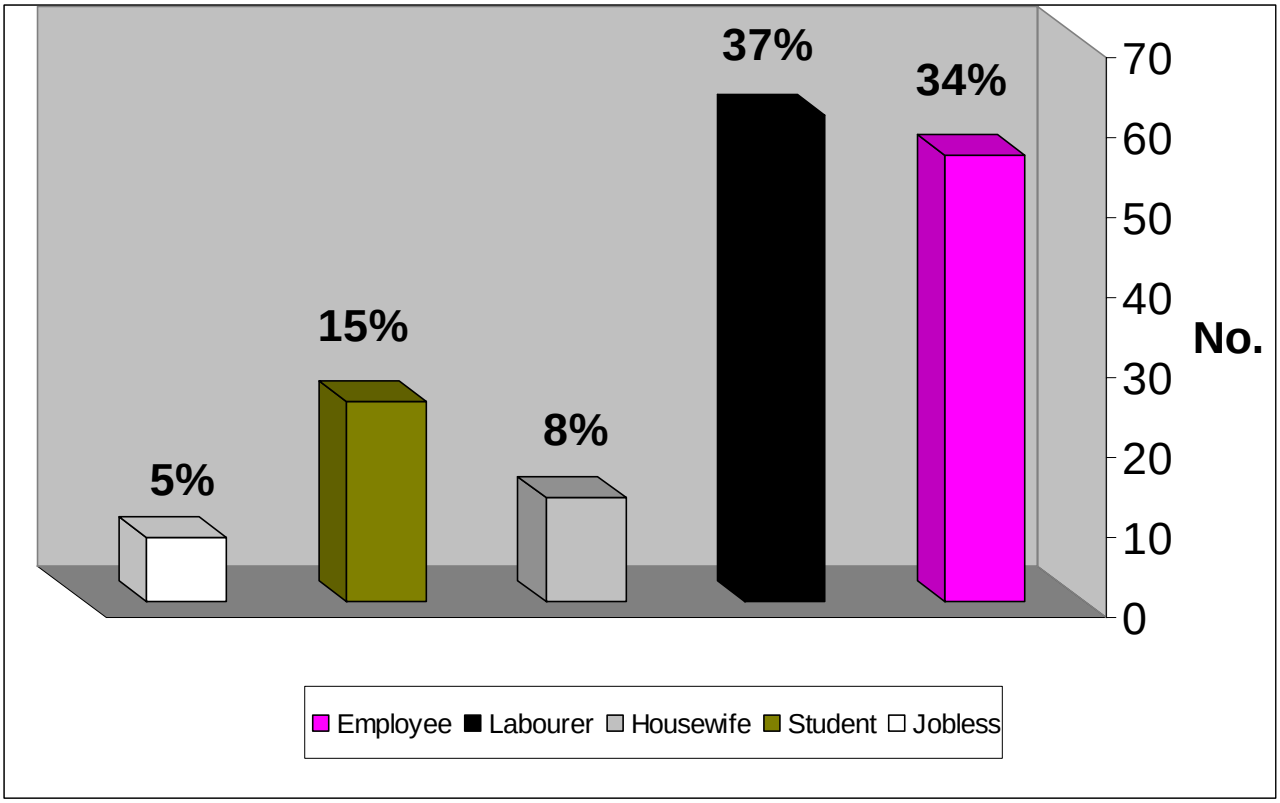
37%
34%
15%
8%
5%
70
60
50
40
30
20
10
0
No.
Employee
Labourer
Housewife
Student
Jobless

Figure (4): Distribution of the study group according to socio-economic status (n=163)

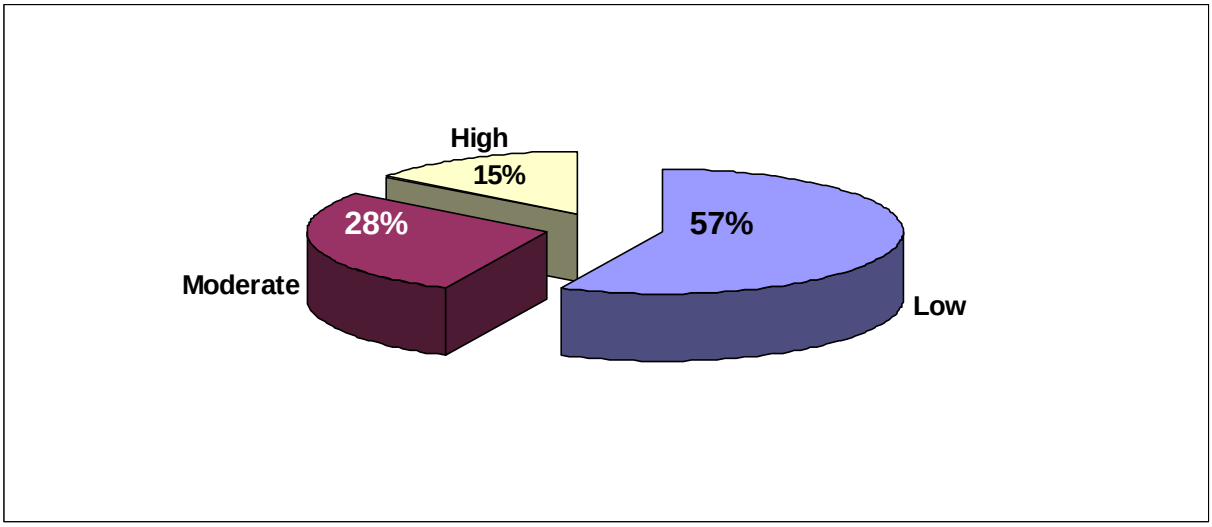

Figure (5): Postoperative pain assessment at 24 hours according to socio-economic status (n=163)

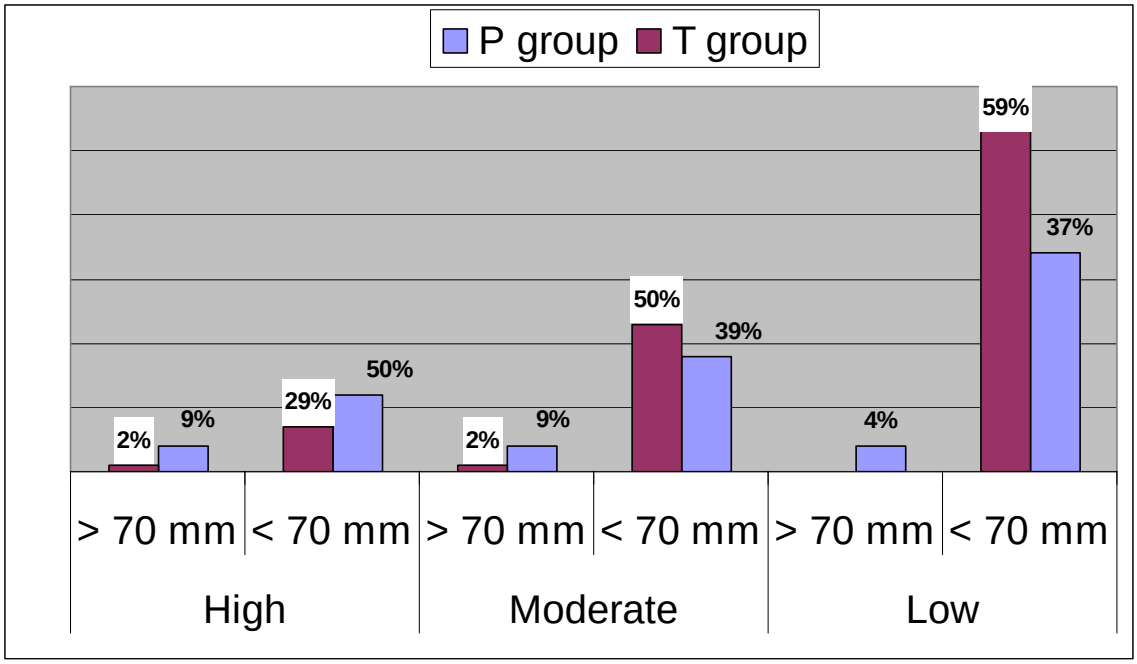

Figure (6): Distribution of patients the study group according to previous surgical intervention

(n=163)

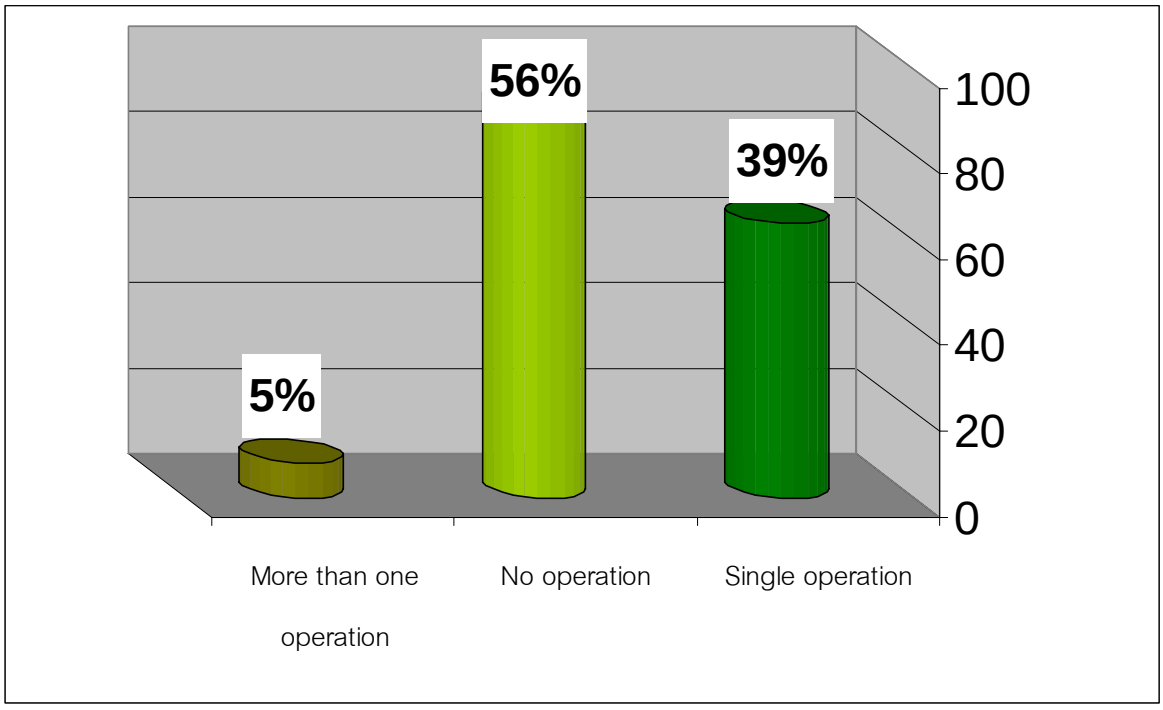

Figure (7): Postoperative pain assessment at 24 hours according to previous surgical intervention (n=163)

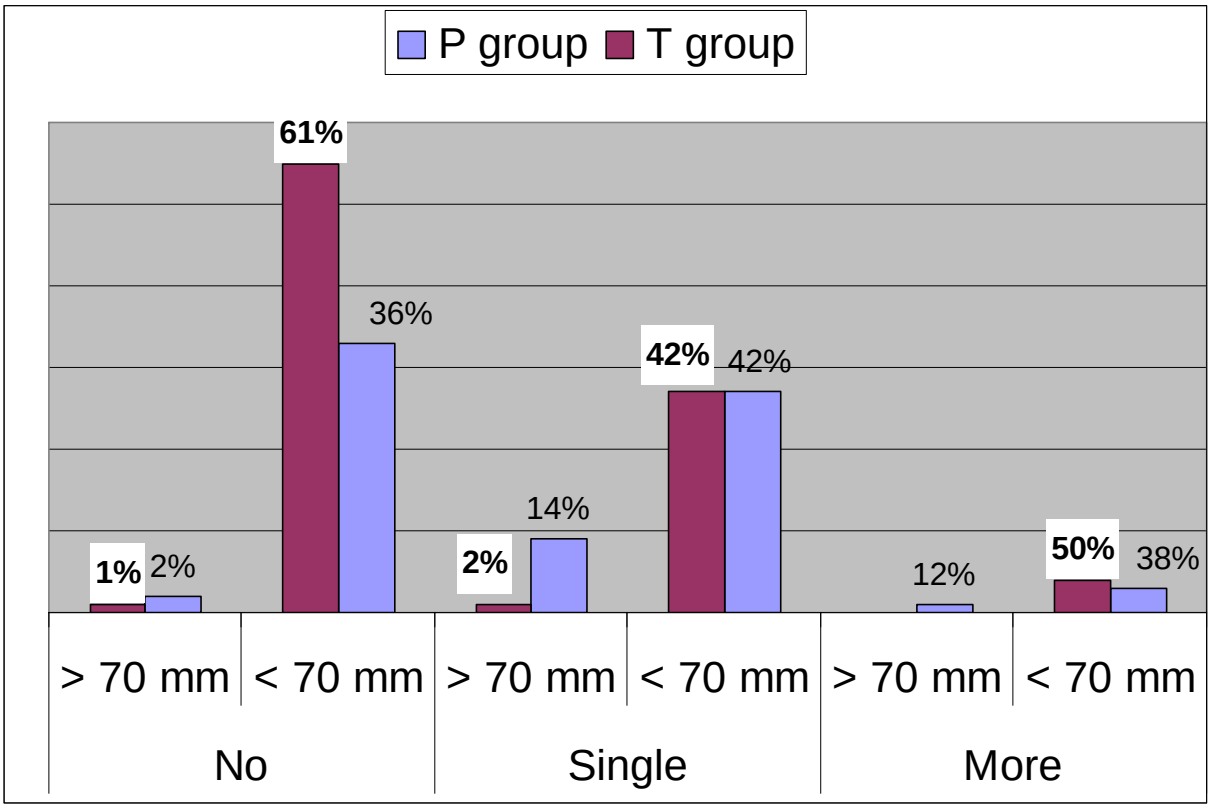

Figure (8): Postoperative pain assessment at 24 hours according to educational levels of patients in the study group

(n=163)

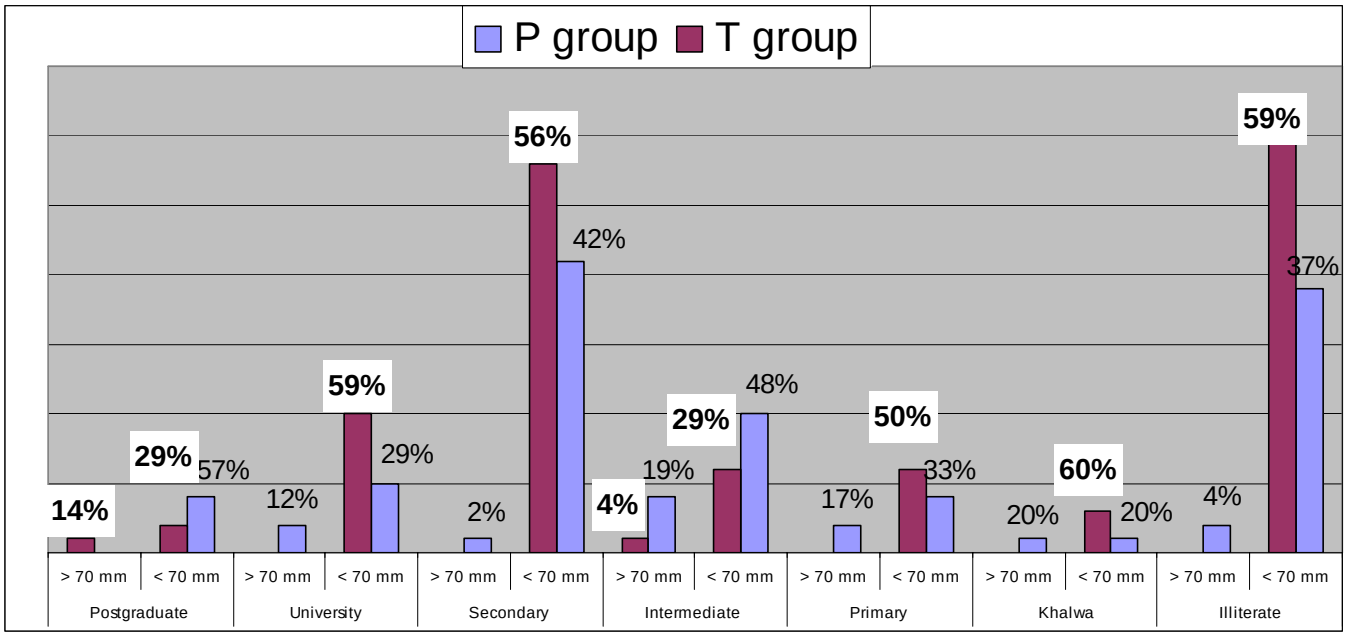

Figure (9): Postoperative pain assessment at 24 hours according to the type of ano-rectal conditions. (n=163)

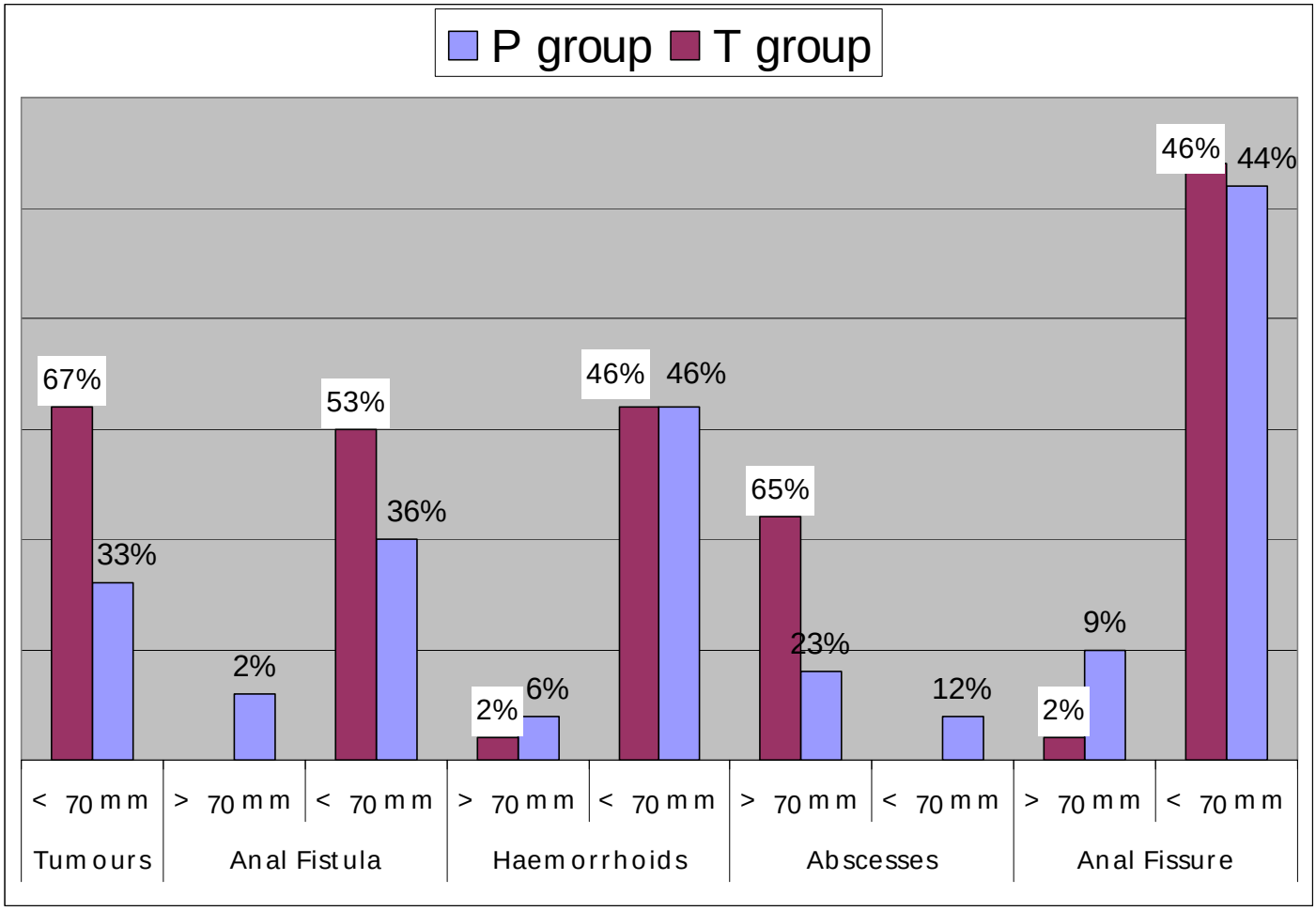

Table (1): The educational levels of patients in the study group (n=163)

Educational Level	No.	%
Illiterate	51	31.3
Khalwa	5	3.1
Primary	12	7.4
Intermediate	21	12.9
Secondary	50	30.7
University	17	10.4
Postgraduate	7	4.3
Total	163	100

Table (2): The types of ano-rectal conditions encountered in patients in the study group (n=163)

Diagnosis	No.	%
Fistula In Ano	28	17.2%
Haemorrhoids	35	20.9%
Fissure In Ano	59	63.2%
Perianal/submucous Abscesses	17	10.4%
Ano-rectal Tumours	24	15.3%
Total	163	100%

Table (3): Distribution of the study group according to the admission route (n=163)

			Admission Route		
			OPD	A&E	Total
Group	T GROUP	No.	53	34	87
		%	60.9%	39.1%	100.0%
	P GROUP	No.	37	39	76
		%	48.7%	51.3%	100.0%
Total		No.	87	72	163
		%	53.4%	44.2%	100.0%

P value = 0.662, statistically insignificant)

Table (4): Comparison of pain scores, using VAS measures, at zero time between T and P groups (n=163)

			VAS Measurements at Zero Time				Total
			0 - 3	3.1 - 5	5.1 - 7	7.1 - 10	
Group	T Group	No.	65	19		3	87
		%	74.7%	21.8%		3.4%	100.0%
	P Group	No.	46	24	1	5	76
		%	60.5%	31.6%	1.3%	6.6%	100.0%
	Total	No.	111	43	1	8	163
		%	68.1%	26.4%	.6%	4.9%	100.0%

(P value = 0.202, statistically insignificant)

Table (5): Comparison of pain scores, using VAS measures at eight hours postoperatively between T and P groups

(n=163)

			VAS Measurement (in cm) at Eight Hours postoperatively				
			0 - 3	3.1 - 5	5.1 - 7	7.1 - 10	Total
Group	T Group	No.	83	2	.00	**2***	87
		%	95.4%	2.3%	.00	2.3%	100.0%
	P Group	No.	52	12	4	**8***	76
		%	68.4%	15.8%	5.3%	10.5%	100.0%
Total		No.	135	14	4	10	163
		%	82.8%	8.6%	2.5%	6.1%	100.0%

(P value = 0.0001, statistically significant)

Table (6): Comparison of pain scores, using VAS measures at 24 hours postoperatively between T and P groups (n=163)

			VAS Measurements (in cm) AT 24 Hours Postoperatively				
			0 - 3	3.1 - 5	5.1 - 7	7.1 - 10	Total
GROUP	T GROUP	No.	81*	1	5		87
		%	93.1%	1.1%	5.7%		100.0%
	P GROUP	No.	50*	10	12	4	76
		%	65.8%	13.2%	15.8%	5.3%	100.0%
Total		No.	131	11	17	4	163
		%	80.4%	6.7%	10.4%	2.5%	100.0%

(P value = 0.0001, statistically significant)

Table (7): Comparison of pain assessment, using colour category, at 24 hours postoperatively between T and P groups (n=163)

			Colour Category at 24 Hours Postoperatively				
			Green	Yellow	Orange	Red	Total
Group	T Group	No.	81*	4	1	1*	87
		%	93.1%	4.6%	1.1%	1.1%	100.0%
	P Group	No.	31*	23	6	16*	76
		%	40.8%	30.3%	7.9%	21.1%	100.0%
Total		No.	112	27	7	17	163
		%	68.7%	16.6%	4.3%	10.4%	100.0%

(P value = 0.0001, statistically significant)

Table (8): Comparison of face description at 24 hours postoperatively between T and P groups (n=163)

			Face Description at 24 Hours Postoperatively				Total
			A	B	C	D	
Group	T Group	No.	50	14		23	87
		%	57.5%	16.1%		26.4%	100.0%
	P Group	No.	25	32	14	5	76
		%	32.9%	42.1%	18.4%	6.6%	100.0%
Total		No.	75	46	14	28	163
		%	46.0%	28.2%	8.6%	17.2%	100.0%

(P value = 0.0001, statistically significant)

KEY

- **A = Normal face**
- **B = Alert face**
- **C = Frowning face**
- **D = Apprehensive face**

Table (9): Comparison of verbal pain assessment at 24 hours postoperatively between T and P groups (n=163)

			Verbal Comment at 24 Hours Postoperatively			
			Mild	Moderate	Severe	Total
Group	T Group	No.	**64**	18	**5**	87
		%	73.5%	20.7%	5.7%	100.0%
	P Group	No.	**29**	27	**20**	76
		%	38.2%	35.5%	26.3%	100.0%
Total		No.	93	45	25	163
		%	49.7%	27.6%	15.3%	100.0%

(P value = 0.0001, statistically significant)

KEY

- **Mild = discomfort on the site of the operation**
- **Moderate = quite bad**
- **Severe = very bad**

Table (10): Comparison of pleasure at 24 hours postoperative between T and P groups (n=163)

			Postoperative Satisfaction about Analgesia at 24 h					
			v. unsat	unsat	sat	plz	v. plz	Total
Group	T Group	No.		**1***	8	32	**46***	87
		%		1.1%	9.2%	36.8%	52.9%	100.0%
	P Group	No.	9	**17***	24	21	**5***	76
		%	11.8%	22.4%	31.6%	27.6%	6.6%	100.0%
Total		Number	9	18	32	53	51	163
		Percentage	5.5%	11.0%	19.6%	32.5%	31.3%	100.0%

(P value = 0.0001, statistically significant)

KEY

- **v.unsat: Very unsatisfactory = The very worst quality**
- **unsat :Unsatisfactory= Poor or not good enough**
- **sat :Satisfactory = Expectations were acceptable**
- **plz :Pleased = Willing and glad**
- **v.plz :Very pleased = The very best quality**

Table (11): Comparison of mobility at 24 hours postoperatively between T and P groups (n=163)

			Postoperative Mobility at 24 h				
			A	B	C	D	Total
Group	T Group	No.	62	3	5	17	87
		%	71.3%	3.4%	5.7%	19.5%	100.0%
	P Group	No.	40	4	10	22	76
		%	52.6%	5.3%	13.2%	28.9%	100.0%
Total		No.	102	7	15	39	163
		%	62.6%	4.3%	9.2%	23.9%	100.0%

(P value = 0.668, statistically insignificant)

KEY

- **A = performing most of activities**
- **B = Stopping some activities**
- **C = disability with stopping normal activities**
- **D = no control considered as class D**

Table (12): Comparison between trial and placebo groups according to postoperative bleeding at 24 hours (n=163)

			Postoperative bleeding at 24 h			
			Minimal	**Moderate**	**Severe**	Total
Group	T Group	No.	**58***	13	16	87
		%	66.6%	14.9%	18.4%	100.0%
	P Group	No.	**25***	26	25	76
		%	32.9%	34.2%	32.9%	100.0%
Total		No.	83	39	41	163
		%	50.9%	23.9%	25.2%	100.0%

(P value = 0.0001, statistically significant)

KEY

- **minimal = wetted the dressing**
- **moderate = associated with systemic symptoms & required a change of dressing**
- **severe = required the administration of intravenous fluids or blood.**

Table (13): Comparison between trial and placebo groups according to presence of postoperative nausea at 24 hours (n=163)

			Postoperative Bleeding at 24 h		
			Not Present	Present	Total
Group	T Group	No.	**50***	**37***	87
		%	57.5%	42.5%	100.0%
	P Group	No.	**12***	**64***	76
		%	15.8%	84.2%	100.0%
Total		No.	62	101	163
		%	38.0%	62.0%	100.0%

(P value = 0.0001, statistically significant)

Table (14): Comparison between trial and placebo groups according to presence of postoperative sedation at 24 hours (n=163)

			Postoperative Sedation at 24 h		
			Not present	Present	**Total**
Group	T Group	No.	**77**	**10***	87
		%	88.5%	11.5%	100.0%
	P Group	No.	**31**	**45***	76
		%	40.8%	59.2%	100.0%
Total		No.	108	55	163
		%	66.3%	33.7%	100.0%

(P value = 0.0001, statistically significant)

Table (15): Comparison between trial and placebo groups according to analgesic requirements at 24 hours (n=163)

			Analgesic Drugs given in Doses					
			Panadol 1 Gram	Pethidine 25 mg	Pethidine 50 mg	Pethidine 75 mg	Pethidine 100 mg more	Total
Group	T Group	No.	**70***	**12***	**5***			87
		%	80.5%	13.8%	5.7%			100.0%
	P Group	No.	**16***	**24***	**25***	10	1	76
		%	21.1%	31.6%	32.9%	13.2%	1.3%	100.0%
Total		No.	86	36	30	10	1	163
		%	52.8%	22.1%	18.4%	6.1%	.6%	100.0%

(P value = 0.0001, statistically significant)

سم الله الرحمن الرحيم

Plate No. 1

جامعة الخرطوم

مستشفي سوبا الجامعي

قسم الجراحة

زمن الاختبار_____

اسم المريض _____

1- اختر فيما يلي درجة الإحساس بالألم مع مراعاة علي أقصي اليمين لا يوجد ألم مطلقاً و في أقصي اليسار أشد ألم ممكن

* *

لا يوجد ألم أقصي ألم

2- ضع علامة ✓ في المكان المناسب حسب درجة الألم الذي تحسه:

3- حدد درجة الألم :

- ☐ لا أحس بأي ألم مطلقاً (نهائياً)
- ☐ أحس بألم خفيف
- ☐ أحس بألم متوسط (مزعج نوعاً ما)
- ☐ أحس بألم شديد
- ☐ أحس بأقصى درجة ألم في تقديري (لم أحسه من قبل)

4- حدد درجة النشاط :

- ☐ امارس نشاط طبيعى
- ☐ اقوم بمعظم الانشطه
- ☐ توقفت عن معظم الانشطه
- ☐ توقفت عن الانشطه الطبيعيه
- ☐ لا أتحكم فى قيام بالانشطه

سم الله الرحمن الرحيم

Plate No. 1

جامعة الخرطوم

مستشفي سوبا الجامعي

قسم الجراحة

زمن الاختبار_____

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- ☐ اقوم بمعظم الانشطه
- ☐ توقفت عن معظم الانشطه
- ☐ توقفت عن الانشطه الطبيعيه
- ☐ لا أتحكم فى قيام بالانشطه

Plate No. 3
Face Description (A, B, C & D)