

**Evaluation of the Analgesic
Efficacy of Tenoxicam in
Comparison to Morphine**



Thesis Submitted for partial Fulfillment
of M.D. Degree in Anesthesiology

By

Wail Ahmed Mohamed

M.B.B. Che., M.Sc Faculty of Medicine, Ain Shams University

Supervised By

Prof.Dr. Nabil Mohamed Abd - El - Mooty

professor of Anesthesia and Intensive Care

Faculty of Medicine - Ain Shams University

Dr. Amir Ibrahim Salah

Assistant professor of Anesthesia and Intensive Care

Faculty of Medicine - Ain Shams University

Dr. Galal Abou - El - Sood Saleh

Assistant professor of Anesthesia and Intensive Care

Faculty of Medicine - Ain Shams University

Dr . Amr Mohamed El Saeed

Lecture of Anesthesia and Intensive Care

Faculty of Medicine - Ain Shams University

Faculty of Medicine

Ain Shams University

1997



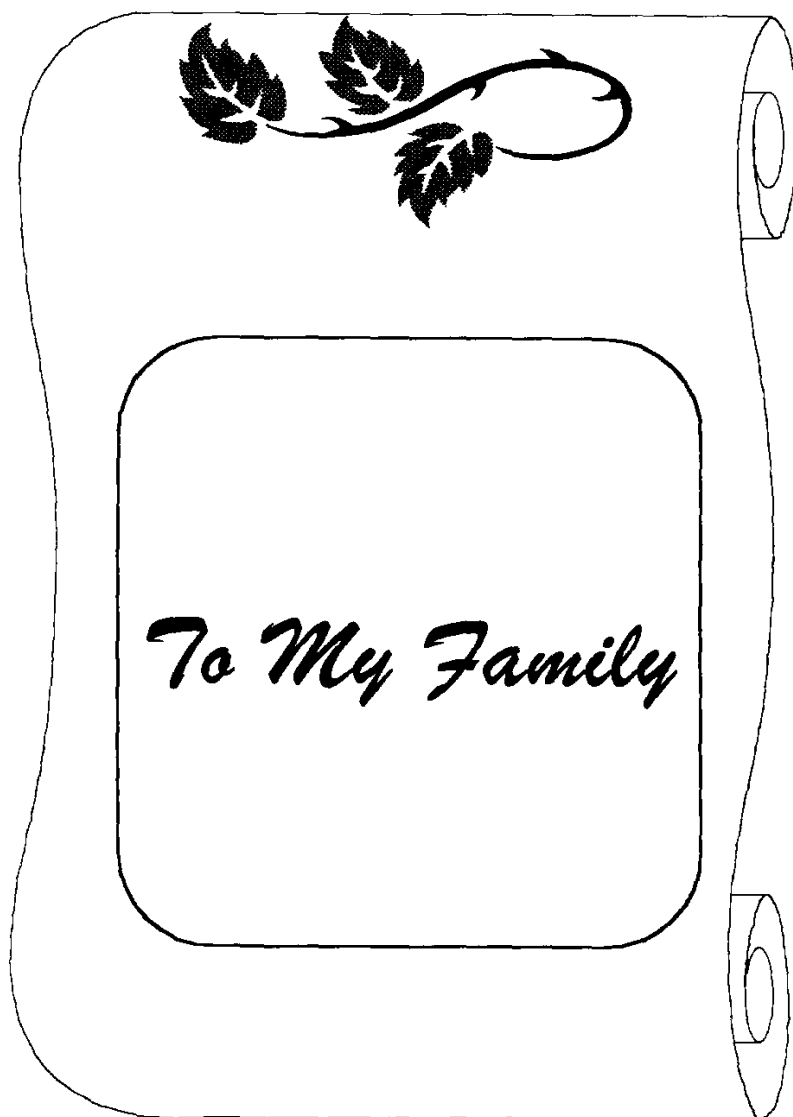
Handwritten signatures and notes:
Nabil H. Mooty
Wail Ahmed Mohamed
Amir Ibrahim Salah
Galal Abou El Sood Saleh
Dr. Amr Mohamed El Saeed

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قالوا سبحانك لا علم لنا إلا
ما علمتنا إنك أنت العليم
الحكيم

صدق الله العظيم





Acknowledgment

First, thanks are all due to **God** for blessing this work until it has reached its end, as a part of his generous help throughout my life.

I would like to direct special thanks to **Prof. Dr. Nabil Mohamed Abd-El-Mooty**, Professor of Anesthesia and Intensive Care, Faculty of Medicine, Ain Shams University, for the great support and encouragement he gave me throughout the whole work. It is a great honor to work under his guidance and supervision.

I would like to express my sincere gratitude to **Dr. Amir Ibrahim Salah**, Assistant Professor of Anesthesia and Intensive Care, Faculty of Medicine, Ain Shams University, for his close supervision, continuous help, and the tremendous effort he has done in the meticulous revision of the whole work.

Also, I am greatly honored to express my utmost thanks to **Dr. Galal Abou-El-Sood Saleh**, Assistant Professor of Anesthesia and Intensive Care, Faculty of Medicine, Ain Shams University, from whom I received faithful supervision, valuable suggestions, and continuous guidance throughout this work.

Wail Ahmed Mohamed

List of Contents

	PAGE
Introduction and Aim of the Work	1 - 2
Review of Literature	3 - 63
Physiology of Pain	3 - 23
Postoperative Pain	24 - 33
Non-steroidal Anti-inflammatory	34 - 51
Opioids	52 - 63
Patients and Methods	64 - 69
Results	70 - 168
Discussion	169 - 176
Conclusion	177
Summary	178 - 180
References	181 - 197
Arabic Summary	1 - 3

List of Tables

Table No.	Page	Table No.	Page
Table (1)	35	Table (20)	110
Table (2)	56	Table (21)	113
Table (3)	71	Table (22)	115
Table (4)	72	Table (23)	120
Table (5)	74	Table (24)	123
Table (6)	76	Table (25)	126
Table (7)	79	Table (26)	129
Table (8)	81	Table (27)	132
Table (9)	84	Table (28)	135
Table (10)	86	Table (29)	138
Table (11)	89	Table (30)	141
Table (12)	91	Table (31)	146
Table (13)	94	Table (32)	149
Table (14)	96	Table (33)	152
Table (15)	98	Table (34)	155
Table (16)	101	Table (35)	158
Table (17)	103	Table (36)	161
Table (18)	105	Table (37)	164
Table (19)	108	Table (38)	167

List of Figures

Figure No.	Page	Figure No.	Page
Figure (1)	7	Figure (23)	104
Figure (2)	10	Figure (24)	106
Figure (3)	13	Figure (25)	109
Figure (4)	15	Figure (26)	111
Figure (5)	27	Figure (27)	114
Figure (6)	45	Figure (28)	116
Figure (7)	47	Figure (29)	121
Figure (8)	48	Figure (30)	124
Figure (9)	61	Figure (31)	127
Figure (10)	62	Figure (32)	130
Figure (11)	75	Figure (33)	133
Figure (12)	77	Figure (34)	136
Figure (13)	80	Figure (35)	139
Figure (14)	82	Figure (36)	142
Figure (15)	85	Figure (37)	147
Figure (16)	87	Figure (38)	150
Figure (17)	90	Figure (39)	153
Figure (18)	92	Figure (40)	156
Figure (19)	95	Figure (41)	159
Figure (20)	97	Figure (42)	162
Figure (21)	99	Figure (43)	165
Figure (22)	102	Figure (44)	168

Introduction and Aim of the Work

Introduction

Relief of postoperative pain after surgery is provided traditionally by parenteral opioid analgesics or local anesthetic regimens.

Total postoperative pain relief cannot be achieved by a single agent or method without major expenditure on equipment and surveillance systems or without significant side effects and therefore recommended combined analgesic regimens (balanced analgesia).

After major surgery, an opioid is usually administered intramuscularly (I.M.) as required. In practice, because of fears about the potential for addiction and depression of ventilation, opioids are often withheld until the patient is in great discomfort. An I.M. injection given at this time will not bring rapid relief. Also, patient-controlled analgesia is effective but requires expensive equipment.

Opioids are generally unsuitable for acute pain after day-case surgery because of sedative action, and may cause unnecessary side effects.

Non opioid analgesics have been studied extensively in the postoperative period, but their potential contribution as the sole analgesic after minor or intermediate surgery or decreasing opioid requirements after major surgery.

The potential advantages of reduced opioid consumption after major surgery include a lower risk of ventilatory depression, improved cooperation and mobility because of reduced sedation, and more rapid restoration of bowel function.

Recent information on the role of arachidonic acid cascade metabolites to mediate pain and inflammation at the site of peripheral pain suggests that pharmacological modulation of the arachidonic acid cascade may be of value in balanced analgesia.

Non steroidal anti-inflammatory drugs (NSAIDs) have proved reliable in achieving postoperative pain after minor procedures and have an important role as adjuvants to other analgesics after major surgery (*Dahl and Kehlet, 1991*).

Tenoxicam is a relatively new thienothiazine derivative of the oxicam class of non-steroidal anti-inflammatory drugs. Tenoxicam has the advantages of I.V. formulation and a long half-life of plasma concentration (60 - 75 hours). It has negligible effects on ventilation, hemodynamics, and psychomotor control; making it an attractive alternative to opioids for surgical patients (*Merry et al., 1992*).

Aim of the Work:

The aim of this work is to evaluate the analgesic efficacy of tenoxicam in comparison to morphine.



Review of Literature

Physiology of Pain

Definition of Pain:

"Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage". Pain is a complex phenomenon that involves not only physical stimuli, sensory, physiologic and autonomic changes, but also cognitive functions, affective states and behavioral phenomenon. Also, pain is a protective mechanism to minimize damage that could be inflicted by contact with harmful factors in the environment (*Merskey, 1986*).

In contrast to most other sensory receptors of the body, the pain receptors do not adapt at all. In fact, under some conditions, the threshold of excitation of pain fibers becomes progressively lower and lower as the pain stimulus continues, thus allowing these receptors to become progressively more activated with time. This increase in sensitivity of pain receptors is called "hyperalgesia".

Failure of pain receptors to adapt is very important as it allows them to keep person informed of a damaging stimulus that causes the pain, as long as it persists (*Guyton, 1986*).

Between the site of active tissue damage and the perception of pain lies a complex series of electrochemical events, collectively called "nociception". Nociception involves four physiological processes (*Fields, 1987*):-