TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENT	iii
ENGLISH ABSTRACT	٧
THAI ABSTRACT	vii
LIST OF TABLES	х
LIST OF ILLUSTRATIONS	xii
LIST OF ABBREVIATIONS	xiv
INTRODUCTION	1
LITERATURE REVIEW	
The analgesic mechanisms of EA and diclofenac	4
The serum markers of cartilage metabolism in OA	6
OBJECTIVES	10
MATERIALS AND METHODS	
Research design	11
Subjects	11
Treatment procedures	11
Assessments	16
Quantitative measurement of serum markers of cartilage metabolism	16
Statistical analysis	19
RESULTS	20
DICUSSION	67
CONCLUSION	72
REFERENCES	73
APPENDIX	
A. Lequesne's functional index for OA of knee	80
B. WOMAC osteoarthritis index version LK 3.0	82
VITA	86

LIST OF TABLES

Table		Page
1	The selected acupuncture points used in this study.	13
	Demographic data of participants evaluated at the end of run-in period	26
2.1	(week 0).	20
2.2	Base-line data for the major outcome assessments of participants	27
	evaluated at the end of run-in period (week 0).	
2.3	Mean serum concentrations of cartilage markers of participants evaluated	28
	at the end of run-in period (week 0).	
3	The radiographic findings at entry into the study.	29
4	Percentage of the patients received previous OA treatments prior to this	30
	study.	
5	Percentage of the patients self-rated the outcome of previous OA	31
	treatment.	
6	Percentage of the patients used concomitant drug therapy during the	32
	study	
7	Reasons for withdrawal and time of withdrawal.	33
8	Changes in paracetamol consumption compared to the base-line values.	35
9	Median 100 mm VAS in each treatment group evaluated at the end of	37
	run-in period (week 0) and during treatment.	
10	Median WOMAC pain index in each treatment group evaluated at the end	39
	of run-in period (week 0) and during treatment.	
11	Median WOMAC stiffness index in each treatment group evaluated at the	41
	end of run-in period (week 0) and during treatment.	
12	Median WOMAC disability index in each treatment group evaluated at the	43
	end of run-in period (week 0) and during treatment.	
13	Median total WOMAC score (pain+stiffness+disability index) in each	45
	treatment group evaluated at the end of run-in period (week 0) and	
	during treatment.	

Table		Page
14	Median Lequesne's functional index in each treatment group evaluated at	47
	the end of run-in period (week 0) and during treatment.	
15	Changes in 50 feet-walk time compared to the base-line values.	49
16	Orthopedist's and patient's overall opinions evaluated at week 1.	50
17	Orthopedist's and patient's overall opinions evaluated at week 2.	51
18	Orthopedist's and patient's overall opinions evaluated at week 3.	52
19	Orthopedist's and patient's overall opinions evaluated at week 4.	53
20	Number of the patients considered to be responders in each treatment	54
	group.	
21	Percentage of patients experienced adverse events during treatment.	55
22	Number of responders considered at the end of the study (week 4) and	56
	at 1 and 2 month(s) after treatment.	
23	Changes in serum concentrations of HA compared to the base-line	62
	values.	
24	Changes in serum concentrations of CS 3-B-3(+) epitope compared to	64
	the base-line values.	
25	Changes in serum concentrations of CS W-F-6 epitope compared to the	66
	base-line values.	

LIST OF ILLUSTRATIONS

Figure		Page
1.1	The selected acupuncture points around right knee, demonstrated in	14
	sitting position, during treatment with true (A), and placebo EA (B).	
1.2	The pattern of electrical stimulation used in EA treatment.	15
2	Flow chart of randomization as well as dropout and withdrawal in the	25
	study.	
3	Average amount of paracetamol intake in each treatment group	34
_	during run-in period (week 0) and during treatment.	
4	Median 100 mm VAS in each treatment group evaluated at the end	36
	of run-in period (week 0) and during treatment.	
5	Median WOMAC pain index in each treatment group evaluated at	38
	the end of run-in period (week 0) and during treatment.	
6	Median WOMAC stiffness index in each treatment group evaluated	40
	at the end of run-in period (week 0) and during treatment.	
7	Median WOMAC disability index in each treatment group evaluated	42
	at the end of run-in period (week 0) and during treatment.	
8	Median total WOMAC score (pain+stiffness+disability index) in each	44
	treatment group evaluated at the end of run-in period (week 0) and	
	during treatment.	
9	Median Lequesne's functional index in each treatment group	46
	evaluated at the end of run-in period (week 0) and during	
	treatment.	
10	Mean 50 feet-walk time in each treatment group evaluated at the	48
	end of run-in period (week 0) and during treatment.	
11	Average amount of paracetamol tablets taken/week during run-in	57
	period (week 0), placebo or diclofenac phases (week 4) and EA	
	phase (week 8) in a partial cross-over study.	

Figure		Page
12	Median 100 mm VAS at the end of run-in period (week 0),	58
	placebo or diclofenac phases (week 4), and EA phase (week 8) in	
	a partial cross-over study.	
13	Median total WOMAC score at the end of run-in period (week 0),	59
	placebo or diclofenac phases (week 4), and EA phase (week 8) in	
	a partial cross-over study.	
14	Median Lequense's functional index at the end of run-in period	60
	(week 0), placebo or diclofenac phases (week 4), and EA phase	
	(week 8) in a partial cross-over study.	
15	Mean serum concentrations of HA over time.	61
16	Mean serum concentrations of CS 3-B-3(+) epitope over time.	63
17	Mean serum concentrations of CS W-F-6 epitope over time.	65

LIST OF ABBREVIATIONS

°C =degree Celsius

 μg = microgram

 μ l =microliter

BSA =bovine serum albumin

'cm =centimeter

CS =chondroitin sulphate

EA =electroacupuncture

GAGs =glycosaminoglycans

HA =hyarulonic acid

Hz =hertz

kg =kilogram

KS =keratan sulphate

M =molar

M:F =male: female

ml =milliliter

mm =millimeter

ng =nanogram

nm =nanometer

NSAIDs =non-steroidal antiinflammatory drugs

O-PD substrate =o-phenylenediamine

OA =osteoarthritis

PBS =phosphate buffer saline

SD =standard deviation

sec = second

SEM =standard error of mean

TE buffer =Tris-incubating buffer

Tris-HCI =Tris (hydroxymethyl)-aminomethane hydrochloride

Tween =polyoxyethylene sorbitan monolaurate

VAS =visual analog score

WOMAC

=the Western Ontario and McMaster Universities

yr

=year