CHAPTER 6

RESULTS OF THE STUDY

Demographic data

There were 80 patients enrolled in the study, 20 patients in each group. The descriptive demographic data (age, weight, height, body mass index (BMI), and surgical time were shown in table 6.1. The gravid, para and education level were shown in table 6.2. There were no statistical differences in all these variables among 4 groups of patients.

Pain relief

1.Numerical Rating Score (NRS) for pain

In table 6.3 and figure 6.1, the mean and 95 % CI of NRS rated before giving fentanyl (NRS before) were 5.7 (4.8-6.5), 6.6 (5.7-7.5), 2.3 (1.3-3.4) and 13 (0.4-2.1) in the control group(group I) , morphine group (group II), lidocaine group (group III) and lidocaine plus morphine group (group IV) respectively. The mean and 95% CI of maximal NRS in each patient or the NRS rated before giving ketamine (NRS maximum)

were 7.3 (6.3-8.3), 7.6 (6.5-8.6), 2.7 (1.4-4.0) and 1.5 (0.4- 2.6) in each group respectively . There were statistical differences of NRS before and NRS maximum between group I (control)or group II (morphine) versus group III (lidocaine) or group IV (lidocaine + morphine)

($p < 0.001$), but there were no statistical differences between group I and group II or group III and group IV.

In Table 6.4, by using simple factorial analysis, there were statistical differences between the NRS rated before giving the rescue drug (NRS before) for the main effects of combined "without lidocaine" group(I+II) and "with lidocaine" group (III+IV) ($p<0.001$) but there were no statistical differences between the main effects of combined "without morphine" group (I+III) and "with morphine" group(II+IV) ($p=0.433$). There was no interaction effects between lidocaine and morphine on the NRS before ($p = 0.418$).

2. Percentage of patients according to the requirement of rescue drugs.

In table 6.6 and figure 6.2, there were significant differences in the proportion of patients in each group according to the usage of rescue drug (grade 1 = no rescue drug, grade 2 = use only fetanyl, grade 3 = use fentanyl and ketamine including general anesthesia)

($p < 0.001$). In figure 6.3, the proportion of patients who needed no rescue drugs (85%) in groups with lidocaine (III, IV) was significant higher than 20% in groups without lidocaine (I, II) ($p < 0.001$) but there was no significant difference in the proportion of patients who needed no rescue drugs between the groups with morphine (II, IV) and the groups without morphine (I, III). Figure 6.4 shows the percentage of patients who needed no rescue drugs the upper line shows the percentage of patients in the groups with lidocaine (III, IV) and the lower line shows the percentages of patients in the groups without lidocaine (I, II). The interaction effects between lidocaine and morphine on the percentage of patients could not be proved in this study ($p = 0.69$).

3. Rescue drugs

(Table 6.3) The fentanyl usage in the groups with lidocaine (III, IV) were significantly less than in the groups without lidocaine (I,II). Although the ketamine usage was not significant difference among the group ($p = 0.112$), by using factorial ANOVA in table 6.5, there were significant differences in the usage of ketamine in the groups with lidocaine (III, IV) and the groups without lidocaine (I, II) ($p = 0.026$). There were no significant differences in the usage of ketamine in the groups with morphine (II, IV) and the groups without

morphine (I, III) (p = 0.387) and there was no interaction effect between lidocaine and morphine on the ketamine usage (p = 0.603).

In table 6.3, although there were no significant differences in ketamine used among the 4 groups (p = 0.112), in table 6.5, by using simple factorial analysis to see the main effect of drugs, there were statistical differences between the use of ketamine in the "without lidocaine" group (I + II) and the "with lidocaine" group (III + IV) (p = 0.026) but there were no significant differences between the use of ketamine in the "without morphine" group (I + III) and the "with morphine" group (II + IV) (p = 0.387).

4. Expulsion of the abdomen

The percent of patients who had expulsion of abdomen due to pain and interrupted the process of the operation were compared among the 4 groups. In Table 6.6, 50% of the patients in the control group (gr. I) had abdominal expulsion as compared to 20%, 10% and 0% in morphine group (gr. II), lidocaine group (gr. III) and lidocaine plus morphine group (gr. IV) respectively. By using the chi - Square test, the p value was 0.01, but 4 cells (50%) had the expected count less than 5.

In Table 6.7, when comparing the number of patients with expulsion of the abdomen between the "with lidocaine" group (III + IV)

and the "without lidocaine" group (I + II) there were significant differences between these two groups ($p < 0.001$). In Table 6.8, when comparing the number of patients with expulsion oft he abdomen in "with morphine" group (II + IV) and the "without morphine" (I + III) there were no significant differences between these groups ($p = 0.05$). In Table 6.9, the interaction effect of morphine and lidocaine on the number of patients having expulsion of the abdomen against pain could not be found in this study ($p = 0.09$).

Hemodynamic changes

Hemodynamic changes were compared among the 4 groups by using the maximum and minimum changes of systolic and diastolic blood pressure and the pulse rate as shown in Table 6.10. By using one way ANOVA, there were no significant differences in hemodynamic changes among these groups.

Blood lidocaine levels

In Figure 6.5, blood lidocaine levels at time 0,5, 15, 30, 45, 60, 120 minutes were compared among the 4 groups. There were significant differences in the blood lidocaine levels at 5, 15, 30, 45, 60, and 120 minutes after the intraperitoneal instillation but not at the beginning of the instillation. By multiple comparison, there were significant differences in

blood lidocaine levels between the groups using intraperitoneal lidocaine (gr. III and gr. IV) and the group not using it (gr. I and gr. II) ($p < 0.001$). The highest blood lidocaine level, 2.67 μgm./ml. At 30 minutes after the instillation which was in lidocaine group (gr. III) was far below the toxic level (9-10 μgm./ml.).

Postoperative pain and paracetamol used

Table 6.11 shows the NRS which were rated hourly in the recovery room for 2 times, NRS which were rated every 3 hours for 7 time at the ward (Hr 3, 6, 9, 12, 15, 18, 21 and 24) and the numbers of paracetamol tablets used within 24 hours. There were no significant differences in these variables among the 4 groups. There was only one patient in gr. I who forgot to evaluate the postoperative pain before she was discharged home.

Complications and side effects

Table 6.12, showed number of patients with complications and side effects such as decreased oxygen saturation during the operation (PaO_2 by pulse oximetry < 95%), nausea, vomiting, dizziness, bleeding from omentum during surgical manipulation, chill, diarrhea, fever. No patient had the problems of urine retention or ileus as had been expected for the effect of lidocaine on bladder and bowels. All patients were discharged

home on the first postoperative day except few who desired to stay a few days more due to their babies's problems.

Cost effectiveness analysis

From the health care provider's perspective, calculation of cost / case and incremental cost effectiveness analysis were done and compared between the groups (Table 6.13). We calculated only for direct medical cost which were drugs, equipment and labour cost. We did not include direct non medical cost such as the operating room cost since the building was very old. Although we could have estimated the price from a near-by private hospital, the surgical times were not significantly different among the groups and would have resulted in operating room cost.

Equipment cost (anesthetic machine and monitoring) was calculated by using the formula (Drummon, Stoddart, and Torrance, 1987)

$$E = \frac{K - \frac{S}{(1+r)^n}}{A(n, r)}$$

E = equipment annual cost

K = purchase price

A (n, r) = the annual factor (n years at interest rate r)

r = discount (interest rate)

n = the useful life of the equipment

S = the resale value

For example :

Anesthetic machine, S = 0 because there is no permission to resale,

n = 15 years, r = 10%, A (15, 10) = 7.61, K = 450,000 bahts then

$$E = \frac{\dfrac{450{,}000 - 0}{(1+10)^{15}}}{7.61} = 59{,}132.72 \text{ bahts/year}$$

working hours in one year = official day/ yr. X official hr. /day

= 240 x 8

= 1920 hr. / yr.

Anesthetic machine cost/hr. = $\frac{59{,}132.72}{1920}$ = 30.80 baht/hr.

Cost for general anesthesia = labour cost + equipment cost + drug cost

labour cost = anesthesiologist + nurse anesthetist's salary

equipment cost = cost for anesthetic machine + monitoring system (noninvasive blood pressure monitoring, electrocardiogram and pulse oximetry)

drug cost = cost for thiopenthal sodium, s. choline, nitrous oxide, oxygen and halothane

From the study of Chevawattana S, et al. (to be published), equipment and drugs for general anesthesia (GA) = 14.61 bahts / min. and labour cost =4.03 bahts/min. In this study, GA was used in the control, morphine, lidocaine and morphine plus lidocaine groups for 35, 0, 20 and 10 minutes respectively. Table 6.13. shows the total direct medical cost, cost per effectiveness rate and incremental cost effectiveness ratio (CER) among the 4 groups. Although the total cost for the groups with lidocaine (III and IV) was more than the groups without lidocaine (I and II), the cost used to increase each one percent of the patient who needed no rescue drugs were less (22.55 and 20.00 Baht / % in group III and IV as compared to 89.35 and 72.25 Baht / % in group I and II). When comparing CER between group II (conventional method) and group IV (method that would be our recommendation), we paid only 25.50 Baht to get one patient having none to mild pain (needed no rescue drugs).

	Group I	Group II	Group III	Group IV	p value
Age	30.5 ± 5.2	30.6 ± 5.4	29.5 ± 6.3	26.9 ± 3.9	0.104
(yr.)	(19.0 - 31.0)	(21.0 - 34.0)	(20.0 - 44.0)	(21.0 - 44.0)	
weight	55.1 ± 15.3	61.0 ± 9.1	58.2 ±10.7	63.2 ± 10.5	0.157
(kg.)	(43.0 - 76.0)	(49.0 - 78.0)	(40.0 - 79.0)	(43.0 - 83.0)	
Height	155.6 ± 4.3	155.9 ± 5.9	152.7 ± 4.5	154.7 ± 4.0	0.237
(cm.)	(148.0 -165.0)	(49.0 -167.0)	(145.0 - 161.0)	(140.0 - 167.0)	
BMI	22.8 ± 6.7	25.1 ± 3.5	24.9 ± 4.2	26.3 ± 3.5	0.146
(kg. / m^2)	(18.2 - 33.3)	(19.0 - 31.2)	(34.4 - 17.7)	(20.9 - 32.8)	
Surgical duration	26.9 ± 11.4	25.6 ± 9.8	25.1 ± 18.0	21.5 ± 10.1	0.592
	(10.0 - 60.0)	(10.0 - 50.0)	(15.0 - 50.0)	(10.0 - 80.0)	

Table 6.1 This table shows the demographic data of the patients and surgical duration time in mean ±SD (range). There were no statistically significant differences in age, body weight, height, body mass index and surgical duration among the groups.

	Group I	Group II	Group III	Group IV	p value
Gravid 2	7 (35 %)	6 (30 %)	10 (50 %)	11 (55 %)	0.377
3	9 (45 %)	13 (65 %)	8 (40 %)	8 (30 %)	
≥ 4	4 (20 %)	1 (5 %)	2 (10 %)	3 (15 %)	
Para 1	0 (0 %)	1 (5 %)	0 (0 %)	1 (5 %)	0.375
2	11 (55 %)	9 (45 %)	12 (60 %)	13 (65 %)	
≥ 3	9 (45 %)	10 (50 %)	8 (40 %)	6 (30 %)	
Education level					
primary	12 (60 %	14 (70 %)	16 (80 %)	15 (75 %)	0.782
secondary	7 (35 %)	5 (25 %)	3 (15 %)	5 (25 %)	
college	1 (5 %)	1 (5 %)	1 (5 %)	0 (0 %)	

Table 6.2 This table shows the number (and percentage) of gravid, para and education levels.

	Group I mean ± SD (95% CI)	Group II mean ± SD (95% CI)	Group III mean ± SD (95% CI)	Group IV mean ± SD (95% CI)	p valve
NRS before	5.7 ± 1.9 (4.8 - 6.5)	6.6 ± 1.9 (5.7 - 7.5)	2.3 ± 2.3 (1.3 -3.4)	1.3 ± 16 (0.4 - 2.1)	< 0.001
NRS maximum	7.3 ± 2.1 (6.3 - 8.3)	7.6 ± 2.3 (6.5 - 8.6)	2.7 ± 2.7 (1.4 - 4.0)	1.5 ± 2.3 (0.4 - 2.6)	< 0.001
Fentanyl (mgm)	70.0 ± 41.0 (5.8 - 89.2)	75.0 ± 41.3 (55.6 - 94.3)	20.0 ± 41.0 (0.8 -39.2)	7.5 ± 24.4 (3.9 - 18.9)	< 0.001
Ketamine (mg.)	15.0 ± 17.0 (7.0 - 22.9)	10.0 ± 14.9 (3.0 - 16.9)	5.0 ± 15.3 (2.2 12.2)	4.0 ± 16.7 (3.8 16.8)	0.112

Table 6.3 This table shows NRS pain scores before using any rescue drug (NRSbefore), the maximum NRS score in each patient (including the score after giving fentanyl but before giving ketamine)(NRS maximum) and the dose of fentanyl or ketamine given . There were significant differences between NRSbefore, NRS maximum and fentanyl usage between the "without lidocaine" groups (group I, group II) and the "with lidocaine" groups (group III, group IV) but there was no significant difference between group I and group II or group III and group IV.There were no significant differences in ketamine usage among the four groups.

```
VARIABLES=nrsbefor
BY lidocain(0 11) morphine(0 11)
/MAXORDERS ALL
/METHOD UNIQUE .
```

ANOVA

Case Processing Summary[a]

Cases					
Included		Excluded		Total	
N	Percent	N	Percent	N	Percent
80	100.0%	0	.0%	80	100.0%

a. NRSBEFOR by LIDOCAIN, MORPHINE

ANOVA[a,b]

			Unique Method				
			Sum of Squares	df	Mean Square	F	Sig.
NRSBEFOR	Main Effects	(Combined)	460.850	2	230.425	37.718	.000
		LIDOCAIN	460.800	1	460.800	75.427	.000
		MORPHINE	5.0E-02	1	5.0E-02	.008	.928
	2-Way Interactions	LIDOCAIN * MORPHINE	4.050	1	4.050	.663	.418
	Model		464.900	3	154.967	25.366	.000
	Residual		464.300	76	6.109		
	Total		929.200	79	11.762		

a. NRSBEFOR by LIDOCAIN, MORPHINE

b. All effects entered simultaneously

Table 6.4 This table shows the main effect of lidocaine or morphine on the NRS before using any rescue drug (NRS before)and the interaction effects of lidocaine and morphine on NRS before.There was significant difference in the main effect of lidocaine on NRS before (p < 0.001) but no difference in the main effect of morphine on NRS before (p = 0.928)and there was no interaction effect of lidocaine and morphine on NRS before (p = 0.418).

```
GET
  FILE='C:\Program Files\SPSS\intra3.sav'.
EXECUTE .
ANOVA
  VARIABLES=ketamine
  BY lidocain(0 1) morphine(0 1)
  /MAXORDERS ALL
  /METHOD UNIQUE .
```

ANOVA

Case Processing Summary[a]

Cases					
Included		Excluded		Total	
N	Percent	N	Percent	N	Percent
80	100.0%	0	.0%	80	100.0%

a. KETAMINE by LIDOCAIN, MORPHINE

ANOVA[a,b]

			Unique Method				
			Sum of Squares	df	Mean Square	F	Sig.
KETAMINE	Main Effects	(Combined)	1515.625	2	757.813	2.939	.059
		LIDOCAIN	1320.313	1	1320.313	5.121	.026
		MORPHINE	195.312	1	195.312	.758	.387
	2-Way Interactions	LIDOCAIN * MORPHINE	70.312	1	70.312	.273	.603
	Model		1585.938	3	528.646	2.051	.114
	Residual		19593.7	76	257.812		
	Total		21179.7	79	268.097		

a. KETAMINE by LIDOCAIN, MORPHINE

b All effects entered simultaneously

Table 6.5 This table shows the main effects of lidocaine or morphine on the usage of ketamine. There was significant difference in the main effect of lidocaine on the usage of ketamine (p = 0.026) but no difference in the main effect of morphine on the usage of 7 ketamine (p = 0.387) There was no interaction effect between morphine and lidocaine on the usage of ketamine (p = 0.603).

	Group I no (%)	Group II no (%)	Group II no (%)	Group IV no (%)	p value
Grade 1	4 (20)	4 (20)	16 (80)	18 (90)	<0.001
Grade 2	6 (30)	9 (45)	2 (10)	1 (5)	
Grade 3	10 (50)	7 (35)	2 (10)	1 (5)	
Expulsion	10 (50)	4 (20)	2 (10)	0 (0)	

Table 6.6 This table shows the number and percentage of the patients who needed no rescue drug (grade1), needed only fentanyl (grade 2), needed fentanyl and ketamine (grade 3) and number and percentage of the patients who had the expulsion of the abdomen due to pain.

Exposure	Expulsion +	Expulsion -	
	2	38	40 of "with lidocaine" gr.(III, IV)
	14	26	40 of "without lidocaine" gr. (I, II)
E	16	64	80

	Chi-Squares	P-values
Uncorrected :	11.25	0.0007962
Mantel-Haenszel:	11.11	0.0008589
Yates corrected:	9.45	0.0021079

Odds ratio = 0.10 (0.01 <OR< 0.51*) +
Cornfield 95% confidence limits for OR
*Cornfield not accurate. Exact limits preferred.
Relative risk = 0.14 (0.03 <RR< 0.59)
Taylor Series 95% confidence limits for RR E
Ignore relative risk if case control study.

Table 6.7 This table shows the number of patients who had expulsion of the abdomen. There were 2 in " with lidocaine " group (group III, group IV) and 14 in "without lidocaine" group (group I, Group II) and this shows significant differences (p = 0.002).

Exposure	Expulsion +	Expulsion -	
	4	36	40 of "with morphine" gr.
	12	28	40 of "without morphine gr.
E	16	44	80 total

Analysis of Single Table
Odds ratio = 0.58 (0.13 <OR< 2.44*)
Cornfield 95% confidence limits for OR
*Cornfield not accurate. Exact limits preferred.
Relative risk = 0.67 (0.25 <RR< 1.81)
Taylor Series 95% confidence limits for RR
Ignore relative risk if case control study.

	Chi-Squares	P-values
Uncorrected :	5.00	0.0253473
Mantel-Haenszel:	4.94	0.0262800
Yates corrected:	3.83	0.0503993

Table 6.8 This table shows the number of patients who had expulsion of the abdomen. There were 4 in " with morphine group (group II, group IV) as compared to 12 in "without morphine" group (group I, group III). There were no significant differences between these groups (p = 0.0503).

(" with lidocaine" gr.)

morphine	Expulsion +	Expulsion -	
-	2	18	20
+	0	20	20
	2	38	40

(" without lidocaine" gr.)

morphine	Expulsion +	Expulsion -	
-	10	10	20
+	4	16	20
	14	26	40

*Cornfield not accurate. Exact limits preferred.
Relative risk = 2.50 (0.94 <RR< 6.66)
Taylor Series 95% confidence limits for RR
Ignore relative risk if case control study.

Chi-Squares		P-values
Uncorrected	: 3.96	0.0467033
Mantel-Haenszel:	3.86	0.0495346
Yates corrected:	2.75	0.0974217

Table 6.9 This table shows the interaction effect of morphine on lidocaine on the number of patients having expulsion of the abdomen. By using Epi info program , 2 x 2 tables for the" with lidocaine" group (left) and used F2 for more strata for the " without lidocaine" group (right), there were no interaction effects of morphine on lidocaine on the number of patients who had expulsion of the abdomen (p = 0.09).

	Group I mean ± SD (95 % CI)	Group II mean ± SD (95 % CI)	Group III mean ± SD (95 % CI)	Group IV mean ± SD (95 % CI)	p
Systolic BP (mm Hg)					
maximum	135.1 ±11.0 (129.9 -140.0)	137.8 ± 16.5 (130.9 -145.5)	131.8±16.44 (124.1 -139.5)	129.1±13.5 (122.7 -135.4)	0.261
minimum	116.5±12.3 (110.7 -122.3)	120.2±12.4 (114.4 -128.0)	119.8±13.1 (113.7 -125.9)	115.9±31.3 (101.2 -130.5)	0.845
Diastolic BP (mm.Hg)					
maximum	81.5±10.1 (76.7 -86.2)	85.2±9.6 (80.7 -89.7)	84.1±10.5 (79.1 -89.0)	81.5±8.3 (77.2 - 85.0)	0.474
minimum	72.4±11.2 (67.1 -77.7)	73.2±11.1 (67 9 -78.4)	76.0±10.0 (71.3 -80.6)	73.2±9.0 (68.9 -77.4)	0.716
Pulse (beat/min)					
maximum	89.6±13.9 (83.1 -96.1)	88.6±13.5 (82.2 -94.9)	91.2±9.7 (86.6 -95.7)	87.9±12.9 (81.8 -94.0)	0.861
minimum	75.5±9.6 (71.3 -80.4)	77.7±11.8 (72.2 -83.2)	81.4±10.1 (76.6 -86.1)	78.1±10.9 (73.0 -83.2)	0.436

Table 6.10 This table shows the maximal and minimal changes of systolic, diastolic BP and pulse during the operation in the four groups. There were no significant differences in these variables ($p > 0.05$).

	Group I mean ± SD (95 % CI)	Group II mean ± SD(95 % CI)	Group III mean ± SD(95 % CI)	Group IV mean ± SD (95 % CI)	p
NRS in R. R.					
first hr.	1.7±2.0 (0.7-2.7)	2.2±1.8 (1.4-3.1)	2.2±2.6 (1.0-3.4)	1.4±2.0 (0.4-2.4)	0.579
second hr.	1.7±2.1 (0.7-2.8)	1.9±1.7 (1.1-2.8)	2.0±2.1 (1.0-3.0)	1.1±1.5 (0.4-1.8)	0.472
NRS in ward, Hr. 3	2.7±2.2 (1.6-3.8)	2.7±1.9 (1.7-3.6)	2.5±1.7 (1.6-3.3)	1.6±1.6 (0.9-2.4)	0.251
Hr. 6	2.4±1.9 (1.5-3.4)	3.3±2.2 (2.2-4.3)	2.8±2.1 (1.8-3.8)	2.0±1.2 (1.4-2.5)	0.196
Hr. 9	2.8±2.4 (1.7-4.0)	3.2±2.4 (2.1.-4.3)	2.3±1,8 (1.4-3.2)	2.1±1.4 (1.4-2.7)	0.306
Hr.12	2.4±2.3 (1.3-3.5)	3.5±2.8 (2.1-4.8)	2.9±1.6 (2.1-3.7)	2.1±1.7 (1.3-2.9)	0.233
Hr.15	2.7±2.1 (0.4-1.7)	3.1±2.3 (2.0-4.1)	2.8±1.3 (2.2-3.4)	2.3±2.0 (1.3-3.2)	0.643
Hr.21	2.0±1.5 (1.3-2.7)	3.1±2.5 (1.9-4.3)	2.9±1.5 (2.1-3.6)	1.7±1.5 (1.0-2.4)	0.055
Hr.24	2.0±1.5 (1.3-2.7)	1.9±1.5 (1.1-2.6)	2.3±1.5 (1.6-3.0)	1.5±1.0 (1.0-2.0)	0.643
Paracetamol (tablet)	6.7±2.7 (5.4-8.1)	6.7±2.6 (5.4-7.9)	6.3±1.9 (5.4-7.9)	6.8±3.4 (6.0-7.2)	0.931

Table 6. 11 This table shows the NRS scores and the number of paracetamol (500 mg.)tablets used in the recovery room and in the ward. There were no significant differences.

Side effects	gr.I (control)	gr.II (morphine)	gr. III (lidocaine)	gr.IV (mo.+lido).
Vomiting	-	2	-	-
Dizziness	1	-	-	-
O2 Sat < 95 %	1	2	1	-
Bleeding omentum	-	2	-	-
Shivering	-	1	-	-
Diarrhea	-	-	1	-
Fever	-	-	1	-
Urine retention	0	0	0	0
Ileus	0	0	0	0

Table 6.12 This table shows side effects in the operating room and within 24 hours in the ward.

Cost (Baht)	I (control)	II(morphine)	III (lidocaine)	IV (mo.+lido.)
1% lidocaine (31 Baht / 20 ml.)	610	610	610	610
2% lidocaine (34. 24 Baht /20 ml.)			684.80	684.80
morphine (13 Baht / 10 mg.)		260		260
fentanyl (35 Baht / ampoule)	490	525	140	52.50
ketamine (16 Baht/ ml.)	96	48	32	24
General Anesthesia				
Equipment & drugs (14.61 Baht / min.)	511.35	0	292.20	146.10
Labour cost (2.28 Baht / min.)	79.80	0	45.60	22.80
Total cost	**1787.15**	**1443.00**	**1804.60**	**1800.20**
No. of patients with none to mild pain (NRS < 5)	4(20%)	4 (20%)	16(80%)	18(90%)
Cost per effectiveness rate	$\frac{1787.15}{20\%}$	$\frac{1443.00}{20\%}$	$\frac{1804.20}{80\%}$	$\frac{1800.20}{90\%}$
	= 89.35 Baht/%	**= 72.15 Baht/%**	**= 22.55baht/%**	**= 20.00Baht/%**
Incremental cost effectiveness ratio (CER) between gr. IV and gr. II)	=	$\frac{\textbf{1800.20 - 1443.20}}{\textbf{18 - 4}}$		= $\frac{\textbf{357}}{\textbf{14}}$
				= 25.50 Baht/case

Table 6.13 This table shows direct medical cost in each group. The unit cost were taken from: Chevawattana S, Lertakayamanee J, Chaatprom S, et al. Direct medical cost of anesthesia in Siriraj hospital.(to be published)

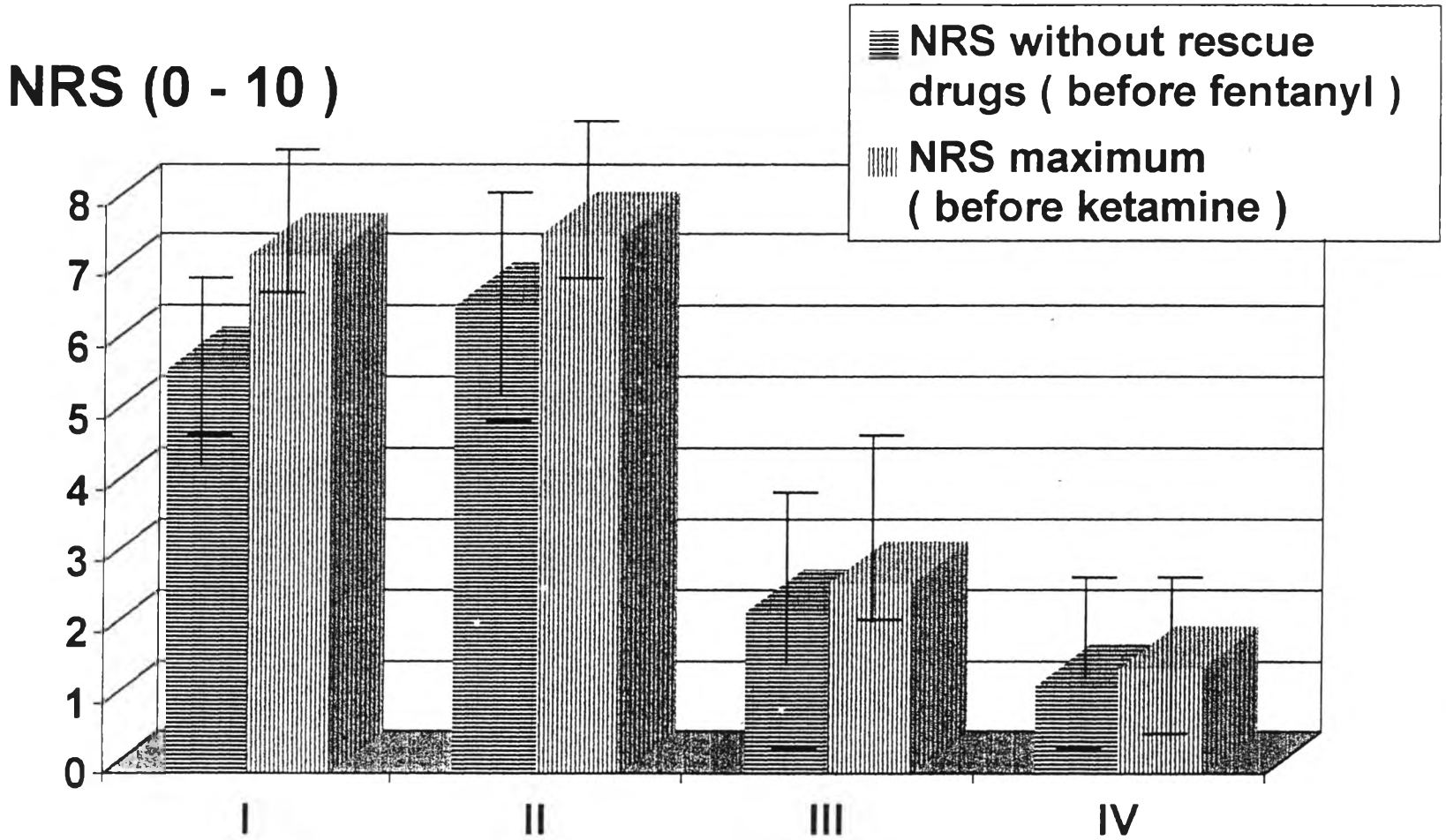


Figure 6.1 This figure shows mean and 95% CI of the Numerical Rating Score (NRS) for pain rated without rescue drugs (before fentanyl) and NRS maximum or NRS rated before ketamine. Both NRS in group III and IV were significantly less than in group I and II, ($p < 0.001$) but there were no significant differences of both NRS between group I and II or group III and IV.

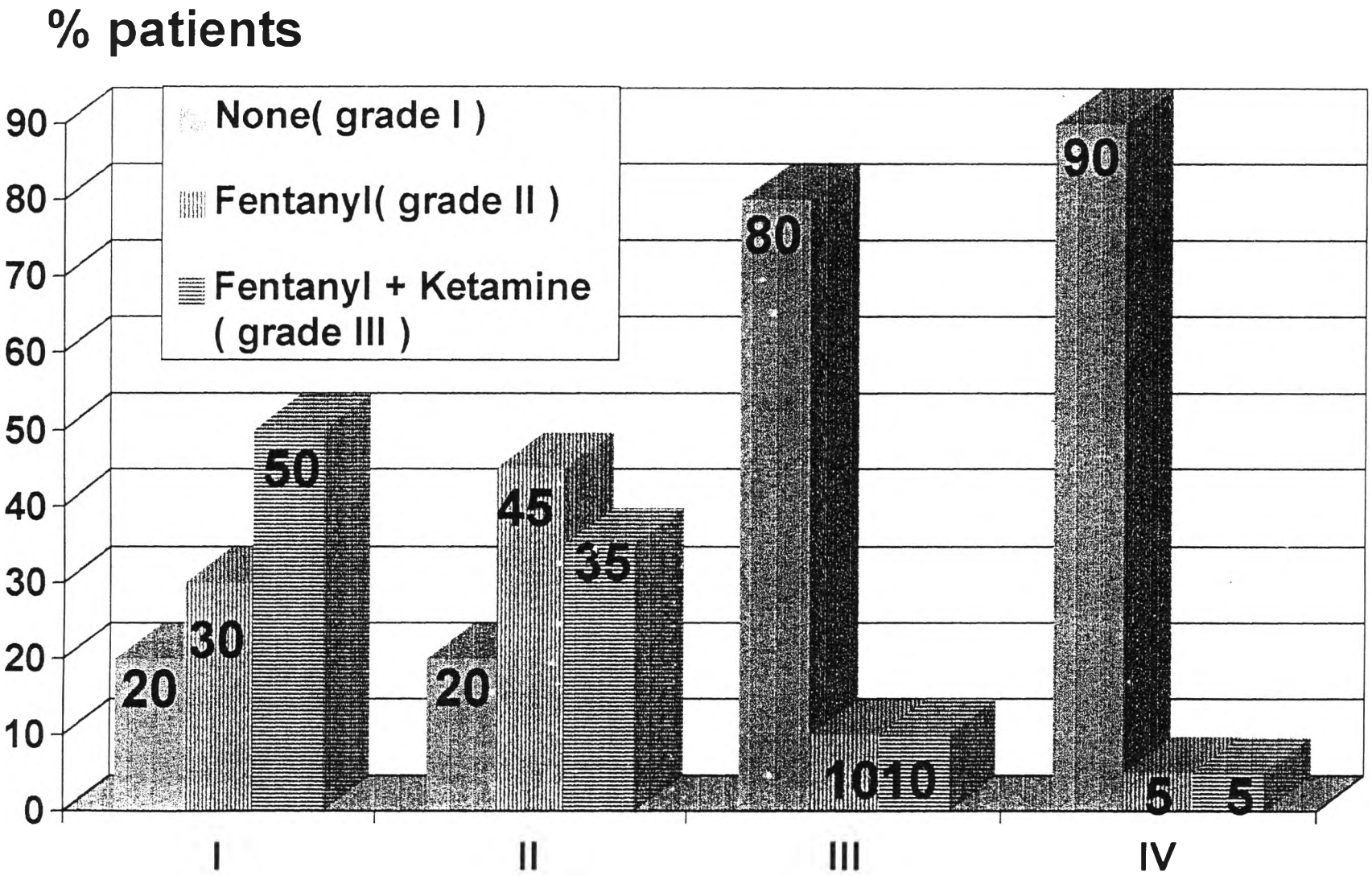
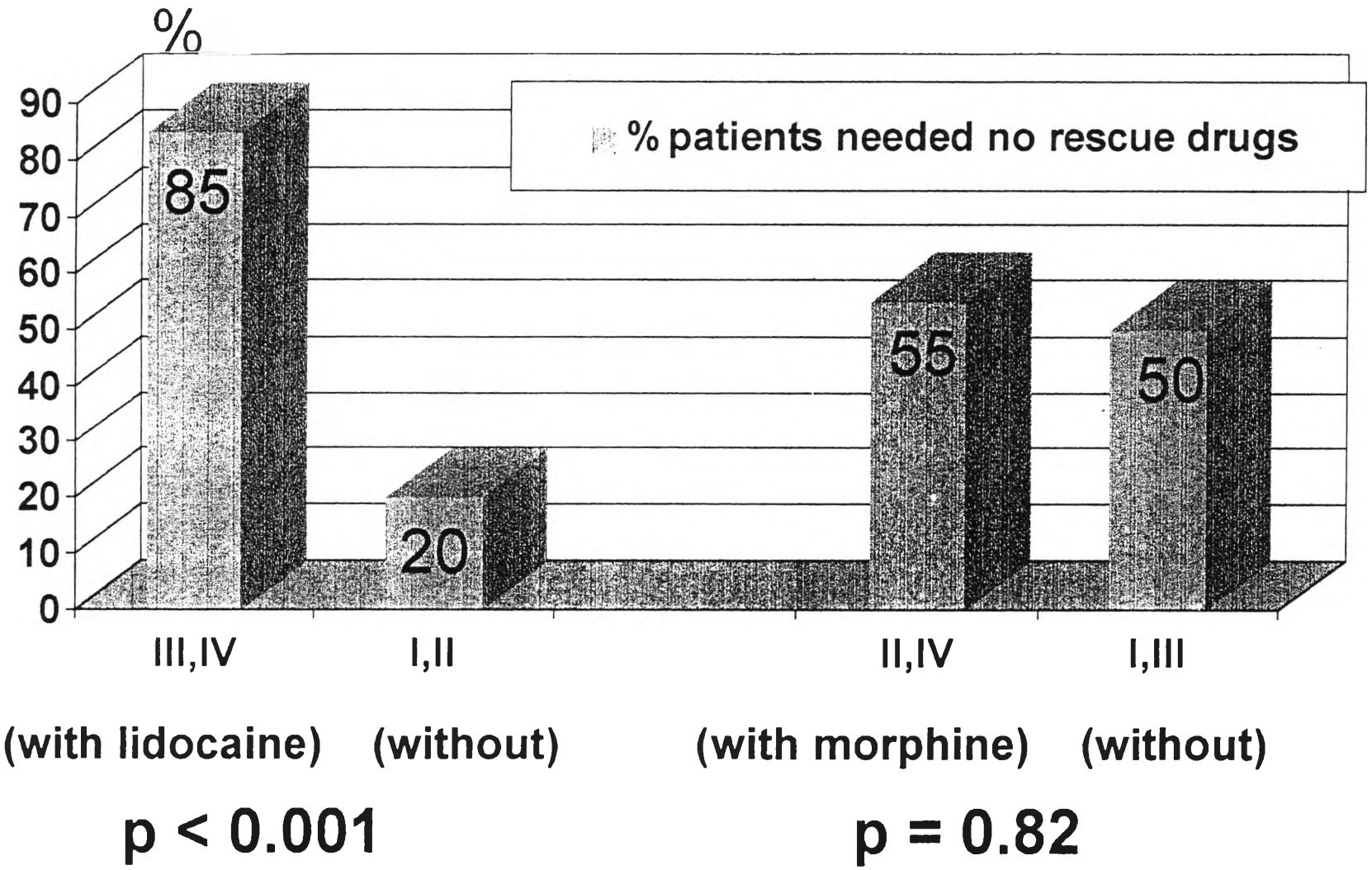


Figure6.2 This figure shows the proportion of patients who needed no rescue drugs (grade I), needed only fentanyl (grade II),needed fentanyl and ketamine or general anesthesia. (grade III). Eighty to ninety percent of patients in groups with lidocaine (III, IV) who needed no rescue drugs were significantly higher than 20 %of patients who needed no rescue drugs in groups without lidocaine (I, II) ($p < 0.001$) but there were no significant differences in the requirement of patients on rescue drugs between group I and II or group III and IV.



gure 6.3 This figure shows the main effect of lidocaine or morphine on the proportion of patients who needed no rescue drugs. Proportion of patients who needed no rescue drugs (85 %) in the groups with lidocaine (III,IV) was significantly higher than 20 % in groups without lidocaine (I,II }($p < 0.001$) but there was no significant differences in the proportion of patients who needed no rescue drugs between the groups with morphine (II,IV) and the groups without morphine (I,III).

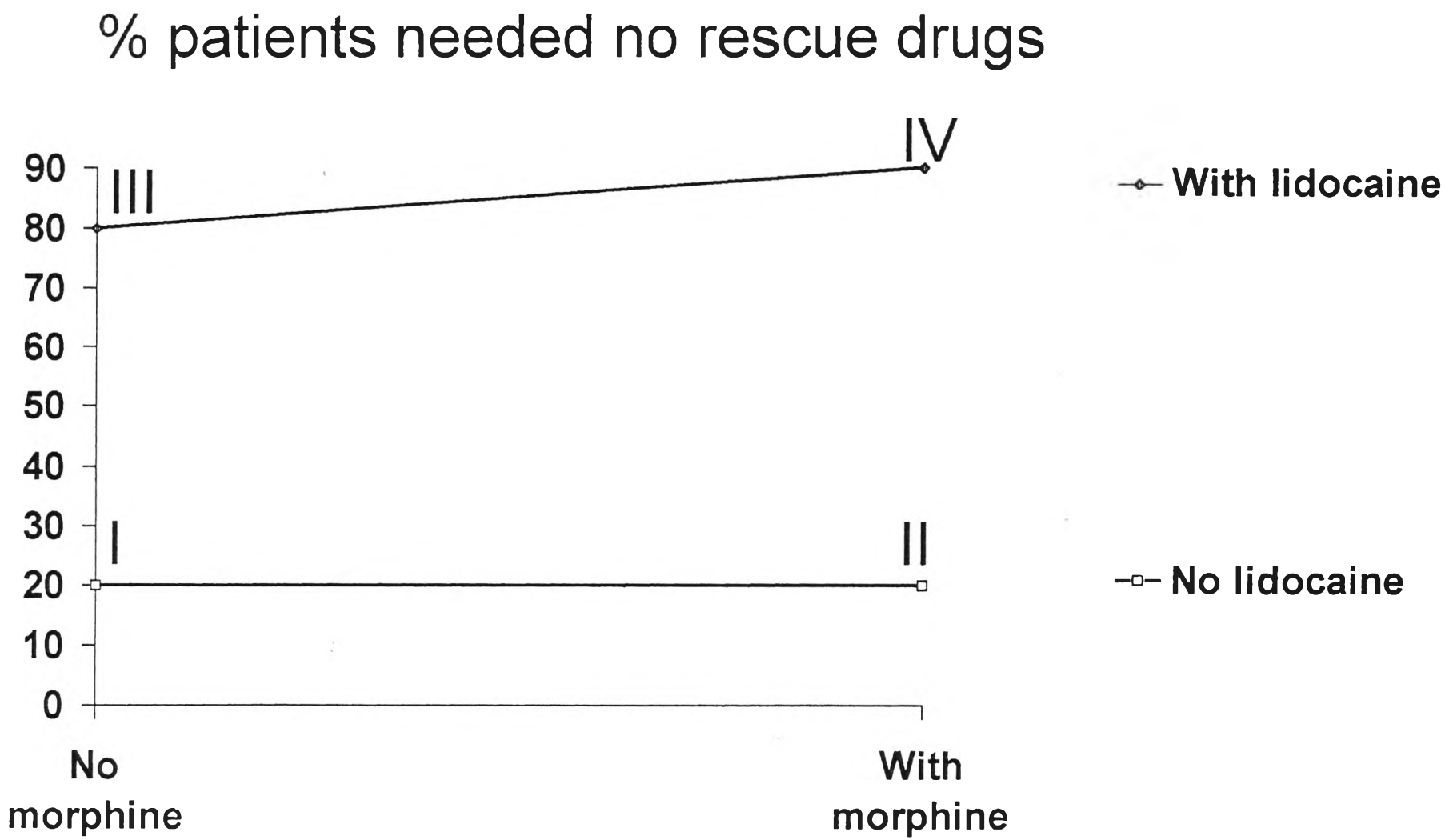


Figure 6.4 This figure shows the percentage of patients who needed no rescue drugs. The upper line shows the percentage of patients in the group with lidocaine (III, IV) and the lower line shows the percentage of patients in the group without lidocaine (I,II) . The interaction effects could not be proved in this study (p = 0.69).

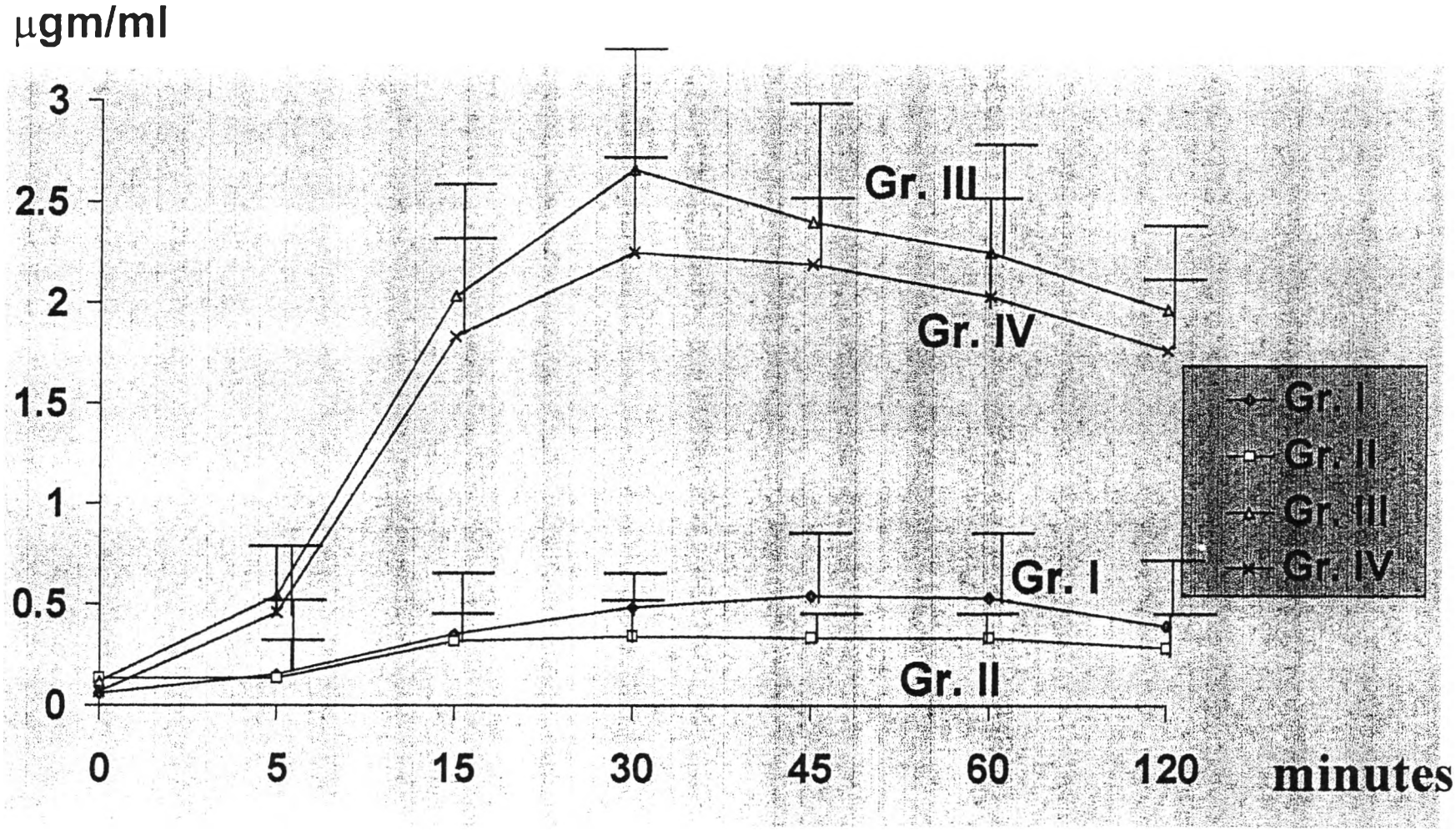


Figure 6.5 This figure shows the (mean,SD) plasma lidocaine levels at time 0,5,15,30,45,60,and 120 minutes after the lidocaine instillation. Plasma lidocaine levels in the groups with lidocaine (III,IV) were significantly higher than in the groups without lidocaine (I,II) ($p < 0.001$).