

RESULTS

The present study was carried out on 40 adult patients admitted to Alexandria main university hospitals of either sex ASA class I or II aged 18-45 years scheduled for elective superficial surgeries under general anesthesia with endotracheal intubation.

Patients were randomly categorized into two equal groups (20 each).

The results of the present study showed:

Demographic data:

In group I: It included 20 patients 13 males and 7 females their ages ranged between 18-45 years with a mean value of 30.95 ± 8.38 . (**Tables 3,4**)

In group II: It included 20 patients 12 males and 8 females their ages ranged between 18-45 years with mean value of 30.85 ± 8.51 . (**Tables 3,4**)

Comparison between the two groups regarding sex through Chi square test showed no statistically significant difference between them. (**Table 3**)

Comparison between the two groups regarding age through student t-test showed no statistically significant difference between them. (**Table 4**)

This indicate that the fore mentioned variables would have least influence on the assessed parameters when compairing the effect of pregabalin and clonidine on haemodynamic response to tracheal intubation.

Table (3): Comparison between the two studied groups according to sex

	Sex	
	Pregabalin	Clonidine
1	Male	Male
2	Male	Male
3	Male	Male
4	Female	Female
5	Male	Female
6	Female	Male
7	Male	Female
8	Female	Male
9	Female	Male
10	Male	Female
11	Male	Female
12	Female	Male
13	Male	Male
14	Male	Male
15	Male	Female
16	Female	Male
17	Male	Female
18	Male	Male
19	Male	Female
20	Female	Male
Male	13 (65.0%)	12 (60.0%)
Female	7 (35.0%)	8 (40.0%)
χ^2	0.107	
p	0.744	

χ^2 : Chi square test

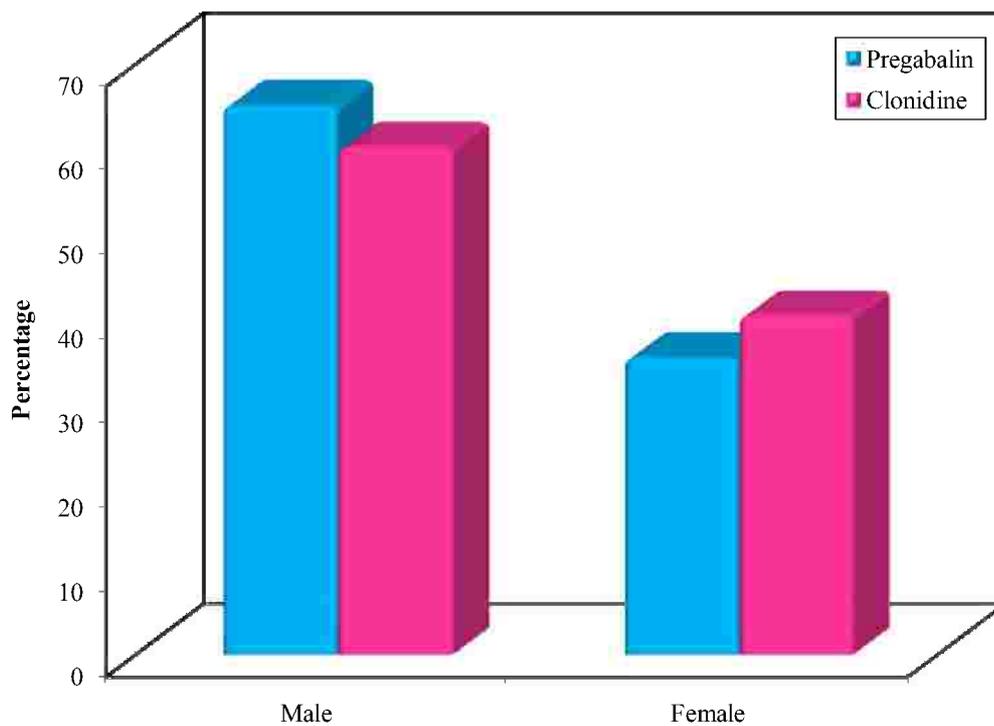


Figure (3): Comparison between the two studied groups according to sex

Table (4): Comparison between the two studied groups according to age

	Age	
	Pregabalin	Clonidine
1	28	20
2	38	33
3	26	26
4	38	44
5	28	21
6	33	19
7	39	40
8	34	38
9	44	37
10	22	32
11	19	41
12	39	27
13	43	35
14	25	27
15	20	18
16	22	45
17	41	35
18	33	31
19	29	27
20	18	21
Min.	18.0	18.0
Max.	44.0	45.0
Mean	30.95	30.85
SD.	8.38	8.51
t	0.037	
p	0.970	

t: Student t-test

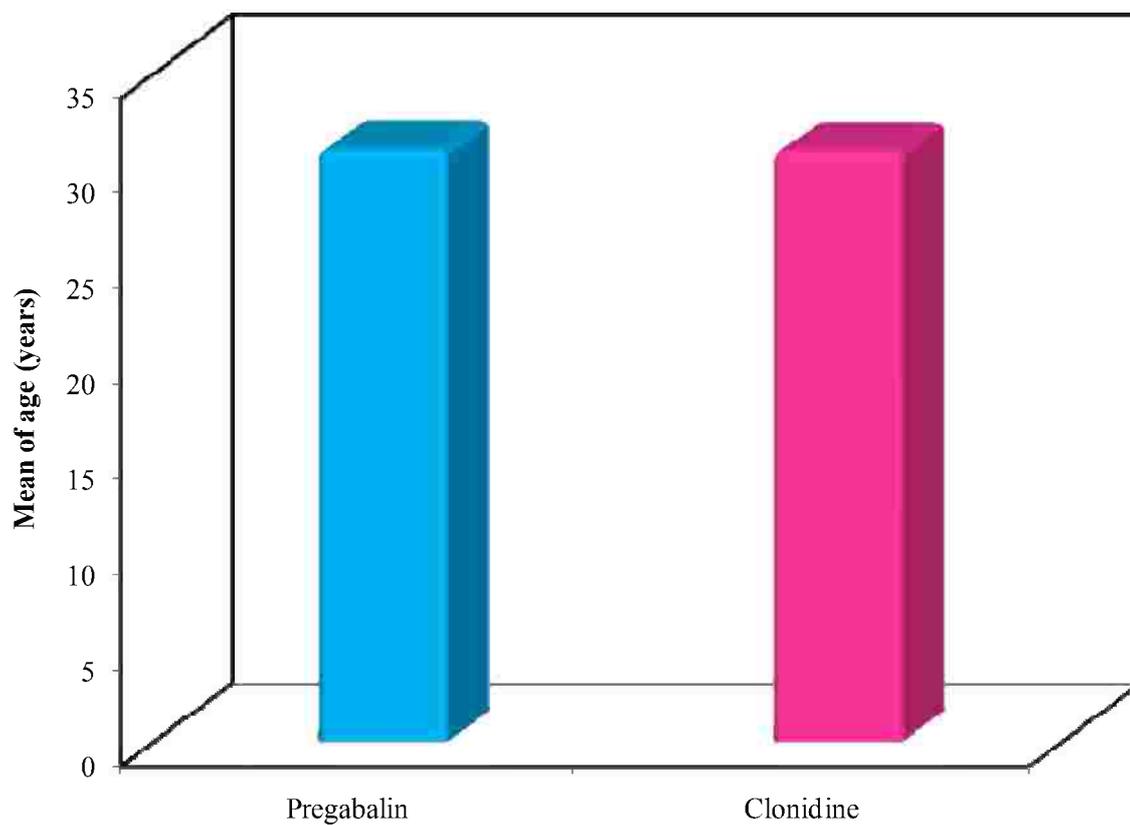


Figure (4): Comparison between the two studied groups according to age

Changes in heart rate: (Tables 5, 6, 7)

Heart rate was recorded before premedication, before induction, after induction, after intubation immediately, 2 minute interval until 10 minutes after intubation then at 15 minutes interval till the end of surgery, and 10 minute after extubation.

This was done for all patient of the two groups.

Group I: (Table 5)

Before premedication the value of heart rate ranged from minimum 65 beat per minute and maximum 95 beat per minute with a mean of 81.05

Pre-induction the value of heart rate ranged from 62 b/min and 93 b/min with mean 77.

After induction heart rate changed significantly into 61 b/min and 89 b/min with mean value 74.3b/min.

After intubation:

At 0 minute heart rate changed significantly into 62 b/min and 90 b/min with mean value 75.7b/min

At 2 the heart rate changed significantly into 63 b/min and 91 b/min with mean value 77.5

At 4 minute heart rate changed significantly into 60 b/min and 90 b/min with mean value 75.6 b/min.

At 6 minute heart rate changed significantly into 61 b/min and 88 b/min with mean value 75.15 b/min.

At 8 minute heart rate changed significantly into 62 b/min and 89 b/min with mean value 74.65 b/min.

At 10 minute heart rate changed significantly into 60 b/min and 90 b/min with mean value 75.05 b/min.

At 25 minutes heart rate changed significantly into 60 b/min and 88 b/min with mean value 75 b/min.

At 40 minutes heart rate changed significantly into 60 b/min and 90 b/min with mean value 76.1 b/min.

At 55 minute no significant changes of HR which ranged between 69 b/min and 84 b/min with mean value 75.4 b/min.

At 10 minutes after extubation heart rate changed significantly into 62 b/min and 92 b/min with mean value 76.3 b/min.

Group II: (Table 6)

Before premedication the value of heart rate ranged from minimum 65 beat per minute and maximum 95 beat per minute with a mean of 81.75

Pre-induction the value of heart rate ranged from 60 b/min and 87 b/min with mean 72.35

After induction heart rate changed significantly into 55 b/min and 85 b/min with mean value 68.15b/min.

After intubation:

At 0 minute heart rate changed significantly into 57 b/min and 85 b/min with mean value 69.6b/min

At 2 minute the heart rate changed significantly into 57b/min and 87b/min with mean value 71.1

At 4 minute heart rate changed significantly into 55b/min and 87b/min with mean value 68.8b/min.

At 6 minute heart rate changed significantly into 54b/min and 85b/min with mean value 68.9b/min.

At 8 minute heart rate changed significantly into 57b/min and 82b/min with mean value 68.5b/min.

At 10 minute heart rate changed significantly into 55b/min and 83b/min with mean value 68.2b/min.

At 25 minutes heart rate changed significantly into 56b/min and 84b/min with mean value 68.6b/min.

At 40 minutes heart rate changed significantly into 59b/min and 85b/min with mean value 70.1b/min.

At 55 minutes no significant changes of HR which ranged between 55b/min and 75b/min with mean value 65.7b/min.

At 10 minutes after extubation heart rate changed significantly into 58b/min and 84b/min with mean value 69.8b/min.

Comparison between the two groups in the heart rate: (Table 7)

The heart rate was statistically significant higher in group I than in group II through all measurement from after induction till 10 minutes after extubation.

Table (5): Distribution of the studied cases according to HR in pregabalin group

	Before premedication	Pre induction	After induction	After intubation									10 min After extubation
				0 min	2 min	4 min	6 min	8 min	10 min	25 min	40 min	55 min	
1	90	87	83	83	87	83	82	80	84	84	83		82
2	80	75	71	70	74	70	69	71	73	73	75	71	73
3	70	67	63	63	66	63	62	64	63	66	64		63
4	80	79	75	72	78	73	74	72	75	72	73		72
5	95	87	83	83	88	85	84	83	86	83	83		81
6	87	87	81	84	87	87	82	84	84	80	83		82
7	89	85	81	81	82	81	82	85	80	78	80	73	80
8	75	72	68	73	72	73	71	73	71	73	70		70
9	65	64	61	64	63	63	64	63	61	64	62		64
10	88	84	81	84	84	81	80	82	80	80	80		83
11	93	89	86	85	89	85	82	81	84	83	85	80	88
12	90	88	86	86	87	86	87	84	84	87	82	84	87
13	72	72	68	68	72	70	71	67	68	72	68		75
14	65	62	59	63	63	63	64	62	64	66	63		64
15	89	82	78	79	82	80	78	76	78	78	81		86
16	83	82	79	78	81	79	77	79	82	80	79		82
17	77	75	71	72	74	71	69	72	70	70	69	69	73
18	69	66	63	63	65	64	62	65	63	63	65		65
19	86	82	77	80	82	80	77	75	77	76	79		77
20	78	77	74	76	79	77	75	74	72	76	73		75
Min.	65.0	62.0	61.0	62.0	63.0	60.0	61.0	62.0	60.0	60.0	60.0	69.0	62.0
Max.	95.0	93.0	89.0	90.0	91.0	90.0	88.0	89.0	90.0	88.0	90.0	84.0	92.0
Mean	81.05	77.10	74.30	75.70	77.50	75.60	75.15	74.65	75.05	75.0	76.10	75.40	76.30
SD.	±9.36	±9.52	±8.90	±8.63	±8.65	±9.20	±9.34	±9.15	±9.43	±9.34	±9.38	±6.35	±9.39
P		<0.001*	<0.001*	<0.001*	<0.001*	<0.001*	<0.001*	<0.001*	<0.001*	<0.001*	<0.001*	0.005*	0.001*

p₁: Stands for adjusted Bonferroni p-value for ANOVA with repeated measures for comparison between Before premedication with each other period

*: Statistically significant at $p \leq 0.05$

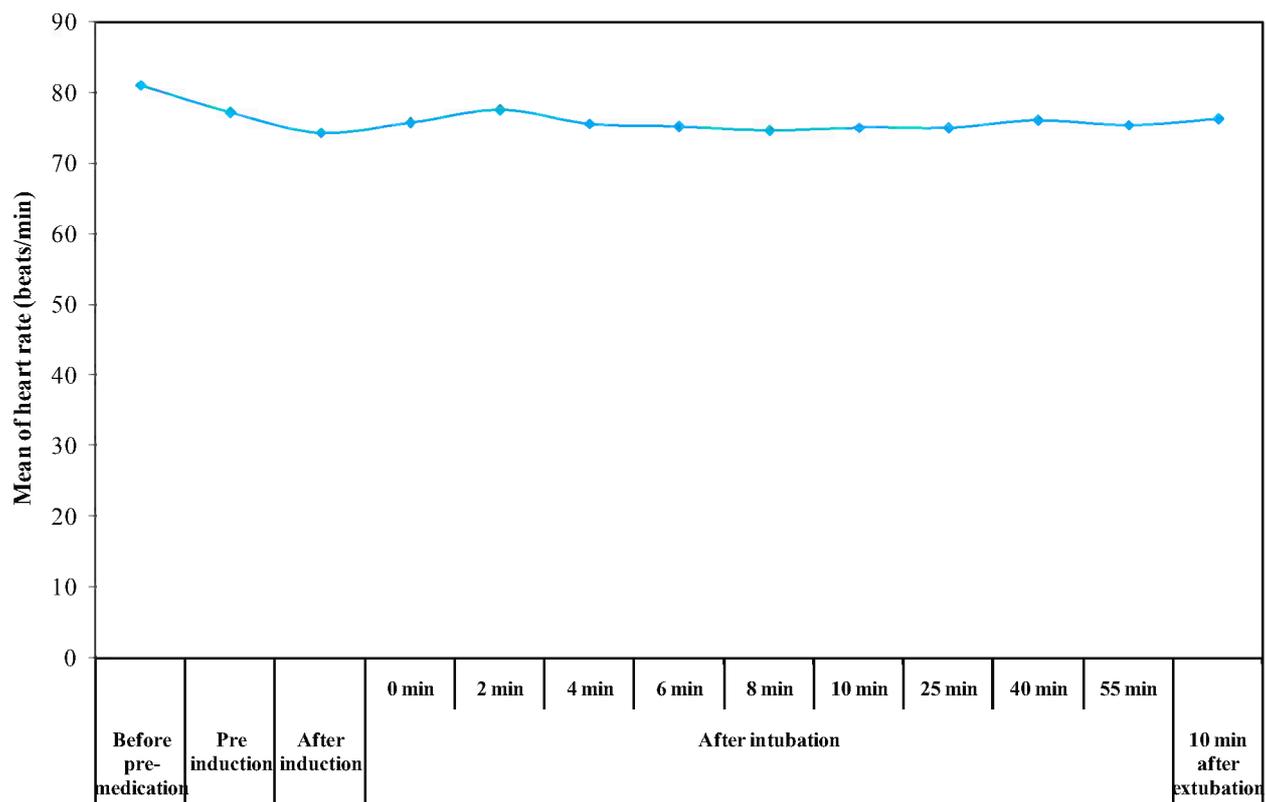


Figure (5): Distribution of the studied cases according to HR in pregabalin group

Table (6): Distribution of the studied cases according to HR in clonidine group

	Before premedication	Pre induction	After induction	After intubation									10 min after extubation
				0 min	2 min	4 min	6 min	8 min	10 min	25 min	40 min	55 min	
1	90	80	75	77	81	77	75	77	76	75	77	75	80
2	93	80	73	75	74	74	73	74	75	73	74		77
3	80	73	69	70	71	72	70	70	69	71	69	70	71
4	95	83	76	78	78	78	76	76	77	79	78		83
5	77	65	61	63	66	60	63	60	59	62	61		65
6	80	73	65	69	68	68	67	69	68	69	67		70
7	70	65	60	63	66	64	63	63	58	59	60	63	65
8	87	74	70	71	75	71	70	70	72	74	73		70
9	83	75	69	71	71	71	69	71	70	74	70		74
10	89	80	75	76	74	74	74	75	78	75	77		75
11	65	60	56	58	61	57	56	58	55	57	55	55	58
12	72	67	62	63	68	64	63	64	65	64	63		63
13	90	82	78	79	80	80	79	77	81	78	79		81
14	89	83	77	78	81	79	77	76	78	76	80		76
15	75	69	67	66	71	68	67	66	67	65	65		66
16	69	62	59	61	63	62	59	61	58	59	62		58
17	78	70	67	69	70	69	67	68	68	69	67		67
18	88	80	75	77	77	77	77	78	76	75	75		79
19	86	81	76	78	79	80	78	76	79	79	76		77
20	79	70	63	64	67	65	64	63	66	65	63		64
Min.	65.0	60.0	55.0	57.0	57.0	55.0	54.0	57.0	55.0	56.0	59.0	55.0	58.0
Max.	95.0	87.0	85.0	85.0	87.0	87.0	85.0	82.0	83.0	84.0	85.0	75.0	84.0
Mean	81.75	72.35	68.15	69.60	71.10	68.80	68.90	68.50	68.20	68.60	70.10	65.75	69.80
SD.	±8.59	±9.45	±9.69	±9.47	±9.43	±9.23	±9.62	±8.27	±9.01	±9.02	±9.11	±8.69	±9.27
P		<0.001*	<0.001*	<0.001*	<0.001*	<0.001*	<0.001*	<0.001*	<0.001*	<0.001*	<0.001*	0.008*	<0.001*

p₁: Stands for adjusted Bonferroni p-value for ANOVA with repeated measures for comparison between Before premedication with each other period

*: Statistically significant at $p \leq 0.05$

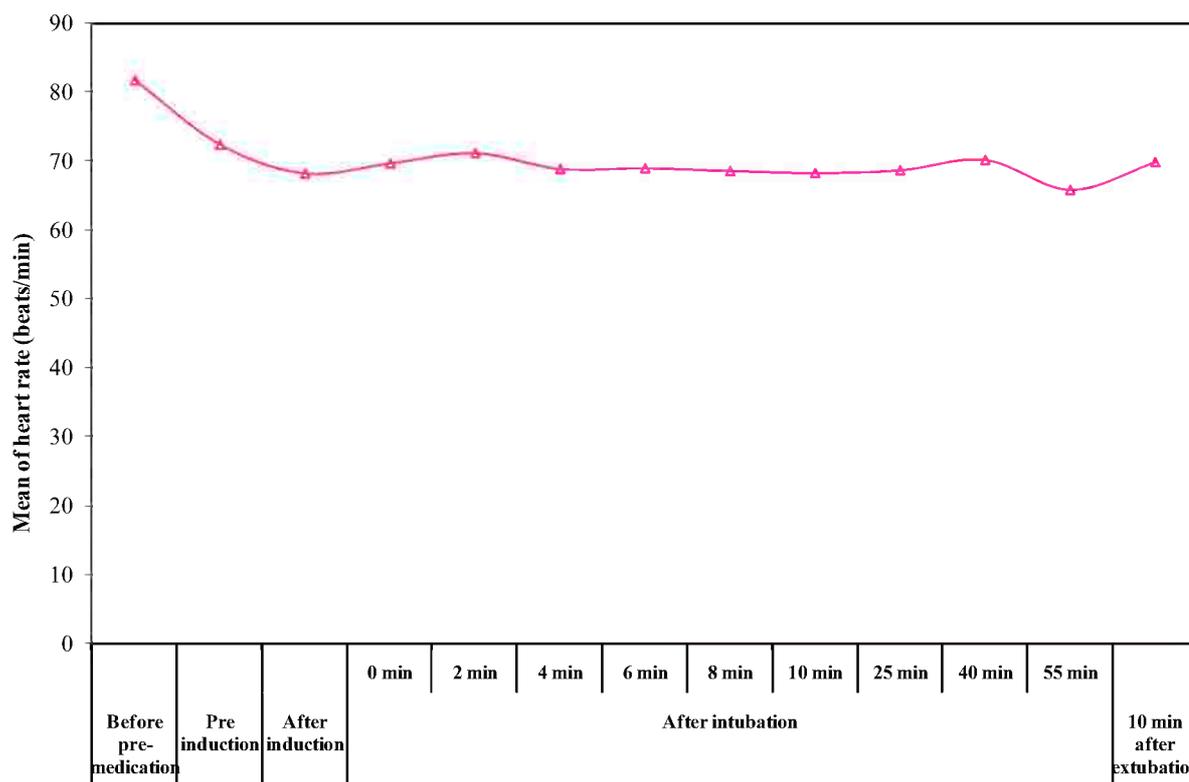


Figure (6): Distribution of the studied cases according to HR in clonidine group

Table (7): Comparison between the two studied groups according to HR

	Before premedication	Pre induction	After induction	After intubation									10 min after extubation
				0 min	2 min	4 min	6 min	8 min	10 min	25 min	40 min	55 min	
Pregabalin													
Min.	65.0	62.0	61.0	62.0	63.0	60.0	61.0	62.0	60.0	60.0	60.0	69.0	62.0
Max.	95.0	93.0	89.0	90.0	91.0	90.0	88.0	89.0	90.0	88.0	90.0	84.0	92.0
Mean	81.05	77.10	74.30	75.70	77.50	75.60	75.15	74.65	75.05	75.0	76.10	75.40	76.30
SD.	9.36	9.52	8.90	8.63	8.65	9.20	9.34	9.15	9.43	9.34	9.38	6.35	9.39
Clonidine													
Min.	65.0	60.0	55.0	57.0	57.0	55.0	54.0	57.0	55.0	56.0	59.0	55.0	58.0
Max.	95.0	87.0	85.0	85.0	87.0	87.0	85.0	82.0	83.0	84.0	85.0	75.0	84.0
Mean	81.75	72.35	68.15	69.60	71.10	68.80	68.90	68.50	68.20	68.60	70.10	65.75	69.80
SD.	±8.59	±9.45	±9.69	±9.47	±9.43	±9.23	±9.62	±8.27	±9.01	±9.02	±9.11	±8.69	±9.27
T	0.246	1.779	2.358*	2.147*	2.416*	2.160*	2.292*	2.251*	2.053*	2.391*	2.229*	1.932	2.098*
P	0.807	0.083	0.024*	0.038*	0.021*	0.037*	0.028*	0.030*	0.047*	0.022*	0.032*	0.095	0.043*

t: Student t-test

*: Statistically significant at $p \leq 0.05$

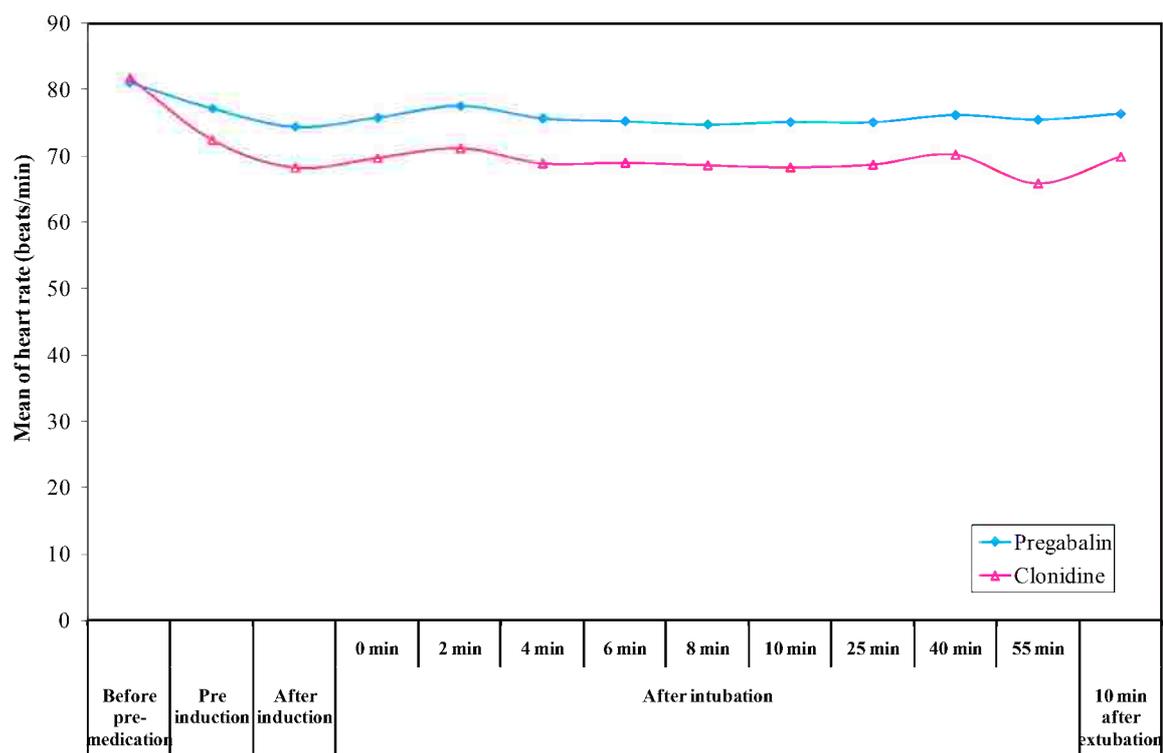


Figure (7): Comparison between the two studied groups according to HR

Results

Changes in mean arterial blood pressure: (Tables 8, 9, 10)

Group I: (Table 8)

Before premedication the value of MABP ranged from min 65 and max 105 with mean value of 84.55

Pre-induction the value of MABP ranged from 62 and 93 with mean value 77.1

After induction the value of MABP changed significantly with a decrease into 61 and 89 with mean value 74.3

After intubation:

At 0 minute the value of MABP changed significantly with a decrease into 62 and 90 with mean value 75.7

At 2 minute mean arterial blood pressure changed significantly into 63 and 91 with mean value 77.5

At 4 minute the value of MABP changed significantly with a decrease into 60 and 90 with mean value 75.6

At 6 minute the value of MABP changed significantly with a decrease into 61 and 88 with mean value 75.15

At 8 minute the value of MABP changed significantly with a decrease into 62 and 89 with mean value 74.65

At 10 minute the value of MABP changed significantly with a decrease into 60 and 90 with mean value 75.05

At 25 minute the value of MABP changed significantly with a decrease into 60 and 88 with mean value 75

At 40 minute the value of MABP changed significantly with a decrease into 60 and 90 with mean value 76.1

At 55 minute no significant changes of MABP which ranged between 72 and 85 with mean value 77.4

At 10 min after extubation the value of MABP changed significantly with a decrease into 62 and 92 with mean value 76.3

Group II: (Table 9)

Before premedication the value of MABP ranged from min 65 and max 105 with mean value of 84.2

Pre-induction the value of MABP ranged from 60 and 87 with mean value 72.35

After induction the value of MABP changed significantly with a decrease into 55 and 85 with mean value 68.15

Results

After intubation:

At 0 minute the value of MABP changed significantly with a decrease into 57 and 85 with mean value 69.6

At 2 minute the mean arterial blood pressure changed significantly into 57 and 87 with mean value 71.1

At 4 minute the value of MABP changed significantly with a decrease into 55 and 87 with mean value 68.8

At 6 minute the value of MABP changed significantly with a decrease into 54 and 85 with mean value 68.9

At 8 minute the value of MABP changed significantly with a decrease into 57 and 82 with mean value 68.5

At 10 minute the value of MABP changed significantly with a decrease into 55 and 83 with mean value 68.2

At 25 minute the value of MABP changed significantly with a decrease into 56 and 84 with mean value 68.6

At 40 minute the value of MABP changed significantly with a decrease into 59 and 85 with mean value 70.1

At 55 minute no significant changes of MABP which ranged between 55 and 82 with mean value 71.0

At 10 min after extubation the value of MABP changed significantly with a decrease into 58 and 84 with mean value 69.8

Comparison between the two groups in MABP: (Table 10)

The MABP was statistically significant higher in group I than in group II through all measurement from after induction till 10 minutes after extubation.

Table (8): Distribution of the studied cases according to MABP in pregabalin group

	Before premedication	Pre induction	After induction	After intubation									10 min after extubation
				0 min	2 min	4 min	6 min	8 min	10 min	25 min	40 min	55 min	
1	93	85	81	83	85	84	85	84	83	84	84		84
2	96	87	84	85	87	85	85	83	85	86	86	85	86
3	83	75	71	74	75	73	72	74	73	73	75		73
4	101	90	86	88	91	89	87	87	88	87	89		90
5	75	69	66	69	71	68	69	69	67	71	69		68
6	65	63	61	62	63	62	61	62	61	62	62		62
7	80	75	73	75	77	74	73	70	73	73	74	73	74
8	82	75	74	73	75	73	71	68	73	71	74		74
9	72	68	66	69	70	67	63	66	66	63	67		68
10	97	85	81	83	84	83	84	85	83	85	84		84
11	86	77	75	76	79	75	75	76	75	75	76	76	76
12	81	76	74	73	76	74	72	73	74	72	75	72	75
13	74	65	63	65	66	66	62	64	63	65	64		64
14	82	75	71	72	74	74	76	73	73	75	75		75
15	95	85	83	83	85	83	82	82	83	83	84		84
16	105	90	86	88	88	88	88	86	88	88	89		89
17	89	80	77	76	79	79	81	78	78	77	79	81	79
18	65	62	61	63	65	60	63	62	60	60	60		63
19	70	67	64	67	69	65	66	62	65	63	66		66
20	100	93	89	90	91	90	88	89	90	87	90		92
Min.	65.0	62.0	61.0	62.0	63.0	60.0	61.0	62.0	60.0	60.0	60.0	72.0	62.0
Max.	105.0	93.0	89.0	90.0	91.0	90.0	88.0	89.0	90.0	88.0	90.0	85.0	92.0
Mean	84.55	77.10	74.30	75.70	77.50	75.60	75.15	74.65	75.05	75.0	76.10	77.40	76.30
SD.	±12.14	±9.52	±8.90	±8.63	±8.65	±9.20	±9.34	±9.15	±9.43	±9.34	±9.38	±5.50	±9.39
P		<0.001*	<0.001*	<0.001*	<0.001*	<0.001*	<0.001*	<0.001*	<0.001*	<0.001*	<0.001*	<0.001*	<0.001*

p₁: Stands for adjusted Bonferroni p-value for ANOVA with repeated measures for comparison between Before premedication with each other period

*: Statistically significant at $p \leq 0.05$

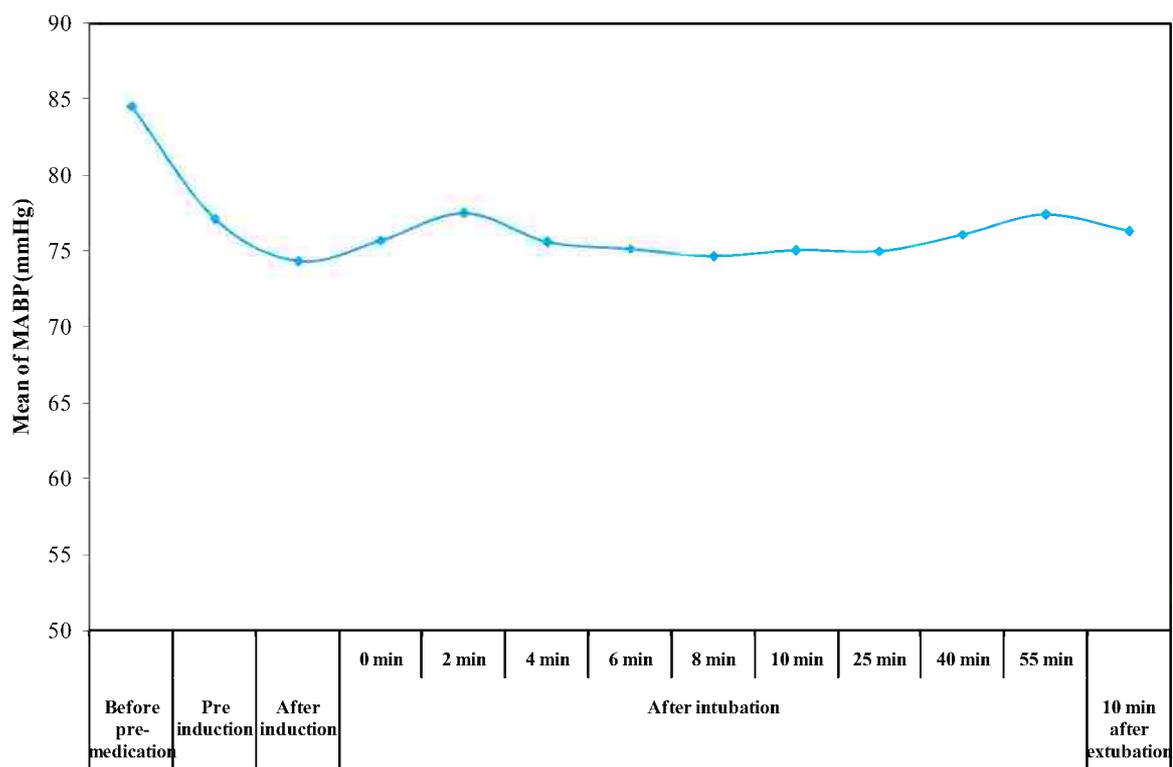


Figure (8): Distribution of the studied cases according to MABP in pregabalin group

Table (9): Distribution of the studied cases according to MABP in clonidine group

	Before premedication	Pre induction	After induction	After intubation									10 min after extubation
				0 min	2 min	4 min	6 min	8 min	10 min	25 min	40 min	55 min	
1	100	87	85	85	87	87	85	80	80	84	82	80	84
2	70	65	60	62	65	62	63	60	62	62	63		63
3	65	60	57	59	60	59	57	57	55	57	59	55	58
4	93	85	83	83	85	83	83	80	83	80	85		83
5	96	80	75	77	78	75	75	74	76	76	78		76
6	83	70	65	65	67	69	67	65	65	67	65		68
7	82	70	65	68	70	65	67	69	67	65	68	67	68
8	80	68	64	66	68	64	65	66	66	63	66		66
9	65	60	55	57	57	55	54	58	55	56	59		58
10	75	65	59	60	65	63	60	62	60	62	60		63
11	101	85	82	83	85	80	83	82	82	80	85	82	83
12	97	80	75	77	77	74	73	73	76	74	77		76
13	86	70	66	66	68	65	65	67	66	68	66		67
14	81	70	64	66	67	65	64	64	65	68	66		67
15	74	60	57	57	58	57	56	59	59	57	60		58
16	105	85	80	82	83	80	82	80	79	80	82		83
17	95	85	80	81	82	80	80	78	78	82	81		82
18	82	70	65	70	70	67	69	69	65	66	68		68
19	89	70	66	66	67	64	68	68	65	65	67		66
20	65	62	60	62	63	62	62	59	60	60	65		59
Min.	65.0	60.0	55.0	57.0	57.0	55.0	54.0	57.0	55.0	56.0	59.0	55.0	58.0
Max.	105.0	87.0	85.0	85.0	87.0	87.0	85.0	82.0	83.0	84.0	85.0	82.0	84.0
Mean	84.20	72.35	68.15	69.60	71.10	68.80	68.90	68.50	68.20	68.60	70.10	71.0	69.80
SD.	±12.61	±9.45	±9.69	±9.47	±9.43	±9.23	±9.62	±8.27	±9.01	±9.02	±9.11	±12.57	±9.27
P		<0.001*	<0.001*	<0.001*	<0.001*	<0.001*	<0.001*	<0.001*	<0.001*	<0.001*	<0.001*	0.006*	<0.001*

p₁: Stands for adjusted Bonferroni p-value for ANOVA with repeated measures for comparison between Before premedication with each other period

*: Statistically significant at $p \leq 0.05$

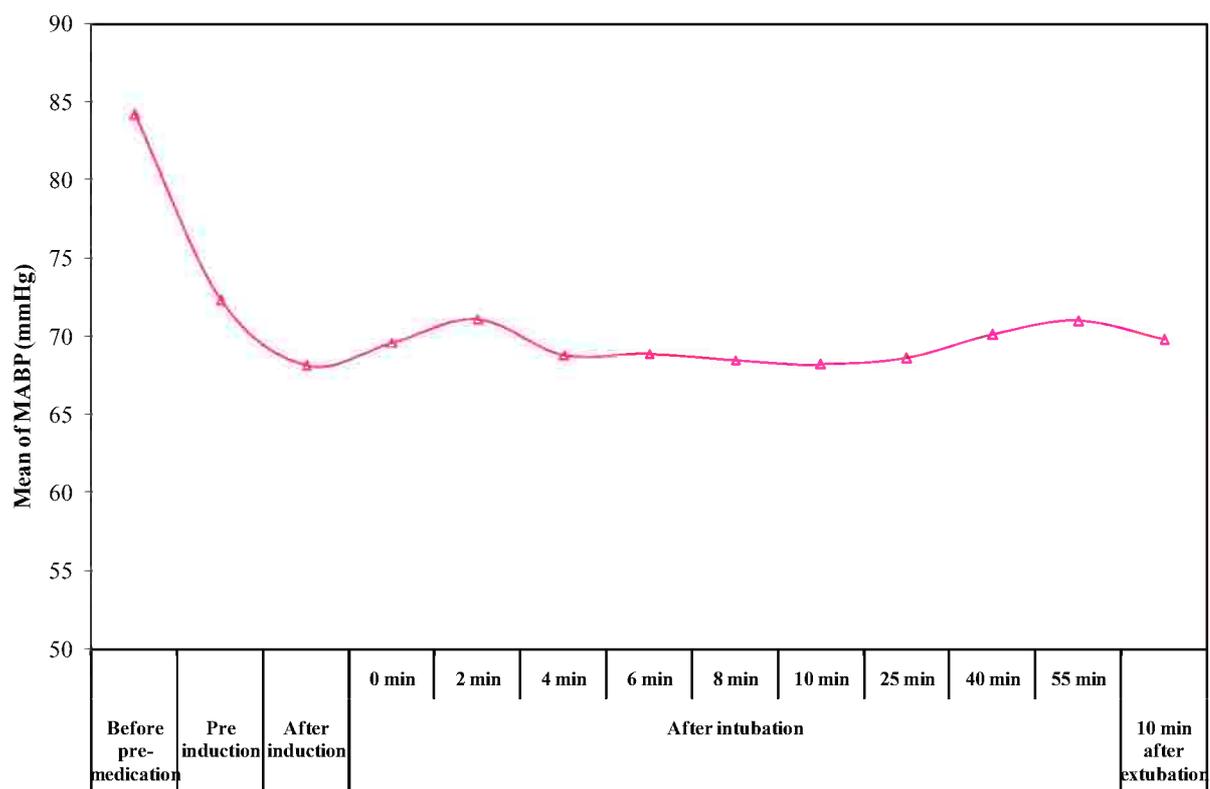


Figure (9): Distribution of the studied cases according to MABP in clonidine group

Table (10): Comparison between the two studied groups according to MABP

	Before premedication	Pre induction	After induction	After intubation									10 min after extubation
				0 min	2 min	4 min	6 min	8 min	10 min	25 min	40 min	55 min	
Pregabalin													
Min.	65.0	62.0	61.0	62.0	63.0	60.0	61.0	62.0	60.0	60.0	60.0	72.0	62.0
Max.	105.0	93.0	89.0	90.0	91.0	90.0	88.0	89.0	90.0	88.0	90.0	85.0	92.0
Mean	84.55	77.10	74.30	75.70	77.50	75.60	75.15	74.65	75.05	75.0	76.10	77.40	76.30
SD.	12.14	9.52	8.90	8.63	8.65	9.20	9.34	9.15	9.43	9.34	9.38	5.50	9.39
Clonidine													
Min.	65.0	60.0	55.0	57.0	57.0	55.0	54.0	57.0	55.0	56.0	59.0	55.0	58.0
Max.	105.0	87.0	85.0	85.0	87.0	87.0	85.0	82.0	83.0	84.0	85.0	82.0	84.0
Mean	84.20	72.35	68.15	69.60	71.10	68.80	68.90	68.50	68.20	68.60	70.10	71.0	69.80
SD.	±12.61	±9.45	±9.69	±9.47	±9.43	±9.23	±9.62	±8.27	±9.01	±9.02	±9.11	±12.57	±9.27
T	0.089	1.584	2.091*	2.130*	2.238*	2.334*	2.084*	2.230*	2.349*	2.204*	2.052*	1.035	2.203*
P	0.929	0.122	0.043*	0.040*	0.031*	0.025*	0.044*	0.032*	0.024*	0.034*	0.047*	0.335	0.034*

t: Student t-test

*: Statistically significant at $p \leq 0.05$

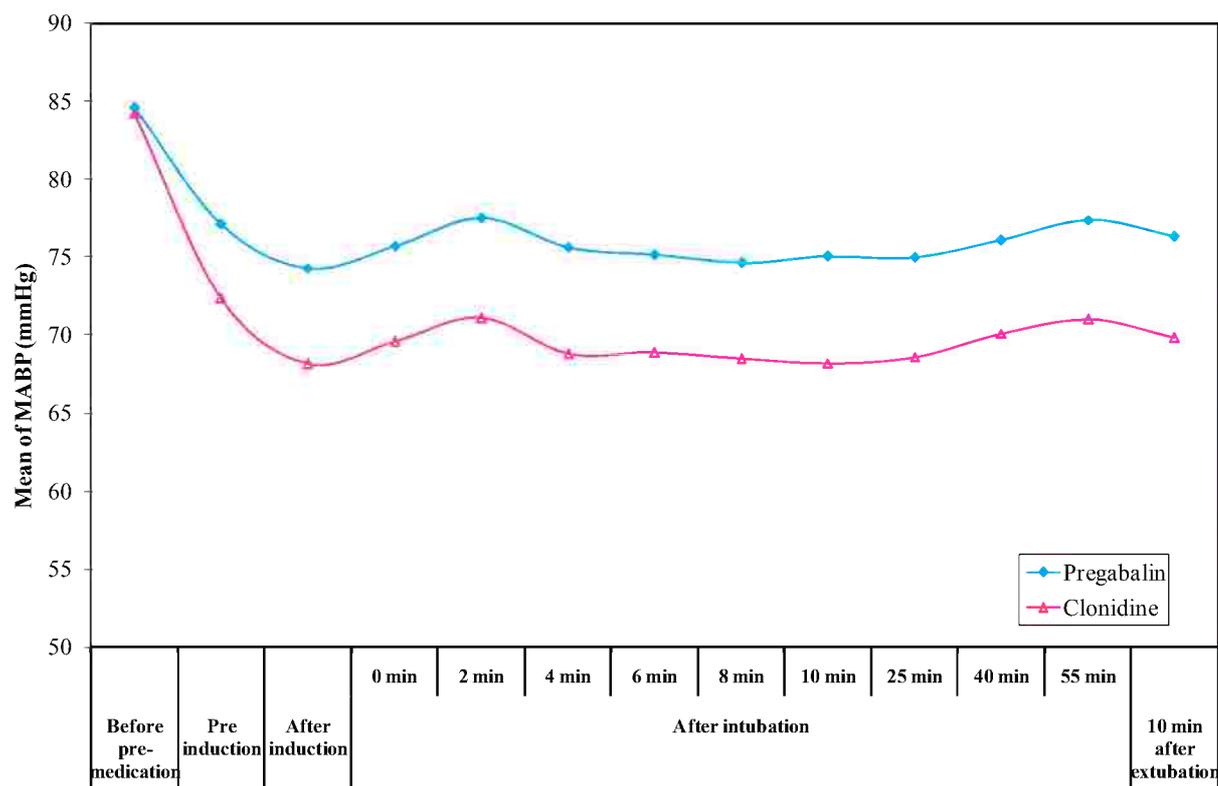


Figure (10): Comparison between the two studied groups according to MABP

Results

Visual analogue scale for anxiety and sedation: (Tables 11-13)

Both pregabalin and clonidine showed significant level of sedation. (Table 11,12) but there was higher significant difference in the level of sedation and anxiolysis in group I compared to group II. (Table 13)

Table (11): Level of sedation in group I Pregabalin

	level of sedation	
	Before pregabalin	Preoperative
1	4	0
2	2	0
3	6	2
4	2	0
5	6	2
6	4	2
7	2	2
8	4	0
9	2	0
10	6	2
11	4	0
12	4	2
13	2	2
14	2	0
15	2	0
16	4	2
17	6	4
18	6	4
19	4	2
20	2	0
Min.	2.0	0.0
Max.	6.0	4.0
Mean	3.70	1.30
SD.	±1.63	±1.34
Median	4.0	2.0
Z	3.874*	
p	<0.001*	

Z: Z for Wilcoxon signed ranks test

*: Statistically significant at $p \leq 0.05$

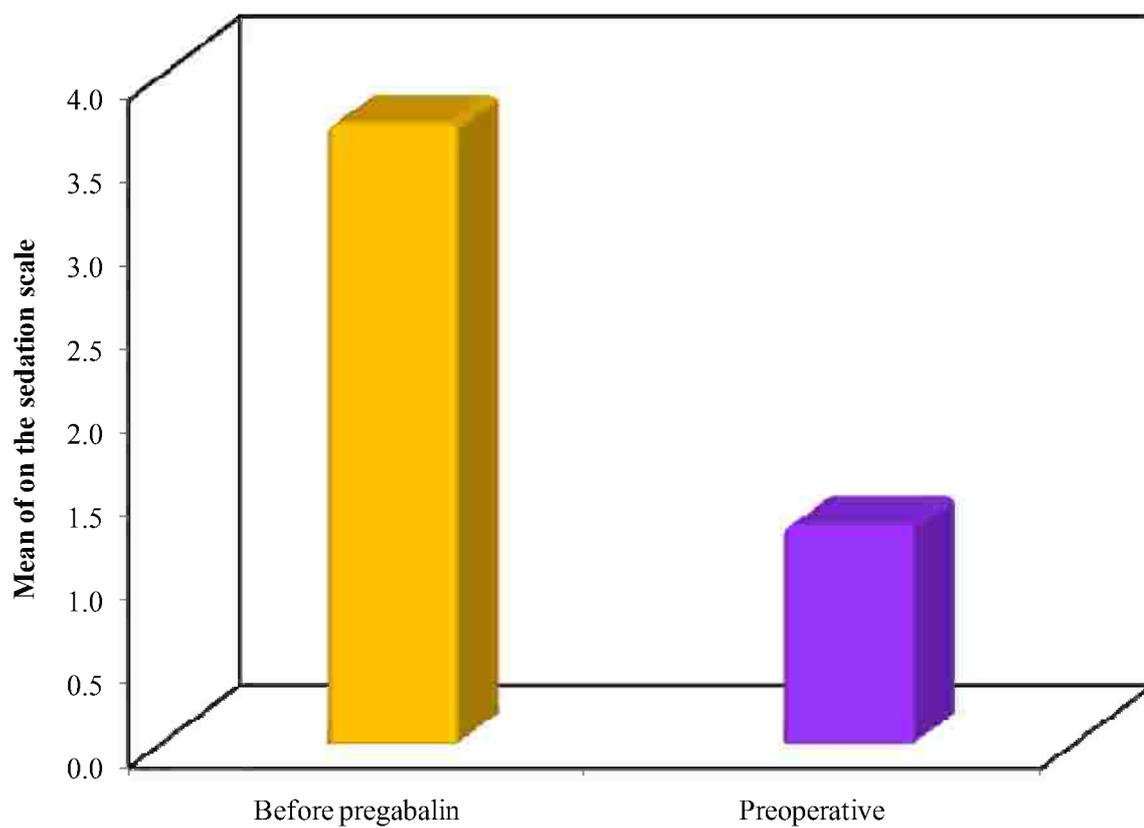


Figure (11): Level of sedation in group I Pregabalin

Table (12): Level of sedation in group II Clonidine

	Clonidine	
	Before clonidine	Preoperative
1	4	2
2	4	2
3	6	4
4	6	4
5	2	0
6	2	0
7	6	4
8	2	0
9	4	2
10	2	2
11	2	2
12	6	4
13	6	4
14	6	4
15	2	0
16	2	0
17	4	2
18	6	4
19	2	2
20	6	4
Min.	2.0	0.0
Max.	6.0	4.0
Mean	4.0	2.30
SD.	±1.84	±1.63
Median	4.0	2.0
Z	4.123*	
p	<0.001*	

Z: Z for Wilcoxon signed ranks test
 *: Statistically significant at $p \leq 0.05$

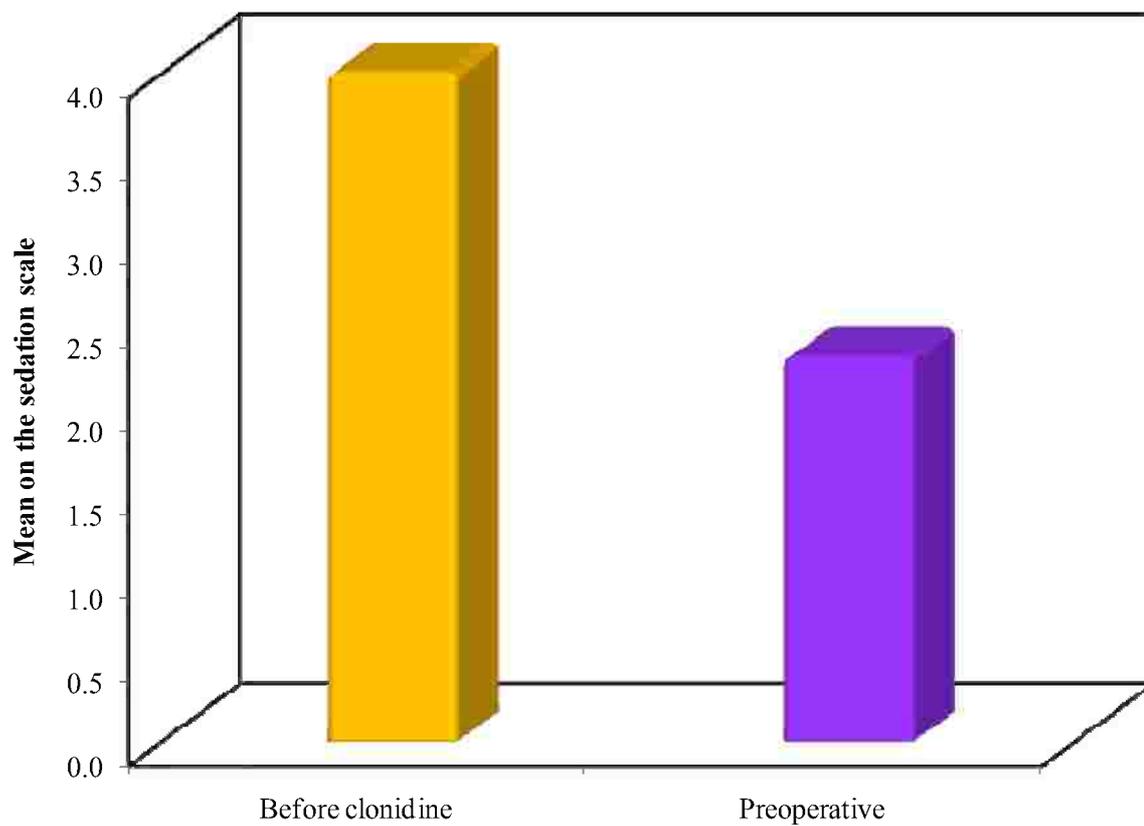


Figure (12): Level of sedation in group II Clonidine

Table (13): Comparison between the two studied groups according to level of sedation

	Level of sedation	
	Pregabalin	Clonidine
1	0	2
2	0	2
3	2	4
4	0	4
5	2	0
6	2	0
7	2	4
8	0	0
9	0	2
10	2	2
11	0	2
12	2	4
13	2	4
14	0	4
15	0	0
16	2	0
17	4	2
18	4	4
19	2	2
20	0	4
Min.	0.0	0.0
Max.	4.0	4.0
Mean	1.30	2.30
SD.	±1.34	±1.63
Median	2.0	2.0
Z	1.992*	
p	0.046*	

Z: Z for Mann Whitney test

*: Statistically significant at $p \leq 0.05$

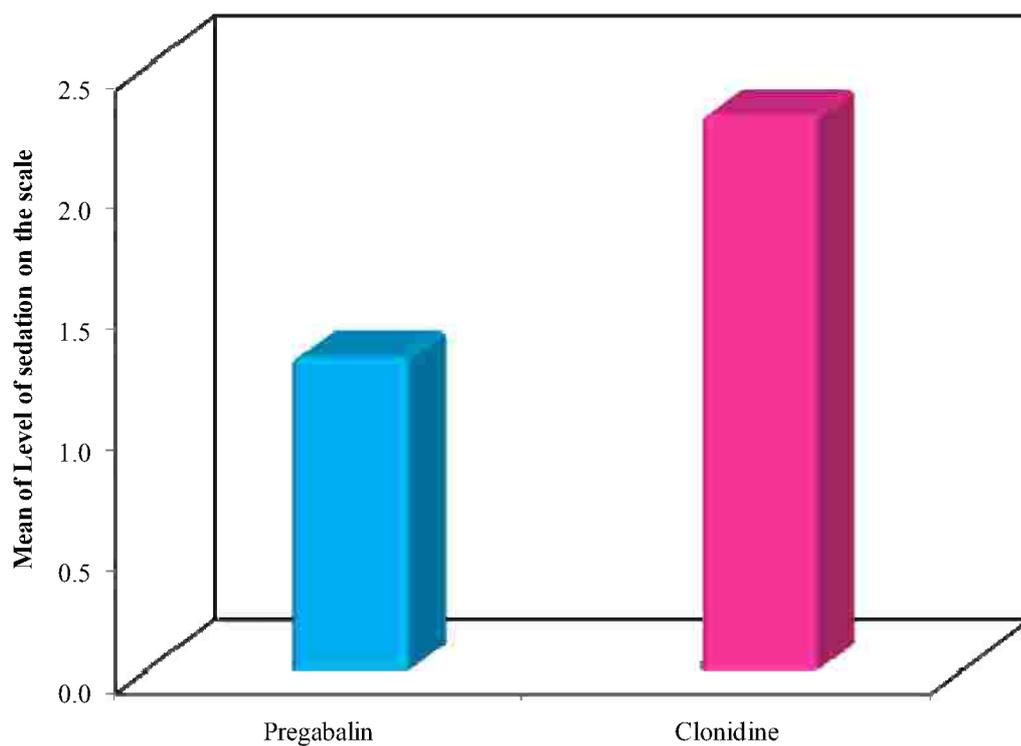


Figure (13): Comparison between the two studied groups according to level of sedation