

PERIOPERATIVE BETA BLOCKER IN HIGH RISK PATIENTS UNDERGOING MAJOR ABDOMINAL SURGERY AND ITS EFFECT ON CARDIOVASCULAR MORTALITY AND MORBIDITY

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ABSTRACT

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Background: Perioperative cardiac complications are an important concern for the millions of individuals who undergo surgery worldwide every year. After surgery, 2% of these patients suffer major cardiac complications.

Aim of the Work: To study the effects of perioperatively administered beta-blockers for prevention of surgery-related mortality and morbidity in patients undergoing major abdominal surgery while under general anesthesia.

Patients and Methods: This is an observational prospective study, in which 240 patients were divided into 2 groups (120 patients each) as follows: Beta blocker group (BB group) 120 patients on beta blocker (Bisoprolol 5 mg) started more than 15 days preoperative and continued for at least 7 days postoperative. Control group: 120 patients not receiving any beta blocker.

Results: In this study, results showed no difference between 2 groups regarding cerebrovascular events and heart failure. Equal cases of mortality happened to patients in both groups. As regards hypotension with SBP<90 mmHg, we found that it occurred to 32 patients representing 26.7 % of beta blocker group, compared to 18 patients representing 15 % of the control group.

Conclusion: Analysis of the results concluded that Patients on beta blocker are at less risk of perioperative arrhythmias and myocardial infarction when undergoing high risk surgeries. These patients are at higher risk of experiencing episodes of bradycardia and hypotension. No significant effect on perioperative heart failure, cerebrovascular stroke and mortality.

Keywords: Ischemic heart disease, Beta blocker, Peri Operative ISchemic Evaluation

INTRODUCTION:

Worldwide it is estimated that around 200 million people undergo non-cardiac surgery annually. Cardiovascular complications account for majority of the cause of postoperative morbidity and mortality with incidence ranging from 0.5% to 30%⁽¹⁾.

Non-cardiac surgery causes a rise in catecholamine concentrations that results in

an increase in heart rate, blood pressure, and free fatty acid concentrations, which in turn increases myocardial oxygen demand. The cardiovascular effects of general anesthesia include changes in the arterial and central venous pressures, cardiac output, and varying heart rhythms, which occur by the following mechanisms: decreased systemic vascular resistance, decreased myocardial contractility, decreased stroke volume, and

increased myocardial irritability. Induction of general anesthesia lowers systemic arterial pressures by 20-30%, tracheal intubation increases the blood pressure by 20-30 mm Hg, and inhalational agents lower cardiac output by 15%⁽²⁾.

A previously stable patient may decompensate postoperatively, leading to significant postoperative morbidity and mortality. A substantial number of all deaths among patients undergoing non cardiac surgery are caused by cardiovascular complications⁽³⁾.

The high prevalence of cardiac events associated with non cardiac surgery reflects the high prevalence of underlying Coronary artery disease in the general population, upon which the additional stresses of surgery are overlaid⁽⁴⁾.

The pathophysiology of perioperative myocardial infarction is complex, but may include myocardial oxygen demand/supply mismatch associated with tachycardia, hypertension, and pain⁽⁵⁾.

AIM OF THE WORK:

To study the effects of perioperatively administered beta-blockers for prevention of surgery-related mortality and morbidity in patients undergoing major abdominal surgery while under general anesthesia.

PATIENTS AND METHODS:

After approval of the ethical committee of Ain Shams University, Patients who were enrolled in this study were chosen from those attending pre-anesthesia check up visits in Ain Shams university hospitals. A written, informed and valid consent was obtained from every patient after proper explanation of the study procedure and the expected outcome in a clear language.

Inclusion Criteria: Adult patients of either sex, aged 50-70 years. History of

ischemic heart disease or having 2 or more risk factors for ischemic heart disease (hypertension, DM, obesity BMI > 30, smoking, hyperlipidemia, family history, stress, sedentary life style). Elective major abdominal surgery under general anesthesia. Expected surgery time more than 1 hour.

Exclusion Criteria: History of previous open heart surgery. Patients with bronchial asthma. Patients with heart failure. Patients with significant valve lesion (mitral stenosis with mitral valve area < 2 cm², aortic stenosis with aortic valve area < 0.9 cm² or severe aortic or mitral regurge) on echocardiography. Ejection fraction <40%. Patients with previous cerebro-vascular stroke. Preoperative hemoglobin level <10gm%. Preoperative patient heart rate < 45 bpm. Preoperative patient systolic blood pressure <100 mmHg. Emergency surgery. Massive intraoperative blood loss. Intraoperative hemodynamic instability. Prolonged surgery time >8 hours. Needing for re-exploration in the first week postoperative period. Needing for inotropic support intraoperative or in the post operative period.

This is an observational prospective non concurrent study, in which 240 patients were divided into 2 groups (120 patients each) as follows: **Beta blocker group (B group):** 120 patients on beta blocker (Bisoprolol 5 mg) started more than 15 days preoperative and continued for at least 7 days postoperative. **Control group (C group):** 120 patients not receiving any betablocker.

All patients were closely monitored for the possible cardiovascular mortality and morbidity as: Death (either cardiac or non cardiac). Non fatal myocardial infarction. Acute stroke. Arrhythmia. Heart failure. Significant hypotension (SBP < 100). Significant bradycardia (HR < 45 bpm)

Anesthetic Technique:

Preoperative: Pre-operative assessment of the patient was done, full detailed history

was taken, pre-operative labs such as CBC, full coagulation profile, kidney function tests, liver function tests, ECG, echocardiography and chest X-ray were checked. Demographic data as age, weight, and sex were recorded. The basal heart rate (HR), noninvasive arterial systolic blood pressure (SBP) and diastolic blood pressure (DBP), and peripheral oxygen saturation (SpO₂) were recorded. The usual daily dose of beta blocker was taken till the morning of the operation.

Intraoperative: An 18 G peripheral cannula was inserted and conventional general anesthesia was induced for all patients using: 1-2 mic / kg fentanyl, 1-1.5 mg/kg propofol, 0.5mg/kg atracurium are given, endotracheal intubation and volume controlled mechanical ventilation started. General anesthesia was maintained by 1 MAC isoflurane and 0.1 mg / kg atracurium every 20-30 min and adequate intraoperative analgesia. After induction, a urinary catheter, a central venous catheter and a radial arterial cannula were inserted. Close monitoring of heart rate, invasive blood pressure, peripheral oxygen saturation and recorded every 5 minutes. Central venous pressure, urine output and blood loss are monitored and recorded every hour.

Postoperative: After fulfilling criteria of complete recovery, all patients were extubated and transferred to ICU for close monitoring. ensuring that the usual daily dose of beta blocker should be restarted the next day postoperative and continued for at least 1 week postoperative.

Patients were monitored for 7 days with the following:

1- Vital data: was monitored closely for 7 days. Any significant hypotension (SBP <100 mmHg), and significant bradycardia (HR <45 bpm) were recorded. Significant hypotension was primarily treated with IV fluids resuscitation. Cases not responding to IV fluids and necessitating adding IV

vasopressor (Noradrenaline) were excluded from the study. Significant bradycardia were closely monitored, if prolonged and affecting tissue perfusion, BB needed to be discontinued and 0.6-1 mg atropine given. On the other hand, tachycardia with HR>100bpm was aggressively investigated and treated accordingly: Ensuring adequate analgesia with IV paracetamol 1gm/6-8 hrs and low dose narcotics if needed. Ensuring good hydration with IV crystalloids to maintain CVP 8-12 cmH₂O. Ensuring that there is no surgical cause (bleeding or leakage) by reassessing surgical wound and drains. Hypertension with SBP>150mmHg for 3 successive readings after exclusion of postoperative pain by providing good analgesia was treated by addition of antihypertensive dose of calcium channel blocker (amlodipine 5 mg daily)

2- 12-leads ECG: was done 6 hours and 12 hours postoperative and then every 24 hours till day 7. Any changes in rate or rhythm or signs of ischemia were recorded.

3- CKtotal, CK-MB, Troponin: Were done daily till day 7. when positive, they were repeated after 8 hours for confirmation of myocardial infarction. When diagnosis of acute MI was established, patient was treated by antiplatelets (aspirin 150 mg), analgesic (morphine 0.1 mg/kg), O₂ administration and good monitoring.

4- Echocardiography: was done if there is any positive event (elevated cardiac enzymes or signs and symptoms of heart failure) and any new changes different from baseline echocardiography will be recorded.

5- Assessment of heart failure: Clinical assessment: Elevated central venous pressure, congested neck veins, pulmonary congestion, lower limb edema, cold extremities, hypotension.

Laboratory assessment: β -Natriuretic peptide (β NP): It is generated by cardiomyocytes due to myocardial stretch. Its elevated levels indicates heart failure.

Troponin: Elevated levels indicates myocardial injury.

Imaging: Chest x-ray to assess heart size and pulmonary congestion and to detect alternative cardiac, pulmonary, and other diseases that may cause or contribute to the patient's symptoms. 2-dimensional echocardiogram with Doppler was performed to assess ventricular function, size, wall thickness, wall motion, and valve function. When diagnosis of heart failure was confirmed, antifailure measures started with diuretics and low dose ACEIs.

Assessment of stroke:

a) Clinical assessment:

National Institutes of Health Stroke Scale (according to AHA/ASA guidelines 2018)⁽⁶⁾.

Imaging: MRI brain is done if suspected stroke. And if diagnosis of stroke was confirmed, patient was treated with

palliative medications and intubation and ventilation once indicated ⁽⁶⁾.

Need to stop the drug in the post operative period for any reason was recorded:

Statistical method:

Statistical presentation and analysis of the present study was conducted, using the mean, standard Deviation, unpaired student t-test and chi-square tests by (IBM SPSS Statistics for Windows, Version 20.0. Armonk, NY: IBM Corp.). Unpaired Student T-test was used to compare between tow groups in quantitative data.

Chi-square: The hypothesis that the row and column variables are independent, without indicating strength or direction of the relationship. Pearson chi-square and likelihood-ratio chi-square. Fisher's exact test and Yates' corrected chi-square are computed for 2x2 tables.

RESULTS:

Table (1): Demographic data (Age, sex and weight).

Demographic data	BB (N=120)	Control (N=120)	Tests	
			t/X ²	P-value
Age (years)				
Range	50-67	52-70	0.837	0.404
Mean±SD	61.54±4.26	62.05±5.14		
Sex				
Female	58(48.3%)	47(39.2%)	1.693	0.193
Male	62(51.7%)	73(60.8%)		
Weight (kg)				
Range	25-39	28-37	1.284	0.201
Mean±SD	34.25±8.52	32.89±7.88		

Table (2): Incidence of bradycardia in beta blocker group and control group.

Bradycardia	Groups			
	BB		Control	
	N	%	N	%
No bradycardia	74	61.7	108	90.0
Bradycardia	46	38.3	12	10.0
Total	120	100.0	120	100.0
Chi-square	X ²	26.283		
	P-value	<0.001**		

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Table (3): Incidence of arrhythmia in beta blocker group and control group.

Arrhythmia		Groups			
		BB		Control	
		N	%	N	%
No arrhythmia		104	86.7	72	60.0
Arrhythmia		16	13.3	48	40.0
Total		120	100.0	120	100.0
Chi-square	X ²	21.818			
	P-value	<0.001**			

Table (4): Incidence of stroke in beta blocker group and control group.

Stroke		Groups			
		BB		Control	
		N	%	N	%
No stroke		118	98.3	118	98.3
Stroke		2	1.7	2	1.7
Total		120	100.0	120	100.0
Chi-square	X ²	0.000			
	P-value	1.000			

Table (5): Incidence of myocardial infarction in beta blocker group and control group.

MI		Groups			
		BB		Control	
		N	%	N	%
No MI		112	93.3	108	90.0
MI		8	6.7	12	10.0
Total		120	100.0	120	100.0
Chi-square	X ²	0.873			
	P-value	0.350			

Table (6): Incidence of heart failure in beta blocker group and control group.

HF		Groups			
		BB		Control	
		N	%	N	%
No HF		117	97.5	118	98.3
HF		3	2.5	2	1.7
Total		120	100.0	120	100.0
Chi-square	X ²	0.204			
	P-value	0.651			

Table (7): Incidence of hypotension in beta blocker group and control group.

BP<100		Groups			
		BB		Control	
		N	%	N	%
BP>100		88	73.3	102	85.0
BP<100		32	26.7	18	15.0
Total		120	100.0	120	100.0
Chi-square	X ²	4.952			
	P-value	0.026*			

Table (8): Incidence of mortality cases in beta blocker group and control group.

Mortality	Groups			
	BB		Control	
	N	%	N	%
Died	2	1.7	2	1.7
Alive	118	98.3	118	98.3
Total	120	100.0	120	100.0
Chi-square	X ²	0.000		
	P-value	1.000		

DISCUSSION:

This study was performed on 240 patients undergoing major abdominal surgery. Seven outcomes were studied comparing perioperative mortality and morbidity occurring in patients receiving beta blockers to patients not receiving any beta blockers.

In this study, it was noticed that bradycardia with HR less than 45 bpm happened in 46 patients (38.3% of patients) in beta blocker group compared to 12 patients (10% of patients) in the control group.

When evaluating trials investigating bradycardia, it was noticed that bradycardia was defined very differently by study authors. Some classified a heart rate below 60 beats per minute as bradycardia,

Whereas others detected an episode of bradycardia only if heart rate fell below 40 beats per minute, or if bradycardia required treatment. These different thresholds for bradycardia are likely to have caused clinical and statistical heterogeneity⁽⁷⁾.

In a metaanalysis of 8 studies done by *Blessberger et al*⁽⁷⁾ including 660 patients undergoing cardiac surgery, they found no clear evidence of an effect of beta-blockers on episodes of bradycardia in the setting of heart surgery (RR1.61, 95%CI 0.97 to 2.66, P value 0.06).

Regarding non cardiac surgery, several studies were done to evaluate the effect of beta blocker on bradycardia. in the POBBLE 2005, 103 patients undergoing infrarenal

vascular surgery among which bradycardia occurred to 30 out of 53 patients receiving beta blocker (15.9%) compared to 6 out of 44 patients (2.6%) of the patients in the control group⁽⁸⁾.

Also in another study done on a large number of patients the POISE study (Perioperative ischemic evaluation) 2008., 8531 patients undergoing non cardiac surgery, it was noticed that bradycardia occurred in 6.6 % in the betablocker group compared to 2 % in the control group and it was concluded that beta blocker therapy would result in excess of 42 patients experiencing clinically significant bradycardia for every 1000 treated⁽⁹⁾.

In contrast, the results obtained by a study made by *Moon et al.*⁽¹⁰⁾ showed no significant difference between betablocker group and control group as regards occurrence of bradycardia.

Regarding the occurrence of arrhythmia either ventricular or supraventricular. It was found in the beta blocker group, that arrhythmia occurred in 16 out of 120 patients representing 13.3% compared to the control group in which it occurred to 48 out of 120 patients representing 40% of the patients in the control group.

Results was found to show significant difference favoring beta blocker in reducing these arrhythmias.

These results were concomittent to those of a study made by De Azevedo et al. on 100 patients undergoing cardiac surgery, supraventricular arrhythmia occurred to 11%

of patients on beta blocker compared to 24 % of patients in the control group⁽¹¹⁾.

Also beta blocker significantly reduces ventricular arrhythmias and extrasystoles in patients undergoing cardiac surgery, as shown in a study by *Sun et al.*⁽¹²⁾.

In the POBBLE study done in 2005, which was a double-blind randomized placebo-controlled trial, participants were 103 patients without previous myocardial infarction who had infrarenal vascular surgery. patients were closely monitored by ECG Holter for 72 Hrs postoperatively. and the results showed no significant protective effect of beta blocker between 2 groups⁽⁸⁾.

The POISE study done in 2008 was done on a large number of patients and found that arrhythmia occurred to 2.1% of patients on beta blocker compared to 2.8% of the control group⁽⁹⁾.

Another study done in 2006 by Lai et al shows more significant difference between the 2 groups of patients diagnosed with oesophageal cancer. The esophageal cancer patients, no less than 65 years old, scheduled for elective esophagectomy were enrolled, and randomized into metoprolol group and control group. The patients of metoprolol group received metoprolol to control heart rate from anesthesia induction to 72 h after operation. The results showed that patients enrolled in the beta blocker did not experience arrhythmias compared to 4 out of 30 cases in the control group⁽¹³⁾.

In this study, results showed no difference between 2 groups regarding cerebrovascular events. When comparing this results to previous studies, we found that Five studies evaluated cerebrovascular events in non-cardiac surgery (9150 participants). Only the largest of the five trials found a significant increase in cerebrovascular events in the beta-blocker group compared with the control group at an alpha level of 0.05, in contrast to the results

concluded by the present study which showed no significant difference.

In contrast, the other four trials yielded non-significant results. Overall, we found no clear evidence of an effect of beta-blockers on cerebrovascular events in non-cardiac surgery^(14,15).

Regarding myocardial infarction, it was found that the protective effect of beta blocker was statistically insignificant. when comparing our results to previous studies, we found no AMI occurred in the beta-blocker group nor in the control group in a study done by *Lai et al.*⁽⁶⁾ in 2006 this study included small number of oesophageal cancer patients. Other trials found no statistically significant difference between the beta-blocker group and the control group at an alpha level of 0.05.

Only the large POISE trial *Devereaux et al.*⁽¹⁶⁾ could identify a protective effect of beta-blockers. This single trial had a weight of 80% in a meta-analysis done by *Blessberger et al.*⁽⁷⁾. Overall, beta-blockers statistically significantly reduced perioperative AMI by 27% in non-cardiac surgery⁽⁷⁾.

The results of this study show no significant effect of beta blocker on the occurrence of heart failure in the perioperative period in non cardiac surgery. comparing the obtained results to many studies included in the meta analysis done by *Blessberger et al.*⁽⁷⁾ who also found no evidence of an effect of beta-blockers on the occurrence of congestive heart failure (RR 1.18, 95% CI 0.94 to 1.48, P value 0.16) The effect of beta blocker treatment remained non-significant throughout all subgroup analyses in that study.

The findings obtained from the present study are also consistent with results of the meta-analysis by Bangalore and colleagues. Likewise, the review authors could not find an interaction between beta-blocker intake

and development of perioperative congestive heart failure⁽¹⁷⁾.

A meta-analysis of 22 trials (10,947 participants) in non-cardiac surgery indicated that beta-blockers significantly increased hypotensive episodes (RR 1.50, 95% CI 1.38 to 1.64, P value < 0.00001). This effect remained unchanged and consistent throughout all subgroup analyses⁽⁷⁾.

These results are similar to the results obtained by the present study. It was also concluded a significant increase in episodes of hypotension in patients.

These results were different than those obtained by a study made by Moon et al and another study by Shukla et al which showed no significant difference between beta blocker and control group as regards occurrence of hypotension^(10,18).

Results from two other meta-analyses were within the same range compared with the present estimate: Bangalore and colleagues found a 62% increase in hypotensive episodes (OR 1.62, 95% CI 1.44 to 1.82, P value < 0.0001; *Bangalore*⁽¹⁷⁾, and meta-analysis of 'secure' RCTs by Bouri and colleagues revealed a 51% rise in hypotension in the beta-blocker group (RR 1.51, 95% CI 1.37 to 1.67, P value < 0.00001)⁽¹⁹⁾.

In the POISE trial, hypotension was the risk factor with the highest population attributable risk that caused stroke and ultimately increased mortality in patients taking beta-blockers⁽¹⁶⁾.

Also In this study, equal cases of mortality happened in both groups showing no effect of beta blocker on mortality. Comparing our results to *Blessberger et al.*⁽⁷⁾ metaanalysis, which studied all cause mortality in 13 trials, in 3 studies no deaths occurred in the beta-blocker group nor in the control group^(13,20).

In the POISE trial *Devereaux et al.*⁽¹⁶⁾, a significant increase in mortality was observed, whereas in the remaining of the 13 trials, no significant difference was found between the beta-blocker group and the control group at an alpha level of 0.05. Overall, it was found that beta-blockers increased perioperative mortality⁽⁷⁾.

Conclusion:

Patients on beta blocker are at less risk of perioperative arrhythmias and myocardial infarction when undergoing high risk surgeries. These patients are at higher risk of experiencing episodes of bradycardia and hypotension. No significant effect on perioperative heart failure, cerebrovascular stroke and mortality.

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استخدام حاصرات بيتا في الفترة المحيطة بالعملية الجراحية في المرضى ذوي المخاطر المرتفعة
المجتازين جراحة باطنية عظمية وأثرها على العواقب المرضية والوفائية للجهاز القلبي الوعائي
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مقدمه: تعد مضاعفات القلب المحيطة بالجراحة مصدر قلق كبير للملايين من الأفراد الذين يخضعون للجراحة في جميع أنحاء العالم كل عام. بعد الجراحة، يعاني ٢٪ من هؤلاء المرضى من مضاعفات قلبية كبيرة.

تؤدي العمليات الجراحية غير القلبية إلى زيادة في تركيزات الكاتيكولامين التي تؤدي بدورها إلى زيادة في معدل ضربات القلب وضغط الدم وتركيزات الأحماض الدهنية، مما يؤدي بدوره إلى زيادة احتياج عضلة القلب إلى الأوكسجين. تشمل الآثار القلبية للتخدير العام تغيرات في ضغط الدم الوريدي المركزي والشرياني، والإخراج القلبي، وإيفاعات القلب المختلفة.

تشير كل العمليات الجراحية استجابة للتوتر. تبدأ هذه الاستجابة بإصابة الأنسجة وتوسطها عوامل الغدد الصم العصبية، وقد تحفز عدم انتظام دقات القلب وارتفاع ضغط الدم. تضيق الاضطرابات في سائل الجسم في الفترة المحيطة بالجراحة إلى الإجهاد الجراحي. يزيد هذا الإجهاد الجراحي من الطلب على احتياج الأوكسجين لعضلة القلب.

قد تتدهور حالة المريض الذي كان مستقرًا في السابق بعد العملية الجراحية، مما يؤدي إلى مضاعفات ووفيات في فترة ما بعد الجراحة. وهناك عدد كبير من الوفيات بين المرضى الذين يخضعون للجراحة سببها مضاعفات القلب والأوعية الدموية.

تعتبر الفسيولوجيا المرضية لازمة القلبية المحيطة بالجراحة معقدة، ولكنها قد تشمل عدم تطابق الطلب / العرض على الأوكسجين في عضلة القلب بسبب عدم انتظام دقات القلب وارتفاع ضغط الدم والألم.

يعتبر الأساس المنطقي الرئيسي لاستخدام حاصرات بيتا في الفترة المحيطة بالعملية الجراحية هو تقليل استهلاك الأوكسجين لعضلة القلب عن طريق خفض معدل ضربات القلب، مما يؤدي إلى فترة أطول في الملء الانبساطي وانخفاض انقباض عضلة القلب.

الهدف من العمل: لدراسة آثار حاصرات بيتا حول الجراحة للوقاية من الوفيات والمضاعفات المرتبطة بالجراحة في المرضى الذين يخضعون لجراحة البطن الكبرى تحت التخدير العام

المرضى و الطرق المتبعة في الدراسة: لقد وجد أن الدراسة الاستطلاعية المراقبة هي أنسب تصميم من أجل تحقيق أهداف الدراسة، و قد تم تقدير العينة المطلوبة احصائيا بعدد ٢٤٠ مريض مقسمين إلى مجموعتين متساويتين:

مجموعة حاصرات بيتا: ١٢٠ مريض يتعاطون حاصرات بيتا على الأقل ١٥ يوم قبل العملية و ايضا على الأقل ٧ أيام بعد العملية.

مجموعة مرجعية: ١٢٠ مريض لا يتعاطون اي نوع من حاصرات بيتا.

تم المتابعة الدقيقة لجميع المرضى للعواقب المرضية و الوفائية للجهاز القلبي الوعائي منها:

الوفاة (اسباب قلبية و غير قلبية). ذبحة قلبية. جلطة دماغية حادة. اضطراب نظم القلب. قصور القلب. هبوط ضغط الدم. انخفاض ضربات القلب.

في هذه الدراسة، لوحظ أن بطء نبضات القلب أقل من ٤٥ نبضة في الدقيقة حدث في ٤٦ مريضا (٣٨.٣٪ من المرضى) في مجموعة حاصرات بيتا مقارنة مع ١٢ مريضا (١٠٪ من المرضى) في المجموعة الضابطة.

فيما يتعلق بحدوث عدم انتظام ضربات القلب سواء البطيني أو فوق البطيني. لقد وجد في مجموعة حاصرات بيتا أن إيفاق القلب غير المنتظم حدث في ١٦ من أصل ١٢٠ مريضًا يمثلون ١٣.٣٪ مقارنةً بمجموعة الضبط التي حدثت فيها إلى ٤٨ من كل ١٢٠ مريضًا يمثلون ٤٠٪ من المرضى في المجموعة الضابطة.

في هذه الدراسة، أظهرت النتائج عدم وجود فرق بين المجموعتين فيما يتعلق بالأحداث الدماغية وفشل القلب.

حدثت حالات متساوية من الوفيات للمرضى في كلتا المجموعتين.

فيما يتعلق بخفض ضغط الدم مع ضغط الدم الانقباضي > 90 مم زئبق، وجدنا أنه حدث لـ 32 مريضاً يمثلون 26.7% من مجموعة حاصرات بيتا، مقارنة بـ 18 مريضاً يمثلون 15% من المجموعة الضابطة.

استنتاج

بعد تحليل النتائج تبين أن المرضى الذين يتناولون حاصرات بيتا هم أقل عرضة لخطر عدم انتظام ضربات القلب المحيطة بالجراحة واحتشاء عضلة القلب عند إجراء عمليات جراحية عالية الخطورة.

هؤلاء المرضى هم أكثر عرضة لخطر الإصابة بنوبات ببطء القلب وانخفاض ضغط الدم.

لا يوجد تأثير كبير على قصور القلب المحيطة بالجراحة والسكتة الدماغية والوفيات.