



β –BLOCKER DRUGS EFFECT ON THE HEART RATE CIRCADIAN RHYTHM

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INTRODUCTION

Beta blockers, also called beta adrenergic blocking agents, block the release of the stress hormones adrenalin and noradrenalin in certain parts of the body. This results in a slowing of the heart rate and reduces the force at which blood is pumped around your body.^[1]

The effect of beta blockers on heart rate has been studied extensively at rest, during exercise, and by ambulatory electrocardiography during the day and night. The heart rate is higher during exercise and in daytime hours as compared to rest and nighttime sleep. These differences has been attributed in part to changes in sympathetic tone (the circadian rhythm).^[2,4] Beta blockers lower heart rate, and this effect is more pronounced during exercise^[5,6] and in the daytime as compared to rest and nighttime^[7,8] when subjects are presumably a sleep. The aim of this study was to investigate the effect of beta blocker drugs on the heart rate variation.

SUBJECTS AND METHODS

The present study represents a case_control study; conducted during the period from the 20th of October 2023 to the 20th of November 2024.

The clinical datasets of (94) patients visiting Cardiac Function Tests Department at Ibn Sina Teaching Hospital

were included in this study. There were (45) patients in the beta blocker (BB) group and 50 patients in the without BB (NBB) group. We studied their 24 hours ECG recordings by Holter Device with the minimum and maximum heart rate recordings were recruited in the study.

Their age ranged from (18-75) years old, divided into (34) male and (60) female patients.

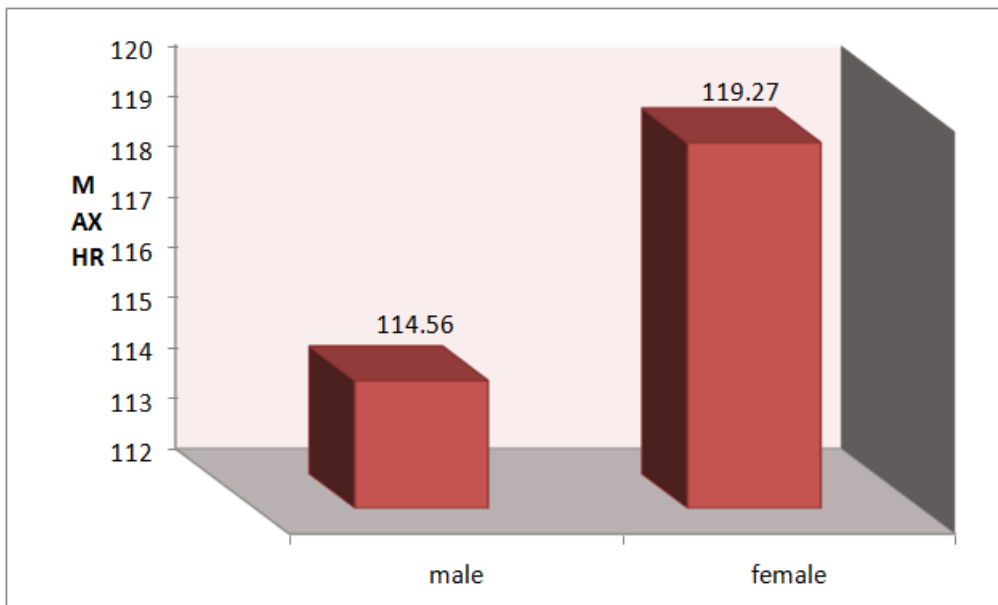
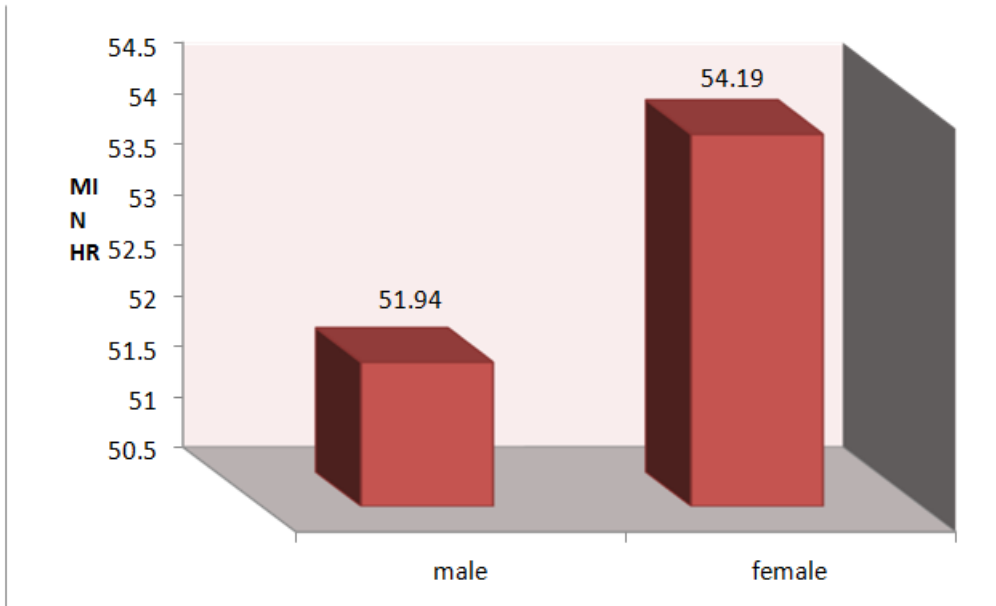
RESULTS

In this study, the number of shared subjects was 94, their age ranged between (18_75) years old.

The mean of the MIN heart rate in male patients using b_blocker drugs was (51.9444) and it was (54.1923) in female patients using b_blocker drugs, compared with MIN heart rate of (60.4375) in male subjects not used b_blocker drugs and (58.2353) in female subjects not used b_blocker drugs.

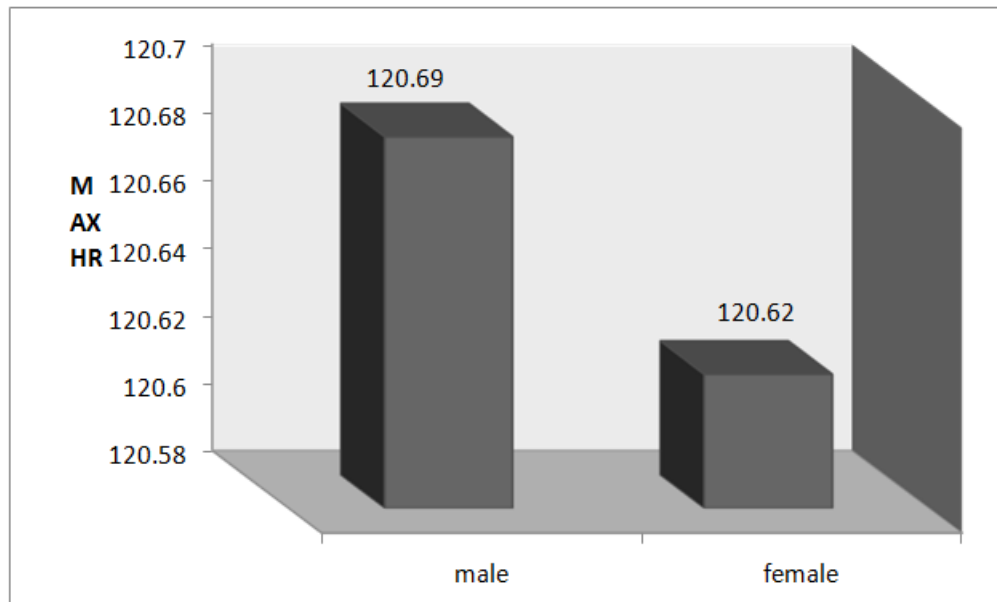
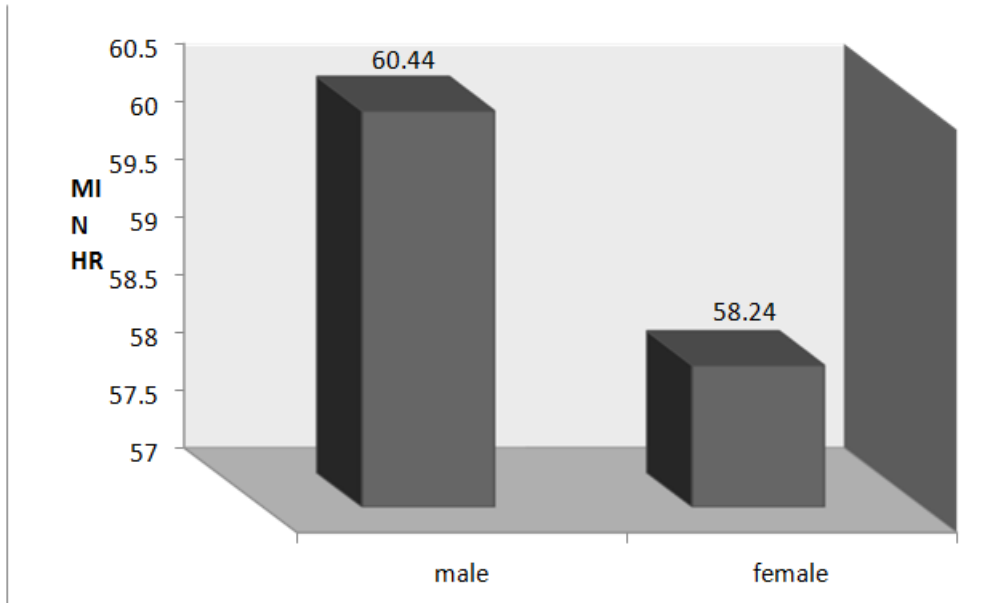
Group Statistics

Cases		N	Mean	t-value	sig	Std. Deviation	Std. Error Mean
MIN HR	Male	18	51.9444	-.806-	.425	9.23212	2.17603
	Female	26	54.1923	-.802-	.428	9.00231	1.76550
MAX HR	Male	18	1.1456E2	-.464-	.645	42.38371	9.98994
	Female	26	1.1927E2	-.424-	.675	24.94724	4.89256



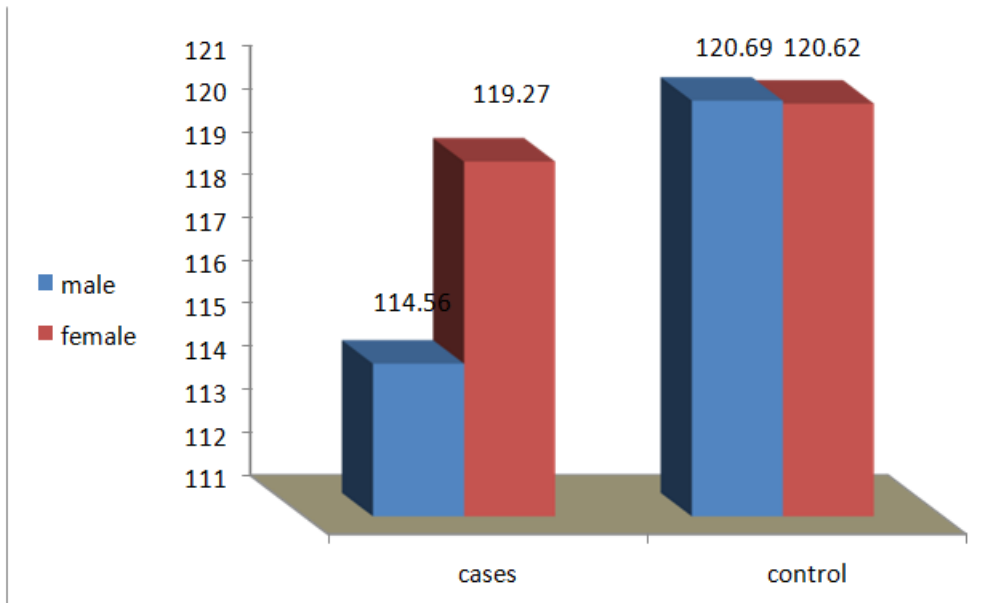
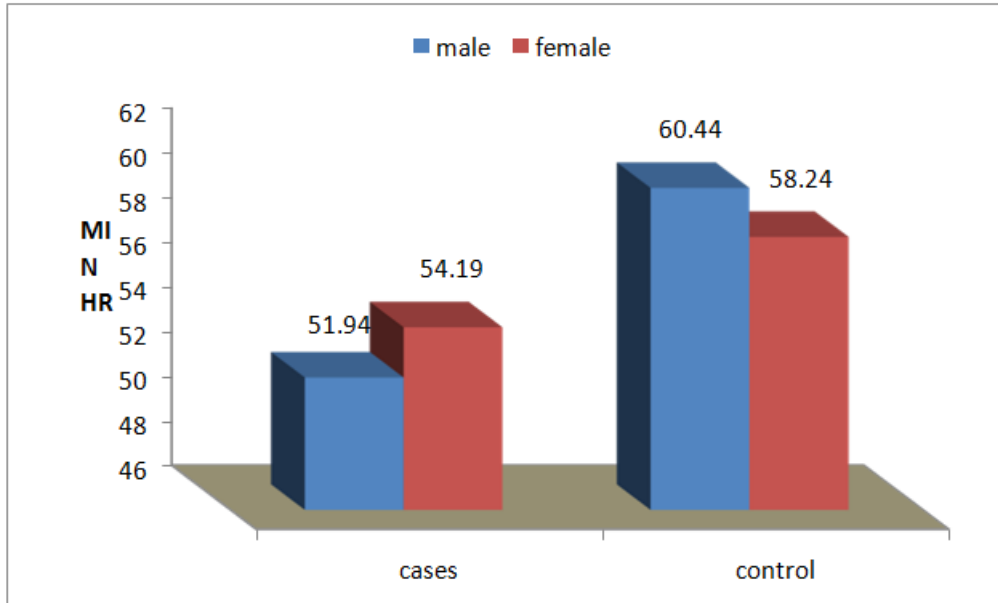
Group Statistics

Control		N	Mean	t-value	sig	Std. Deviation	Std. Error Mean
MIN HR	Male	16	60.4375	.584	.562	17.03318	4.25829
	Female	34	58.2353	.482	.635	9.66110	1.65687
MAX HR	Male	16	1.2069E2	.013	.990	18.52465	4.63116
	Female	34	1.2062E2	.013	.990	18.06388	3.09793



Report

		MIN HR	MAX HR
Male case	Mean	51.9444	114.5556
	N	18	18
	Std. Deviation	9.23212	42.38371
Female cases	Mean	54.1923	119.2692
	N	26	26
	Std. Deviation	9.00231	24.94724
Male control	Mean	60.4375	120.6875
	N	16	16
	Std. Deviation	17.03318	18.52465
Female control	Mean	58.2353	120.6176
	N	34	34
	Std. Deviation	9.66110	18.06388
p-value		0.077 n.s	0.87 n.s



The mean of the MAX heart rate in male patients using b-blocker drugs was (114.5556) and it was (119.2692) in female patients using b_blocker drugs, compared with MAX heart rate of (120.6875) in male subjects not using b_blocker drugs and (120.6176) in female subjects not using b_blocker drugs.

DISCUSSION

Incidence of sudden cardiac death peaks during the early morning hours when there is a rapid decrease of Vagal tone and increase of sympathetic tone. Intrinsic and extrinsic regulation of heart rhythm and the force of contraction are important for the control of cardiac function.^[9] In our case control study, we assessed the effects of beta blocker drugs on the circadian rhythm of the heart rate in (94) subjects both male and female who

used beta blocker drugs and compare them with control group not using these drugs, we found that heart rate was significantly affected by these drugs especially at night, The use of BBs reduces the mean heart rate significantly.^[10]

Studies on the Carvidolol Or Metoprolol European Trial (COMET) shows that betablockers have specific effects on heart rate circadian rhythm and must selected carefully depending on the symptoms and signs of the patients.^[11] other clinical study of the effect of beta blockade on heart rate variability in patients with coronary artery disease showed that beta blocker drugs induce a significant increase in the heart rate variability.^[12] other study on the heart rate variability of patients receiving betablocker therapy demonstrated an

increase in the heart rate variability measures compared with non medication group.^[13]

CONCLUSION

Beta_blocker drugs increase heart rate variability in coronary artery disease patients because they slow down the rapid increase in sympathetic nervous system activity in patients at morning this will contribute to the protective effects of beta _ blocker drugs in patient with ischemic heart disease and these drugs should be selected carefully according to the symptoms and signs of the patient in order to avoid excessive decrease in heart rate at night.

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