PROGNOSTIC ROLE OF BETA BLOCKERS IN CRITICALLY ILL PATIENTS PRESENTING WITH ACUTE ISCHEMIC STROKE IN ALEXANDRIA UNIVERSITY HOSPITALS

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Introduction

Ischemic Stroke is defined by World Health Organization (WHO) as acute focal dysfunction of brain, originating from vessels lasting for more than 24 hours.

An acute stroke refers to the first 24-hour- period of a stroke. Focal neurological deficit lasting less than 24 hours known as transient ischemic attack. Acute ischemic stroke patients often need Intensive Care Unit (ICU) admission for different causes like disturbed level of consciousness and airway compensation. A pathological sympathetic activation with a surge in catecholamines occurs in the acute phase of stroke, and both the sympathetic over-activation and the subsequent autonomic dysfunction are predictors of poor functional outcome. In addition to increasing the risk of cardiac arrhythmias, the autonomic dysfunction and sympathetic over-activation may have a role in the development of stroke-induced immunodepression, which could increase the risk of infections. The post-stroke changes in the immune system include an increased number of circulating monocytes, higher levels of anti-inflammatory cytokines and a shift from Th1 to Th2 cytokine production. Beta-blockers showed a protective effect and an ability to block and reverse these catecholamine induced changes on the immune system. In addition to this, beta-blockers have been reported to reduce infarct size by antioxidant and free radical scavenging properties.

Aim of the work

The aim of this study was to assess the possible prognostic role of beta blockers in patients presenting with acute ischemic stroke as regards:

Primary outcome 28 days mortality.

Secondary outcome Functional outcome. And Stroke related infections.

PATIENTS AND METHODS

Patients: 120 Patients with acute ischemic stroke admitted to Critical Care Medicine Department in Alexandria University Hospitals according to sample size calculation.

Inclusion Criteria: Adult patients presented with acute ischemic stroke with established stroke on CT admitted to critical care units of Alexandria university hospitals after 48 hours of established diagnosis.

Exclusion Criteria: Age less than 18 years old, Acute hemorrhagic stroke, Patients received tissue plasminogen activator (tPA), Patients with contraindications to beta blockers use.

METHODS: This study was a prospective study that was done on Patients with acute ischemic stroke. After approval of medical ethics committee of Alexandria Faculty of Medicine, formal consent had been taken from the patients or patient's relatives before being enrolled into the study.

The following data were collected from every patient: Demographic data: Age &sex and smoking index, complete history taking including: Past medical history (DM, HTN, CVD and dyslipidemia), Drug history. Complete physical examination including: Vital signs, mean arterial pressure, heart rate, respiratory condition, oxygen saturation, Glascow coma score. Laboratory investigations .Radiological investigations including CT brain on admission , chest X-ray and Echocardiography. National institute of health (NIHSS) stroke scale was applied for all the patients upon admission. Patients were divided into two groups, each group were sixty patients, Group I sixty acute stroke patients who were managed conventionally and received beta blocker therapy (bisoprolol fumarate in dose of 5 mg once daily for 28 days),Group II sixty acute stroke patients who were managed conventionally without beta blocker therapy. Outcome measures were ICU mortality and functional outcome follow up with Changes in GCS, improvement of muscle power, & change in modified rankin scale, and follow up for Development of infections related to stroke as pneumonia and urinary tract infection.

Results

Table (1): Comparison between the two studied groups to regarding GCS to follow up functional outcome.

GCS	Group I With beta blocker "n=60"	Group II Without beta blocker "n=60"	t-test P1
Initial GCS Range Mean±SD	5-15 13.08±2.09	5-15 12.57±1.87	1.912 0.078
Follow up GCS Range Mean±SD	3-15 12.42±3.54	3-15 9.90±4.21	7.01 0.001*
t-test P2	1.35 0.169 N.S.	1.67 0.098 N.S	

Table (2) : Comparison between the two studied groups regarding mortality outcome.

Outcome	Group I With beta blocker "n=60"		Group II Without beta blocker "n=60"	
	No	%	No	%
Die	6	10.0	10	16.7
Improved	18	30.0	10	16.7
Same	26	43.3	15	25.0
Deteriorated	10	16.7	25	41.7
X^2 P value	12.66 0.005*			

This table (2) showed that same outcome was higher in group I with 26(43.3%) followed by improved 18(30%) while in group II, deteriorated outcome was higher with 25(41.7%) followed by same outcome 15 (25%).

Table (3) Comparison between the two studied groups regarding rankin at intial and follow up to asses functional outcome.

	Group I With beta blocker "n=60"	Group II Without beta blocker "n=60"	t-test P1
Initial rankin Range Mean±SD	1-5 2.77±1.17	1-5 2.93±1.40	0.88 0.240
Follow up rankin Range Mean±SD	0-6 2.75±1.61	1-6 3.87±1.72	4.21 0.001*
t-test P2	0.521 0.651 N.S.	2.06 0.034*	

Table (4): Comparison between the two studied groups regarding incidence of complication.

Complication	Group I With beta blocker "n=60"		Group II Without beta blocker "n=60"		P value
	No	%	No	%	
No complication	53	88.3	26	43.3	0.002*
Pneumonia	7	11.7	33	55.0	0.001*
UTI	2	3.3	5	8.3	0.311

Conclusion

beta blockers are considered a potential therapeutic agent for acute stroke patients; It showed clinical improvement for some patients, regarding functotional outcome& lowering pneumonia complication. Further studies is recommended