

To Find out the Association of Mortality in Acute Heart Failure patients with Raised Serum Gamma-Glutamyl Transferase (GGT)

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ABSTRACT

Aim: To find out the association of in hospital mortality in acute heart failure patients with raised serum Gamma-glutamyl Transferase.

Study Design: Prospective Cohort Study.

Study Setting: The study was conducted at medical OPD as well as Medical Emergency department, Services hospital, Lahore.

Duration Of Study: Study was completed in Six months after approval of synopsis i.e. from 16-12-14 to 15-06-15.

Methodology: 122 with raised GGT and 122 with normal GGT cases with acute heart failure presenting to emergency department of Services Hospital were enrolled in the study. Acute heart failure was diagnosed after initial stabilization of patient by echocardiography. Patients were followed for 7 days to determine hospital mortality.

Results: 49 patients (20.1%) died during their stay in hospital. Among 49 patients who died in hospital, 15 were having normal GGT and 34 were having raised GGT. Relative risk for in hospital mortality in acute heart failure patients was 2.67. Older age nullified the association between raised GGT and hospital mortality.

Conclusion: There is an association between raised Gamma Glutamyl Transferase (GGT) and hospital mortality in patients with acute heart failure.

Keywords: Acute heart failure, GGT, Mortality

INTRODUCTION

In the world, acute heart failure (AHF) is a major etiology of morbidity and mortality¹. Early diagnosis of patients with AHF is important². GGT catalyses the first step in the degradation of extracellular glutathione (GSH), allowing for the precursor amino acids to be utilized for intracellular GSH synthesis. Therefore, GGT favors the cellular supply of GSH. GSH is antioxidant of the cell^{3,4}. Raised GGT activity predicts outcomes in patients with acute heart failure. GGT is important in the list of clinical tests used in initial segregation of patients^{5,6}.

METHODOLOGY

The study was conducted at Medical Emergency department, Services hospital, Lahore. 244 patients were selected.

Inclusion Criteria

- Age 30 – 70 years and both sexes were selected. Only new cases of acute heart failure with less than 24 hours according to operational definition:
- Exposed group with GGT level > 40.4 iu/ml,
- Unexposed group with GGT level < 40.4 iu/ml.

Exclusion Criteria

- With known evidence of acute myocardial ischemia by ECG showing ST elevation or depression or T wave inversion
- History of alcohol intake
- Evidence of hepatitis by ultrasonography showing coarse echo texture
- BMI <18kg/m²
- Recent major surgical procedure or trauma determined by history
- Known cases of nonalcoholic fatty liver disease determined by history and ultrasonography (fatty infiltration >30%)
- Patients with end stage renal disease (creatinine clearance < 15 mL/min)

Data Collection: 244 consecutive cases with acute heart failure presenting to emergency department of Services Hospital. 122 with Raised Serum GGT and 122 normal Serum GGT were enrolled in the study. Informed consent was obtained from all patients. Acute heart failure was diagnosed by echocardiography. Serum GGT was measured by using standard chemical analyzer. Patients were followed for 7 days to determine hospital mortality. Data collected was entered and analyzed in the SPSS version 17. Both groups were compared using chi square test to determine the significant difference in frequency of hospital mortality and post

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stratification difference. p value <.05 was taken as significant.

RESULTS

Detail of results is given in tables 1, 2, 3, 4 and 5.

Table 1: Age distribution:

Ages (yrs)	Frequency	%age
55 & above	101	41.6
<55 Year	143	58.4
Total	244	100

Table 2: Distribution of Gender

Gender	Frequency	%age
Male	94	38.5
Female	150	61.5
Total	244	100

Table 3: Frequency of Hospital Mortality

	Frequency	%age
Yes	49	20.1
No	195*	79.9
Total	244	100

*P<0.01 (significant)

Table 4: Distribution of GGT

GTT	n	%age
Raised GGT	122	50
Normal GGT	122	50
Total	244	100

Table 5: Hospital Mortality and GGT

GGT	Hospital Mortality	
	Yes	No
Normal GGT	15	107
Raised GGT	34*	88
Total	49	195

*P<0.01 (significant)

DISCUSSION

Raised serum GGT level predicts in unselected population and in patients with acute heart failure. GGT is thus a useful addition to the list of clinically available tests used in segregating patient risk⁶. Selected data is present on the prognostic value of GGT in patients with acute heart failure in Asian and Pakistani population⁷.

In our study, among 49 patients who died in hospital 15 were having normal GGT and 34 were having raised GGT (p<0.01). Relative risk for hospital mortality in acute heart failure patients was 2.67. It implies that for Pakistani population, we may safely conclude that raised GGT has prognostic value in predicting in hospital mortality.

In another study to assess the relationship between serum GGT levels and acute heart failure, GGT level was significant statistically (p<0.01) with mortality in the hospital (i.e., 15.3% vs 4.6%) in groups i.e. raised vs normal GGT³.

Among 29 patients with age <55 years who died during hospital stay, 8 were having normal GGT and 21 had raised GGT. Relative risk for hospital mortality in acute heart failure patients was 2.815. Whereas 20 patients with age >55 years, 7 showed normal GGT and 13 showed raised GGT. Relative risk for hospital mortality in acute heart failure patients was 1.682. Results were non-significant (p=0.210) for this group. It showed that GGT is better indicator of risk in young patients only.

CONCLUSION

There is an association between raised GGT and hospital mortality in patients with acute heart failure. GGT has prognostic value in predicting hospital mortality in patients with acute heart failure.

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