



## Correspondence

### Fragmented QRS complex as a predictor of coronary artery disease in patients with acute coronary syndrome (A study from Egypt)



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## ABSTRACT

**Methods:** Two groups according to the presence of fQRS in ECG.

**Results:** fQRS has higher sensitivity for LAD, LCX & RCA, more specific for LAD.

**Conclusions:** fQRS is a good, simple, applicable positive test to predict the presence of significant CAD in acute coronary syndrome (ACS), even without enzyme elevation.

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## 1. Introduction

Theoretically, fQRS is due to heterogeneous myocardial electrical activation from regional ischemia, myocardial fibrosis or scar.<sup>1</sup>

We aimed to detect if the presence of fragmented QRS complex in patient with acute coronary syndrome (ACS) can predict the presence of coronary artery lesion and to which extent in Egyptian patients.

## 2. Methods

This cross-sectional study included 74 patients presented with ACS.

Patients with heart diseases that may carry fQRS were excluded from the study.

Approval was obtained and after giving a written informed consent, all participants were subjected to the following:

Full history taking & thorough physical examination,

Cardiac troponin T, on admission and 6–8 h later if the first set was negative (>0.1 ng/ml was positive).

Resting standard 12 lead ECG was analyzed at baseline then/6 h for fQRS; additional R wave or notching in the nadir of the S wave, or the presence of 2 R(fragmentation) in 2 contiguous leads with a QRS duration <120 ms.

Echocardiography, using VIVID System 5 machine, for systolic function and wall motion abnormalities.

Coronary angiography, either immediately or after stabilization, according to the plan using the visual method for evaluation of the coronaries (>70% stenosis in major epicardial vessel is significant disease).

According to the presence of fQRS, patients were divided into two groups:

Group I; 52 fQRS patients.

Group II; 22) non fQRS patients. All data were analyzed using SPSS10.

## 3. Results

fQRS compared to pathological Q wave and ischemic ST-segment depression respectively, had higher sensitivity (49.0% vs. 36.7% and 17.3%) specificity (92.00% vs. 78.2% and 80%), predictive value (45% vs. 39.2% and 35.9%) and accuracy (63.5% vs. 51.4% and 41.9%) for diagnosis of left anterior artery (LAD) lesion, more sensitivity (66.7% vs. 14.3% and 9.5%), more positive predictive value (77% vs. 50% and 22%) and more accuracy (85.1% vs. 71.6% and 64.8%) for diagnosis of left circumflex artery (LCX) lesions it was more sensitive (67.5% vs. 27.5% and 12.5%), had higher positive predictive value (90% vs. 73.3% and 38.5%), more negative predictive value (70.5% vs. 58% and 42.6%) ( $p=0.003$ ) and more accuracy (78.4% vs. 55.4% and 41.9%) for diagnosis of right coronary artery (RCA) lesions  $p < 0.05$ .

## 4. Discussion

In our study, there were no differences between groups regarding the angiographic findings, in agreement with Guo et al.,<sup>2</sup> & Ari et al.,<sup>3</sup> except for 70–90% stenosis.

We are in agreement to the results of the previous studies<sup>2–5</sup> that the presence of fQRS had the upper hand on prediction of significant CAD in patients with ACS.

## 5. Conclusion

The presence of fQRS in ECG is a good, simple, applicable positive test to predict the presence of significant CAD in the Egyptian patient with ACS in the emergency room to decide

whether to be conscious and prepare the patients for PCI or not, even in those without enzyme elevation.

### Conflict of interest

Authors have no conflict of interest to declare.

### References

1. Basaran Y, Tigen K, Karaahmet T, et al. Fragmented QRS complexes are associated with cardiac fibrosis and significant intra ventricular systolic dyssynchrony in non ischemic dilated cardiomyopathy patients with a narrow QRS interval. *Echocardiography*. 2011;28(1):62–68.
2. Guo R, Li Y, Xu Y, Tang K, Li W. Significance of fragmented QRS complexes for identifying culprit lesions in patients with non-ST-elevation myocardial infarction: a single-center, retrospective analysis of 183 cases. *BMC Cardiovasc Disord*. 2012;19(12).
3. Ari H, Cetinkaya S, Ari S, Koca V, Bozat T. The prognostic significance of a fragmented QRS complex after primary percutaneous coronary intervention. *Heart Vessels*. 2012;27(1):20–28.
4. Das MK, Zipes DP. Fragmented QRS: a predictor of mortality and sudden cardiac death. *Heart Rhythm*. 2009;6(3):S8–14.
5. Das MK, Michael MA, Suradi H, et al. Usefulness of fragmented QRS on a 12-lead electrocardiogram in acute coronary syndrome for predicting mortality. *Am J Cardiol*. 2009;104(12):1631–1637.

Ibtesam Ibrahim El-Dosouky\*

Hala Gouda Abomandour

Cardiology Department, Faculty of Medicine, Zagazig University,  
44519, Egypt

\* Corresponding author.

E-mail addresses: [ibtesamaldosoky@yahoo.com](mailto:ibtesamaldosoky@yahoo.com) (I. El-Dosouky),  
[halamohammed5@yahoo.com](mailto:halamohammed5@yahoo.com) (H. Abomandour).

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