Original Research Paper

Cardiology

ANTERIOR WALL MYOCARDIAL INFARCTION WITH CONDUCTION DEFECT AND IT'S OUTCOME DURING HOSPITAL STAY

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ABSTRACT

BACKGROUND: Qrbb myocardial infarction has high mortality and morbidity. So we want to study in hospital outcome of qrbbb myocardial infarction

METHODS: It is a prospective study. We studied qrbbb mi patients admitted in our hospital from December 2016 to June 2017

RESULTS: About 90% of patients had heart failure. And 80% of patients required ventilatory support in the form of non-invasive positive pressure ventilation (NIPPV) or invasive ventilation. About 37% of patients had ventricular arrhythmias. Thrombolysis with streptokinase was done in 64% of patients and with tenecteplase for 20% of the patients. Percutaneous transluminal coronary angioplasty (PTCA) was done in 47% patients. Two patients had pharmacoinvasive PTCA. 16% of patients were conservatively treated due to late presentation. 24% patients died during hospital stay while 76% got discharged. 14% of patients had reversal of rbbb wave. 14% had stent thrombosis. 100% of patients had left anterior descending artery (LAD) disease. While 10% had left main coronary artery disease and 14% had triple vessel disease (TVD), 10% were sent for coronary artery bypass grafting (CABG).

CONCLUSIONS: qRBBB AWMI carries high mortality of 24% with 90% of patients going in to heart failure. Ejection fraction is a good predictor of death and diabetes is a covariate of predictor of death.

KEYWORDS : anterior wall mi, conduction block, CAD outcome.

INTRODUCTION

The prevalence of right bundle branch block (RBBB) in the setting of acute myocardial infarction (MI) ranges from 1.6% to 10.9% (about 3–29% in pre-thrombolytic era).

The conduction system of heart is supplied by the anterior interventricular branch of left coronary artery[8]. The presence of qRBBB is known to be associated with higher mortality rate [9-11]. Many studies, especially in the pre-thrombolytic era, associated the presence of RBBB in presence of MI with higher mortality. The analysis of HERO-2 trial elegantly demonstrated that in the setting of acute coronary syndrome, presence of RBBB whatever the onset, is associated with high risk of death.

The mortality rate in the south Indian perspective has been studied only farcely. This study was done to correlate between various risk factors and in hospital mortality in patients with qRBBB myocardial infarction.

METHODS
2.1 Study population:

Between December 2016 and June 2017, 330 patients with MI were admitted to our hospital. Out of them 168 had anterior wall MI and 30 had qRBBB in ECG.

The *criteria* for diagnosing Acute MI were
1) ongoing chest pain anginal nature >30mins
2) ECG showing significant ST segment elevation in anterior leads (V1-V4)
3) increase in CK-MB, Troponin I ,T .

Reinfarction was defined by the recurrence of persistent ischemic chest pain followed by at least two-fold re-elevation of CK-MB from the last measured value.

3. TREATMENT PROTOCOL:

Patients who presented within window period i.e, within 12hours were Thrombolysed with streptokinase or tenectiplase and if the patient had not reached in time for reperfusion therapy patients were put in inj. heparin and antiplatelets-aspirin and clopidogrel. patients who develops pulmonary edema were put on NPPV. Patients admitted in ICU and observed for 48 hours.

3.1 Percutaneous coronary intervention:

PTCA was done after getting consent. PTCA was done if the artery has more than 70% lesion considering the individual patient factors. Inj heparin given to all patients. If there is high thrombus burden, patient is treated with inj Tirofiban. Patients who underwent PCI were put on aspirin and twice a day dosing of clopidogrel.

4. RESULTS:

4.1 Incidence of qRBBB:
Of the 330 patients 168(50.9%) had anterior wall MI. Out of the 168 patients with Anterior wall MI,30 had qRBBB (17.8%). 14% had reversal of RBBB waves.
4.2 Age and Sex:
Out of the 30 patients with qRBBB MI, 66% were aged more than 50 yrs and 90% were males.
4.3 Duration of pain:
The duration was highly variable ranging from 1 hour to 7 days.
4.4 Time of contact to medical help:
The average duration was 6.2 hrs.
4.5 Comorbidities:
46.6% patients were diabetic and 10% were hypertensives.
4.6 Addiction:
70% of patients were smokers and 16% were alcoholics.
4.7 Length of stay:
Average duration of hospital stay was 11.4 days, while compared to 5 days which was the average duration of hospital stay for MI patients in western population.
4.8 TIMI score:
Average score at the time of presentation was 5/14.
4.9 Killip score:
Average score at the time of presentation was 3/4.
4.10 VSR:
Ventricular septal rupture developed in 1 patient.
4.11 Complete heart block:
Complete heart block developed in 4 patients in whom TPI was done.
4.12 Non-cardiac complications:
1 patient developed ventilator associated pneumonia; 3 patients developed hyponatremia induced metabolic encephalopathy; 1 patient developed massive haemoptysis.
4.13 Reperfusion therapy:
Out of the total 30 patients, CAG was done in 60% of patients. Of the remaining 12 patients , 7 patients improved clinically and treated conservatively . 7 patients expired of which 5 patient's attenders were not willing for invasive procedure and hence CAG deferred.

All patients with qRBBB had Left anterior descending artery disease. While 10% had left main coronary artery (LMCA) occlusion and 14% had triple vessel disease (TVD), 10% were sent for coronary artery bypass grafting (CABG).

Out of the 18 patients in whom CAG was done, PCI was done in 14 patients. Of the remaining 4, 1 had minimal disease and 3 patients had LMCA disease who were sent for CABG.

Thrombolysis with streptokinase was done in 64% of patients and with tenecteplase for 20% of the patients. Percutaneous transluminal coronary angioplasty (PTCA) was done in 47% patients. Two patients had pharmacoinvasive PTCA. 16% of patients were conservatively treated due to late presentation. 14% had stent thrombosis.

To conclude, inspite of qRBBB being such a challenging disease in itself, there are many practical difficulties which further increase the mortality rates.

4.14 Follow up:
About 90% of patients had heart failure. And 80% of patients required ventilatory support in the form of non-invasive positive pressure ventilation (NIPPV) or invasive ventilation. About 37% of patients had ventricular arrhythmias. 24% patients had died during hospital stay while 76% got discharged. 14% of patients had reversal of RBBB wave.

5. STATISTICAL ANALYSIS:

What predicts death?
- EF is a significant predictor of death. Increase EF decreases death
- Diabetes seems to be the important covariate in predicting death.
- R Square denotes how much of variation is explained? (70.28%). Adjusted R square controls for addition of variables: more useful variables are added more the adjusted R square.

	Estimate std.	Error t	Value	Pr(>l t l)
(Intercept)	3.715702	1.269563	2.927	0.0110*
Sex	0.034595	0.271117	0.128	0.9003
Age	0.219035	0.227753	0.962	0.3525
HT	-0.005214	0.278267	-0.019	0.9853
DM	0.331199	0.221360	1.496	0.1568
Smoking	-0.238192	0.220772	-1.079	0.2989
Alcohol	0.196052	0.287676	0.682	0.5067
PCI	-0.274162	0.180868	-1.516	0.1518
TNK	-0.859037	0.460185	-1.867	0.0830
SK	-1.028729	0.529831	-1.942	0.0726
NT	-1.359647	0.600011	-2.266	0.0398*
CCf	-0.488430	0.496999	-0.983	0.3424
QRBB	-0.394461	0.235613	-1.674	0.1163
Stay	-0.011780	0.009329	-1.263	0.2273
Ef	-4.346988	1.635019	-2.659	0.0187*
Kilip	-0.025596	0.084002	-0.305	0.7651

What predicts QRBB reversal?

- No factor predicts qRBBB reversal. Age seems to be the only factor close to significance

	Estimate std	Error t	Value	Pr(>l t l)
(Intercept)	1.168899	1.382007	0.846	0.410
Sex	0.158282	0.294737	0.537	0.599
Age	-0.320147	0.22662	-1.412	0.177
HT	-0.276244	0.297465	-0.929	0.367
DM	0.021411	0.245157	0.087	0.931
Smoking	0.008104	0.245602	0.033	0.974
alcohol	-0.008104	0.173968	-0.028	0.978
PCI	-0.066171	0.173968	-0.380	0.709
TNK	0.064890	0.500616	0.130	0.0898
SK	-0.2202219	0.569530	0.387	0.704
NT	0.042207	0.642410	0.066	0.948
CCF	-0.624138	0.525527	-1.188	0.252
EF	-1.790215	1.751139	-1.022	0.322
KILIP	0.026757	0.093014	0.288	0.777

What predicts Congestive cardiac failure?

Age, alcohol are significant predictors of ccf. EF and Kilip are also close to significance

|	ESTIMATE STD	ERROR T	VALUE	Pr(>l t l)
(Intercept)	1.83912	0.45589	4.034	0.000861***
Sex	-0.04296	0.13562	-0.317	0.755275
Age	0.19771	0.09297	20127	0.048400*
Ht	-0.17118	0.13085	-1.308	0.208233
Dm	0.11724	0.10951	1.071	0.299314
Smoking	-0.21262	0.10094	-2.106	0.050324
Alcohol	-0.32777	0.10790	-3.038	0.007432**
PCI	-0.04499	0.07954	-0.566	0.579041
TNK	-0.01288	0.23102	-0.056	0.956201
SK	0.04893	0.26258	0.186	0.854382
NT	-0.26381	0.28949	-0.911	0.374892
EF	-1.35128	0.73873	-1.829	0.084969
KILLIP	-0.06625	0.03981	-1.664	0.114349
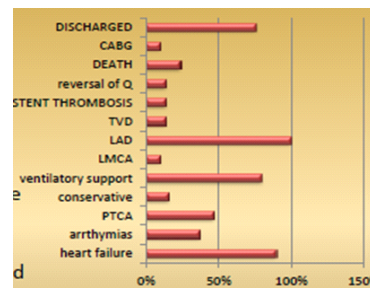
DISCUSSION

For many years it has been acknowledged that right bundle-branch block does not alter the direction of the early QRS forces. This depends on the fact that septal activation takes off from the left septal surface because of earlier arrival of the impulse coming down the left bundle-branch. Accordingly, Q waves tend to disappear in left bundle-branch block, and do not change (or do not occur if previously absent) in right bundle-branch block. Though disputed by some, the many cases of intermittent right bundle-branch block and left bundle-branch block reported by various authors, show this mechanism to be true under a wide variety of clinical conditions. initial R waves in VI and V2 were present during normal conduction but not during right bundle-branch block, suggesting that they represented activation of part of the heart "served" by the right bundle-branch, probably the thin anterior wall of the right ventricle.

It's Postulated that a transmural septal infarction cancelled out the normal septal force and made it possible for a small normally ineffectual electrical force of right ventricular origin to become apparent as a small R wave in V1 and V2, and that right ventricular infarction would make this phenomenon less likely to occur. This hypothesis is supported by the fact that in our three patients who were examined at necropsy septal infarction was transmural and right ventricular involvement was absent, and by the evidence that anteroseptal infarcts usually fail to extend to the right ventricle. Under such conditions, the abnormal Q waves in VI and V2 may only occur if right bundle-branch block is present.

An alternative explanation would be a transient myocardial injury causing both the right bundle branch block and the Q waves. In fact, it has been reported that Q waves may occur only transiently during acute episodes of coronary insufficiency.
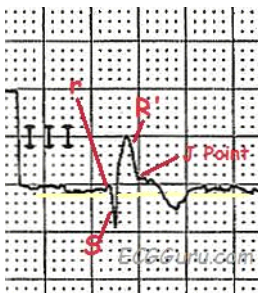
A normally activated right ventricle is a necessary condition for the occurrence of initial R waves in Vl and V2 in the presence of a transmural septal infarction and, as a consequence, for the occurrence of right bundle-branch block dependent Q waves.

Presence of QRBBB in the setting of acute coronary syndrome implicates patient is in high risk category. Culprit artery in RBBB with ACS is LAD proximal lesion hence the lower level of LVEF and higher Killip class.

LV dysfunction is to be expected after an acute MI. The degree of dysfunction correlates with the extent and location of myocardial injury. Non-infarcted myocardium can also become temporarily hypokinetic or akinetic due to ischemic "stunning." Patients with small, more distal infarctions may have discrete regional wall motion abnormalities with preserved overall LV function because of compensatory hyperkinesis of the unaffected segments. Prior MI, older age, female gender, diabetes, and anterior infarction are risk factors for development of cardiogenic shock

EF is a significant predictor of death in this study. Low EF increases mortality.

Diabetes seems to be the important covariate in predicting death. Patients with diabetes have more multivessel, diffuse and distal coronary disease, smaller reference vessels, poorer coronary collateral circulation and more left main stem disease. more plaque ulceration and intracoronary thrombus was observed in diabetic arteries than in those without diabetes. These features in combination with upregulated glycoprotein IIb/IIIa receptors, inflammation and endothelial dysfunction, make these patients particularly vulnerable to the atherosclerotic process and its sequelae.

No factor predicts rbbb reversal. Age seems to be the only factor close to its significance. Younger patients has higher incidence of reversal of RBBB .

Patients with CHF complicating acute Anterior MI have more unfavourable demographic and clinical characteristics on admission, higher rate of in-hospital complications and mortality.
Age, alcohol are significant predictors of Congestive cardiac failure. EF and Killip class are also close to its significance.

CONCLUSION

qRBBB AWMI carries high mortality of 24% with 90% of patients going in to heart failure. Ejection fraction is a good predictor of death and diabetes is a covariate of predictor of death. No factor predicts RBBB reversal. Age seems to be the only factor close to significance. Younger patients have high chance for reversal of RBBB . Reversal of RBBB has good outcome.,

EF is a significant predictor of death. Low EF has high mortality. Diabetes as a co factor seems to be the important covariate in predicting death. Age, alcohol are significant predictors of ccf.

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