

Case Report

A case of resolution of inferior wall myocardial infarction and varying degrees of atrioventricular block: a case report

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ABSTRACT

Inferior wall myocardial infarction (IWMI) complicating with high degree atrioventricular (AV) block had been a subject of discussion for a long time. Also the transient nature of these AV blocks in the presence of IWMI is well known to us. However our case presented with IWMI with right ventricular MI (RVMI) and in complete heart block and subsequently post thrombolysis developed varying degrees of AV block and reverted back to sinus rhythm. We found it as an incidence not much reported and thus reporting the case herewith.

Keywords: Inferior wall myocardial infarction, Right ventricular myocardial infarction, Complete / first degree / high degree / second degree atrioventricular block / post thrombolysis

INTRODUCTION

A 55 years old male presented to the emergency department with complaint of chest pain. On evaluation found to have IWMI, RVMI, anteroseptal MI and was in complete heart block. Inj. atropine was initially given and was subsequently thrombolysed with infusion streptokinase. Post thrombolysis the ECG changes of MI settled and the complete heart block reverted to Mobitz type II heart block. He was kept on continuous cardiac monitoring. On further observation, it reverted to first degree AV block and finally reverted back to sinus rhythm within 24 hours post thrombolysis. His past history did not reveal any significant risk factors related to coronary artery disease except for chronic smoking. He was symptomatically stable at the time of discharge.

CASE REPORT

A 55 years old male presented to the emergency department with complaint of retrosternal chest pain within 3 hours of the onset of pain in the noon of January.

History was suggestive of the ischemic nature of chest pain. Prior history was not significant for the related risk factors as hypertension, diabetes, dyslipidemia, family history of MI; except he was smoking excessively for a long duration. Physical examination showed pulse rate 46/minute, blood pressure 100/60 mmHg. Other systemic findings were within normal limit. Admission ECG showed ST segment elevation in II, III, aVF, V1 – V4, V2R – V6R with complete heart block pattern (Figure 1 and 2). Posterior wall ECG did not showed any significant finding. With cardiac enzyme markers as troponin T as positive and CKMB in the higher range, he was diagnosed as acute coronary syndrome – IWMI, RVMI, anteroseptal MI with complete heart block.

Since the presentation was within the window period of around 3 hours, thrombolysis with streptokinase was planned after giving loading dosage of antiplatelet and statins. Inj atropine 0.6 mg was given prior to thrombolysis. During the streptokinase infusion for over 60 minutes, the patient remained stable and was under continuous cardiac monitoring. After 60 minutes of starting streptokinase infusion, ECG showed resolution of

ST segment elevation in V1 – V4 with Mobitz type II heart block (Figure 3). The patient was further followed up and ECG was taken at 90 minutes of starting streptokinase that showed further resolution in ST segment elevation in II, III, and aVF with first degree AV block (Figure 4). Since significant resolution in the ECG was noted and patient being symptomatically better with vitals as stable, he was further followed up conservatively. ECG was repeated at 4 hours of starting streptokinase that showed almost complete resolution of ST segment elevation and sinus rhythm with heart rate 90/minute with very occasional premature ventricular ectopic (Figure 5).

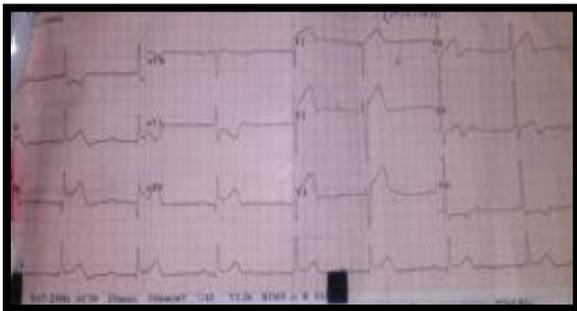


Figure 1: Electrocardiogram at admission showed IWMI, RVMI, complete heart block.

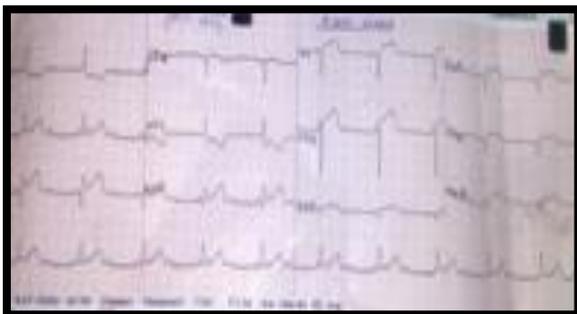


Figure 2: Electrocardiogram at admission showed ST segment elevation in V2R – V6R.



Figure 3: Electrocardiogram at 60 minutes showed Mobitz type II heart block.

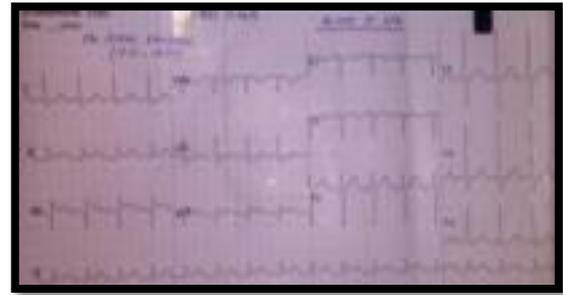


Figure 4: Electrocardiogram at 90 minutes showed first degree heart block.

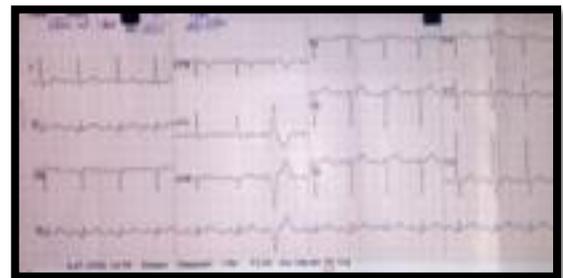


Figure 5: electrocardiogram after 4 hours showed complete resolution of ST segment elevation in sinus rhythm with normal heart rate.

The hematological and biochemical investigations were within normal range except for hypertriglyceridemia. Echocardiography showed inferior wall hypokinesia with moderately reduced left ventricle systolic function. He was further referred to the higher cardiac center for coronary angiography and further management, as ours is a rural hospital setup.

DISCUSSION

IWMI is frequently reported to be complicated by AV block, of which high degree AV block are more commonly associated with higher incidence of complication and a higher mortality.² As per one report, the mean in-hospital mortality for patients with third degree AV block was 29%.³

Malla RR and Sayami A conducted a cross-sectional study of patient with IWMI with and without RVMI to compare in-hospital complications and mortality in both groups. They found in-hospital complications as cardiogenic shock, complete AV block and junctional rhythm were significantly higher in IWMI when associated with right ventricular infarction.⁴ Mavric in his study further assessed the patient in two groups as IWMI and RVMI with or without complete AV block in both the groups. They found that patients with IWMI associated with complete AV block had significantly higher mortality rates only in the presence of right ventricular infarction.⁵

Ramires JA et al. also found that AV block was more common in patients with IWMI associated with RVMI as compared to patients with isolated IWMI. However the mortality rate was similar in two groups. The study concluded that the infarction extension from inferior wall to the right ventricle may be related to the development of AV block but mortality is not increased.⁶

A number of studies have shown that a larger amount of myocardial necrosis to be present amongst patients with IWMI with high degree AV block.² The two most common explanations for the etiology for the heart block in IWMI are: 1. Interruption of blood flow to the AV node. 2. High vagal tone resulting from the Bezold – Jarisch reaction.

Further researches on the association of right ventricular infarction and high degree AV block with large myocardial lesions suggested that factors other than the above mentioned must also play a role. Recently two new explanations have been proposed: 1. Role of intracellular electrolytes and metabolites (potassium and adenosine) that are released from the ischemic cells, 2. Collateral blood flow to the AV node.³

Dan Feigel, in his study, found that in early AV block (presenting within 6 hours of the first sign of infarction) atropine either abolished AV block completely or caused a marked acceleration of ventricular escape rhythm. The probable mechanism suggested for these groups of patient was increased vagal tone.¹

TIMI II trial compared the mortality amongst patient thrombolized with IV recombinant tissue-type plasminogen activator (rtPA) and from pooled data from prior the thrombolytic era. The study showed the relative high risk of mortality amongst both group. Thus presently no direct evidence is present that thrombolytic therapy is of particular benefit in this group of patient.⁷

Our case also presented similarly with IWMI with right ventricular infarction and in complete AV block and therefore was in high risk for in-hospital mortality. But post thrombolysis and with continuous cardiac monitoring our case showed good resolution in the ECG changes related to myocardial infarction and also the complete AV block got reverted to sinus rhythm without the need of pacemaker implantation. There are very few reported cases with this combination of presentation as to our knowledge. One of the reasons for the high mortality rate in patients with IWMI with RVMI and with complete AV block was suggested by Mavric Z to be the consequence of greater infarct size.⁵

CONCLUSION

Patient with IWMI, RVMI complicated by high degree AV block have worse prognosis. But the pattern of resolution, as seen in our case, from high degree AV block to first degree AV block and reverting back to sinus rhythm after thrombolytic therapy suggest us that conservative management and strict continuous cardiac monitoring can be the only required management. This may be particularly effective for this group of patient without the need of pacemaker as well as applicable in rural hospital setup.

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Ethical approval: Not required

REFERENCES

1. Dan Feigel, Jacob Ashkenazy, Yehezkiel. Early and late atrioventricular block in acute inferior myocardial infarction. JACC. 1984;4(1):35-8.
2. Berger PB, Ryan TJ. Inferior myocardial infarction – high risk subgroups. Circulation. 1990;81:401-411.
3. Gupta PK, Lichstein E, Chadda KD. Heart block complicating acute inferior wall myocardial infarction. Chest. 1976;69(5):599-604.
4. Malla RR, Sayami A. In hospital complications and mortality of patients of inferior wall myocardial infarction with right ventricular infarction. JNMA J Nepal Med Assoc. 2007;46(167):99-102.
5. Mavric Z, Zaputovic L, Matana A, Kucic J, Roje J, Marinovic D et al. Prognostic significance of complete atrioventricular block in patients with acute inferior myocardial infarction with and without right ventricular involvement. Am Heart J. 1990;119(4):823-8.
6. Ramires JA, Solimene MC, Savioli RM, Grandini Junior L, Cesar LA, da Luz PL et al. Mortality is not increased with inferior infarction associated with RV infarction and AV block. Coron Artery Dis. 1993;4(11):965-70.
7. Berger PB, Ruocco NA, Jacob AK, Ryan TJ: Increased mortality associated with heart block during inferior infarction: Results from TIMI II. Circulation. 1989;80(suppl II):347.

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