

CLINICAL AND ANGIOGRAPHIC PROFILE OF PATIENTS WITH COMPLETE HEART BLOCKKavya Pingali¹, Adikesava Naidu Otikunta², Y. V. Subba Reddy³, Ravi Srinivas⁴¹Resident, Department of Cardiology, Government General Hospital, Guntur, Andhra Pradesh.²Associate Professor, Department of Cardiology, Osmania General Hospital and Osmania Medical College, Hyderabad.³Professor and HOD, Department of Cardiology, Osmania General Hospital and Osmania Medical College, Hyderabad.⁴Assistant Professor, Department of Cardiology, Osmania General Hospital and Osmania Medical College, Hyderabad.**ABSTRACT****BACKGROUND**

The angiographic findings and prognosis of patients with Complete Heart Block (CHB) remain unclear. Thus, we aimed to study the clinical profile, risk factors, angiographic distribution and in-hospital outcomes of patients with complete heart block.

MATERIALS AND METHODS

This was a prospective, single-centred study which included 100 patients who came to the emergency department with CHB. Routine blood investigations including serum electrolytes were done. Coronary angiogram was done and lesions were assessed. Temporary pacemaker was implanted followed by permanent pacemakers in required patients, and in-hospital complications were noted down.

RESULTS

Commonest age group was above 60 years (75%). The patients were predominantly males. Most common presentation was chest pain (60%); there was regional wall motion abnormality in 30% patients. Degenerative complete heart block was seen in 34% patients, diphtheric myocarditis in 15%, hypokalaemic in 15%, dilated cardiomyopathy in 2%. Of total 53 patients had AV block, 14 had bifascicular block, 23 had LBBB, 6 had RBBB, 3 had Mobitz I and 1 had Mobitz II. Inferior wall myocardial infarction (MI) was pervasively present in patients. Temporary pacemakers were implanted in 6 patients and permanent pacemakers in 43 patients. In-hospital outcomes constituted of complication like cardiogenic shock (10%) and death (26%). The patients who died either had 80% -90% stenosis in RCA, triple vessel disease, ostioproximal LAD occlusion or diphtheric myocarditis.

CONCLUSION

Complete heart block was majorly associated with advanced age and inferior wall MI, virtually caused by dominant RCA occlusion. The in-hospital mortality was significantly higher in the patients with CHB.

KEYWORDS

Atrioventricular Block, Coronary Angiography, Myocardial Infarction, Pacemaker.

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BACKGROUND

Complete Heart Block (CHB) also known as the complete Atrioventricular (AV) block, is the interruption in the transmission of the impulse that is originated from SA node in the atria to the ventricles, either due to an anatomical or functional impairment in the AV conduction system.¹ The global prevalence of CHB has been reported to be 0.04%.² The Bundle Branch Block (BBB) in association with complete AV block is generally present in 1.7% patients; of these 1.1% have right BBB, 0.2% left BBB and about 0.2% have bifascicular block.³ The common presenting

symptoms have been hypotension, bradycardia and haemodynamic instability. Electrocardiographic examination assists the diagnosis of CHB, pertaining to various features like atrial rate, ventricular rate, degree of variation of both atrial and ventricular rates, presence or absence of changing block and width of the QRS.⁴

Normally, the AV node receives blood from either dominant Right Coronary Artery (RCA) or Left Circumflex Artery (LCX) and Left Anterior Descending (LAD) artery.⁵ Moreover, usually the damage in AV node or his bundle is not due to the abnormality in proper AV node, but more probably due to obstruction in arteries that supply blood to AV node. The obstruction is mainly due to pre-nodal atrial myocardial necrosis or large areas of infarction.⁶ Therefore, the presence of CHB is usually allied with the occurrence of Myocardial Infarction (MI). Previous studies have reported that about 4% to 7% of in-hospital patients with acute MI have been likely to develop CHB.⁷⁻⁹ Moreover, CHB had been independently related with an escalated risk of in-hospital mortality for acute MI and also with the occurrence of heart failure, cardiogenic shock and atrial fibrillation.¹⁰

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The determination of the actual cause of CHB and the underlying culprit artery would lead to improved prognosis of such patients. Therefore, the angiographic appraisal of CHB patients becomes crucial. Thus, we aimed to study the clinical profile, risk factors, angiographic distribution and in-hospital outcomes of patients with complete heart block.

MATERIALS AND METHODS

This was a prospective, single-centred study which included 100 patients who came to the Department of Cardiology with symptoms of complete heart block. Routine blood investigations including serum electrolytes were done. Coronary angiogram was performed and lesions were assessed. Temporary pacemaker was implanted followed by permanent pacemakers in patients who required its implantation and occurrence of any type of complications was noted down.

Continuous variables are presented as mean ± standard deviation and categorical variables are expressed as percentages.

RESULTS

Out of total 100 patients included in the study, the commonest age group was of patients above 60 years (75%). The patients were predominantly males. Most common presentation was chest pain (60%) followed by shortness of breath (30%) and giddiness (20%); 43% patients were known hypertensive. Table 1 outlines the baseline demographics and clinical presentation of patients included in the study. Blood pressure at the time of admission was 100/70 mmHg, mean heart rate was around 40 beats per minute, tachypnoea was observed in 5% patients. Auscultation creps were found in 5% patients, creatinine levels were elevated in 5%, hypokalaemia in 15%, echo showed regional wall motion abnormality in 30%. Severe and mild LV dysfunction was found in 15% and 12% patients and good LV function in 3%.

Degenerative CHB was seen in 34% patients, diphtheric myocarditis in 15%, hypokalaemic in 15%, dilated cardiomyopathy in 2% and congenital CHB in 1% patients. Of total 53 patients had AV block, 14 had bifascicular block, 23 had LBBB, 6 had RBBB, 3 had Mobitz I and 1 had Mobitz II. On Coronary angiogram, lesions were found in Right Coronary Artery (RCA) (41%), Left Anterior Descending Artery (LAD) (23%), Left Circumflex Artery (LCX) (23%), LCX and LAD (8%) and triple vessel disease (8%) (Table 2). Inferior Wall Myocardial Infarction (MI) was pervasively present in patients.

Temporary pacemakers were implanted in 6 patients and permanent pacemakers in 43 patients. In-hospital outcomes constituted of complication like cardiogenic shock (10%) and death (26%). The patients who died either had 80% -90% stenosis in RCA, triple vessel disease, ostio-proximal LAD occlusion or diphtheric myocarditis.

Patient Characteristics	N = 100
Age group	
>70 years, %	25%
60-70 years, %	50%
50-60 years, %	19%
40-50 years, %	6%
Symptoms	
Chest pain, %	60%
Dyspnoea, %	30%
Giddiness, %	20%
Altered sensorium, %	6%
Lowered blood pressure (mean, mmHg)	100/70
Risk factors	
Hypertension, %	43%
Diabetes, %	38%
Aetiology	
Degenerative complete heart block, %	34%
Hypokalaemia, %	15%
Dilated cardiomyopathy, %	2%
Diphthericmyocarditis, %	15%
Congenitalcomplete heart block, %	1%

Table 1. Baseline Demographics and Clinical Presentation of Patients with Complete Heart Block

Parameters	N = 100
Regional wall motion abnormality, %	30%
Severe LV dysfunction, %	15%
Mild LV dysfunction, %	12%
Good LV function, %	3%
Diseased vessels	
Right coronary artery, %	41%
Left anterior descending artery, %	23%
Left circumflex artery, %	23%
Normal coronaries, %	13%
Left circumflex and left anterior descending arteries, %	8%
Triple vessel disease, %	8%

Table 2. Echocardiography and Coronary Angiography Findings

DISCUSSION

In this study of 100 patients we assessed the clinical profile, risk factors, angiographic distribution and in-hospital outcomes of patients with complete heart block. The majority of patients were male and the common symptoms were chest pain, dyspnoea, giddiness and lowered blood pressure. Aetiologically, there was degenerative CHB in 34% patients, diphtheric myocarditis in 15%, hypokalaemic in 15%, dilated cardiomyopathy in 2% and congenital CHB in 1% patients. In accordance to our study, a previous study had reported that majority of patients with conduction abnormalities were male.³A previous study had stated that the symptoms associated with CHB were lower blood pressure and raised serum glucose levels.¹⁰ On angiographic examination of patients included in this study, RCA was found to be obstructed in most patients (41%) followed by LAD (23%) and LCX

(23%), thus there was pervasive occurrence of inferior wall MI in majority of patients. Moreover, 8% patients had diseased LAD and LCX (dual vessel disease) and 8% patients had triple vessel disease. In a recent study, Jim MH et al have observed that complete AV block occurred exclusively due to dominant RCA obstruction (95%) in the patients that were included in their study and 56% patients had multivessel disease. Moreover, they also stated that complete AV block complicated acute inferior wall MI in 12.7% of the patients.⁶ On contrary, Bassan et al have reported that involvement of LAD disease was more prevalent in patients who developed AV block.¹¹ In addition to this literature states that the anatomic location of AV block is of prognostic importance, such that CHB patients with anterior wall acute MI have a poorer prognosis than those with inferior wall acute MI.¹²

For the treatment of CHB in present study, temporary pacemakers were implanted in 6 patients and permanent pacemakers in 43 patients. The in-hospital outcomes constituted of complication like cardiogenic shock (10%) and death (26%). In another study insertion of temporary pacemaker was done in 38.6% patients, none of the patients had undergone permanent pacemaker implantation and the in-hospital mortality rate was 27.1%. Various complications were observed like re-infarction (8.6%), cardiac rupture (1.4%) and cardiogenic shock (15.7%).⁶ Similarly, Singh SM et al¹³ had included acute coronary syndrome patients with and without high-grade AV block. Temporary pacemaker was implanted in 35% patients and permanent pacemaker in 5.9% patients. The in-hospital death rate was 22.7% and cardiogenic shock was experienced by 23.3% patients. Literature suggests that temporary pacing has not been associated with decrease in in-hospital death, but indeed it increases two-fold risk of in-hospital death.¹³ However, the prognosis of patients following pacemaker implantation for isolated CHB is excellent.¹ The permanent pacemaker implantation has been found to be positively associated with in-hospital survival.¹³ Furthermore, Scott et al have demonstrated that in patients with moderately severe condition, mortality rate was reduced from 67% to 29% on treating patients with cardiac pacing.¹⁴ Thus, implantation of pacemaker lowers the death rate and also improves the quality of life of patients with CHB.

CONCLUSION

In light of the results, it can be concluded that complete heart block was majorly associated with advanced age and inferior wall MI, virtually caused by dominant RCA occlusion. The in-hospital mortality was significantly higher in the patients with CHB.

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