

# COMPLETE HEART BLOCK IN MALAYSIANS

KENNETH CHIN  
K. T. SINGHAM  
ANUAR MASDUKI

## INTRODUCTION

Atrioventricular block may occur in various acute and chronic diseases pertaining to the myocardium, or the structures surrounding, or in close proximity to the A-V node, bundle and bundle branches. When atrio-ventricular conduction is disrupted the ventricles are activated by distal pacemakers. Complete heart block usually results in some degree of cardiac insufficiency, manifested as a reduction in exercise tolerance, congestive heart failure, syncope or angina.

## MATERIALS AND METHODS

The clinical spectrum of complete heart block as seen in 100 patients studied at the University Hospital, Kuala Lumpur from 1971 to 1979 is reviewed. All patients with documented complete heart block were admitted to the coronary care unit for further monitoring and management. When temporary pacing was indicated, transvenous pacing was performed.

## RESULTS

### AGE, SEX AND RACIAL DISTRIBUTION

The ages of these patients ranged between 14 to 82 years with a peak incidence in the 51 to 60 years age group. There were 59 males and 41 females

with the male to female ratio at 1.4 : 1. The racial distribution showed 42 Chinese, 29 Malays, 27 Indians and 2 Caucasians.

### CLINICAL FEATURES

Common presenting symptoms were giddiness, syncope, chest pain and cardiac failure as shown in Table I. Nine patients had seizures while three had

TABLE I  
CLINICAL PRESENTATION IN COMPLETE HEART  
BLOCK

CLINICALS FEATURES	NO. OF PATIENTS
Syncope	55 (55%)
Giddiness	49 (49%)
Chest pain	39 (39%)
Cardiac failure	37 (37%)
Cardiogenic shock	8 ( 8%)
Seizures	9 ( 9%)
Fever, upper resp. tract infection	8 ( 8%)
Cerebrovascular accident	3 (3%)

cerebrovascular accidents. The heart rate ranged from 21 to 80 beats per minute with the majority (80 percent) below 50 beats per minute.

### AETIOLOGICAL FACTORS

The aetiology was unknown in 38 patients as shown in Table II. Where the aetiological factors could be determined, coronary artery disease was the commonest cause (40 percent) : 31 patients with acute myocardial infarction and 9 patients with angina pectoris. Of the 31 patients with acute myocardial infarction, 23 had inferior infarction, 5 anterior infarction and 3 had anterior and inferior infarction.

Five patients had congenital heart block. Three of the patients had associated congenital heart

---

Kenneth Chin, M.B.B.S., M.R.C.P.  
Dept. of Medicine,  
Universiti Kebangsaan Malaysia,  
Jalan Raja Muda,  
Kuala Lumpur, Malaysia.

K.T. Singham M.B.B.S., F.R.A.C.P., M.R.C.P.  
Anuar Masduki M.B.B.S., M.R.C.P.  
Department of Medicine,  
University of Malaya.

---

TABLE II  
AETIOLOGICAL FACTORS IN COMPLETE HEART  
BLOCK

AETIOLOGICAL FACTORS	NO. OF PATIENTS
Idiopathic	38 (38%)
Acute Myocardial Infarction	31 (31%)
Angina Pectoris	9 ( 9%)
Acute non-specific myocarditis	8 ( 8%)
Congenital heart block	5 ( 5%)
Thyrotoxicosis	2 ( 2%)
Congestive cardiomyopathy	2 ( 2%)
Giant cell myocarditis	1 ( 1%)
Hypertrophic cardiomyopathy	1 ( 1%)
Digoxin toxicity	1 ( 1%)
Pseudoxanthoma elasticum	1 ( 1%)
Scleroderma	1 ( 1%)

disease, one atrioventricular canal defect, one ostium primum atrial septal defect and one with ventricular septal defect.

Eight patients had acute nonspecific myocarditis. Some uncommon aetiological factors encountered were giant cell myocarditis, congestive cardiomyopathy, hypertrophic obstructive cardiomyopathy, pseudoxanthoma elasticum, scleroderma, and thyrotoxicosis.

#### MANAGEMENT

Symptomatic chronic complete heart block were initially treated with long acting isoprenaline (saventrine), and if this failed, they were paced. Temporary transvenous pacing was required in 74 patients and subsequent permanent pacing was performed on 45 patients. Thirteen patients were on long term medical therapy.

#### COURSE AND PROGNOSIS

Of the 100 patients reviewed, the complete heart block was reversible in 20 patients and irreversible in 61 patients, while 19 deaths were recorded.

The aetiological factors related to the 20 patients with reversible complete heart block showed that 16 patients had acute inferior myocardial infarction; 3 had acute nonspecific myocarditis and one patient had thyrotoxicosis. Fifteen patients had reversal of complete heart block within the first week of onset of the disorder while 2 patients recovered within the second week and the remaining 3 patients within the third week.

The majority of patients (60 percent) exhibiting irreversible complete heart block had an unknown

aetiology. Nine patients had angina pectoris while 2 patients had acute inferior myocardial infarction. There were 5 patients each with acute nonspecific myocarditis and congenital heart block while 2 patients had congestive cardiomyopathy and one had scleroderma.

The main cause of death in our patients was due to acute myocardial infarction (68 percent) with 5 anterior infarction, 5 inferior infarction and 3 anterior and inferior infarction.

#### DISCUSSION

The majority of the patients in our study fall in the 41 to 80 age group (68 percent) with the remaining third (32 percent) in the 21 to 40 age group. The average age of onset is 49.4 years.

In comparing age with aetiological factors, coronary artery disease was the main cause of complete heart block in patients above 40 years. In those patients below the age of 40, the causes were idiopathic, acute nonspecific myocarditis and congenital heart block. A comparable age aetiology relationship has been noted by Penton.<sup>1</sup>

Giddiness, syncope, cardiac failure and chest pain were the main presenting features in our patients as in most other surveys.<sup>1,2,3,4</sup>

Coronary artery disease was the commonest known aetiology factor and acute myocardial infarction was the commonest cause of death. The overall mortality rate for myocardial infarction is 41 percent out of 31 patients. Of the 23 patients with inferior myocardial infarction, the heart block was reversible in 16 patients and irreversible in 2 patients, with 5 deaths recorded. All the 5 patients with anterior myocardial infarction and 3 patients with anterior and inferior infarction died despite pacing. Complete heart block developing in the setting of acute myocardial infarction frequently is accompanied by other complications of infarction, especially congestive cardiac failure and cardiogenic shock. This combination results in an especially poor prognosis in our experience as with other authors.<sup>5,6,7,8,9</sup>

Complete heart block in acute nonspecific myocarditis had been reported to be an uncommon feature.<sup>10,11</sup> All our eight patients had preceding fever while six had upper respiratory tract infection, and three with cardiac failure and shock.

As far as we are aware, complete heart block has not been reported in pseudoxanthoma elasticum.

Our patient is a 51 year old Malay man who presented with recurrent syncopal attacks, breathlessness and bilateral ankle swelling. Increased skin folds and plaques were found in the inguinal and neck areas. Skin biopsy showed degeneration of elastic fibres with calcium deposition in the mid dermis and chronic inflammatory cell infiltration consistent with pseudoxanthoma elasticum.

Another rare cause of complete heart block is due to giant cell myocarditis.<sup>12</sup> The patient initially presented as a congestive cardiomyopathy but subsequently died of perforation of caecum and faecal peritonitis secondary to intestinal amoebiasis. Histology of the heart showed patchy replacement of the myocardium by collagen-rich fibrous tissue infiltration by lymphocytes and multinucleated giant cells. Similar lesions involved the sino-atrial node, atrioventricular node and conduction fibres.

Hypertrophic obstructive cardiomyopathy with complete heart block is also an uncommon association.<sup>13,14</sup> Thyrotoxicosis with complete heart block has been associated with acute infections.<sup>15,16,17</sup> Of our 2 patients with complete heart block and thyrotoxicosis, echo type 9 virus was isolated in one patient.

Atrioventricular conduction disorder is well associated with scleroderma, but complete heart block is however, uncommon.<sup>18,19,20</sup> Our patient with scleroderma is confirmed by skin biopsy which shows atrophic epidermis with loss of rete ridges.

## CONCLUSION

As has been borne out by our study the aetiology appears to relate to eventual prognosis of complete heart block. In patients with coronary artery disease, those with anterior infarction appear to have an extremely poor prognosis while those with inferior infarction tend to do well. In patients with acute nonspecific myocarditis, the prognosis appears to be extremely good with pacing. In those with specific aetiology, the prognosis appears to be determined by the underlying systemic disorder.

## REFERENCES

- <sup>1</sup> Penton G B, Miller H Levine S A. Some clinical features of complete heart block. *Circulation* 1956; 13: 801-824.
- <sup>2</sup> Rowe J C, White P D. Complete Heart Block. A follow-up study. *Amer. Heart J.* 1956; 52: 260-270.

- <sup>3</sup> Nair O V, Swan W G A. The Aetiology, Prognosis and treatment of complete heart block. *J. Indian Med. Assoc.* 1966; 46: 57-69.
- <sup>4</sup> Harris A, Davies M, Redwood D, Leatham A and Siddons H. Aetiology of chronic heart block. A clinicopathological correlation in 65 cases. *Br. Heart J.* 1969; 31 : 206-218.
- <sup>5</sup> Paulkj E A, Hurst J W. Complete heart block in acute myocardial infarction. *Amer. J. Cardiol.* 1966; 17 : 695-705.
- <sup>6</sup> Brown R W, Hunt D, Sloman J G. The natural history of atrioventricular conduction defects in acute myocardial infarction. *Amer. Heart J.* 78, 460-466.
- <sup>7</sup> Lassers B W, Julian D G. Artificial pacing in management of complete heart block complicating acute myocardial infarction. *Br. Med. J.* 2, 142-146.
- <sup>8</sup> Norris R M. Heart block in posterior and anterior myocardial infarction. *Br. Heart J.* 31, 352-356.
- <sup>9</sup> Donsono E, Lipski J. Current cardiovascular topics. Vol. IV. Acute Myocardial Infarction. Stratton Intercontinental Medical Book Corporation. New York, 1978, 1-9 - 181.
- <sup>10</sup> Lim C H, Toh C C S, Chia B L, Low L P. Stokes-Adams attacks due to acute nonspecific myocarditis. *Amer. Heart J.* 1975; 90, 172-178.
- <sup>11</sup> Kirmser R, Lembach R, Rowett D, Ross A. Complete heart block due to acute nonspecific carditis. *Chest* 1977; 71, 682-684.
- <sup>12</sup> Colljns J A H. Isolated granulomatous myocarditis, *Amer. Heart J.* 1959, 58, 630-632.
- <sup>13</sup> Matlof J H, Zener J C, Harrison D C. Idiopathic hypertrophic subaortic stenosis and heart block. *Amer. J. Cardiol.* 1973; 32, 719-722.
- <sup>14</sup> Gavrilesco S, Gavrilesco M, Streian C, and Luca C. Hypertrophic obstructive cardiomyopathy associated with complete heart block. *Acata Cardiol.* 1974, 29, 241-249.
- <sup>15</sup> Davis A C, Smith H L, Minn R. Complete heart block in hyperthyroidism following acute infections : A report of six cases with necropsy findings in one case. *Amer. Heart J.* 1933, 9, 81-85.
- <sup>16</sup> Stern M P, Jacobs R L, Duncan G W. Complete heart block complicating hyperthyroidism. *JAMA*, 1970; 212 : 2117-2119.
- <sup>17</sup> Kernoff L M, Rossouw J E, Kenelley B M. Complete heart block complicating thyrotoxicosis. *S. Afr. Med.* 1973; 47 : 513-516.
- <sup>18</sup> Escudero J, McDevitt E. The electrocardiogram in scleroderma analysis of 60 cases and review of the literature. *Am. Heart J.* 1958; 56, 846-849.
- <sup>19</sup> James T N. Coronary arteries and conduction system in scleroderma heart disease. *Circulation* 1974; 50, 844-856.
- <sup>20</sup> Lev. M, Landowne M, Matchar J C, Wagner J A. Systemic scleroderma with complete heart block. *Amer. Heart J.* 1966; 72, 13-24.