INDICATIONS OF TEMPORARY TRANSVENOUS PACING

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SUMMARY

A retrospective study of the indications for temporary transvenous pacing in the University Hospital, Kuala Lumpur, from 1971 to 1979 is reviewed. There were 111 patients. The main indications for temporary transvenous pacing were, namely, complete heart block (57%), sick sinus syndrome (24%), Mobitz type II block (5%) and bifascicular block (3%).

INTRODUCTION

Temporary transvenous endocardial pacing is a useful therapeutic modality in the coronary care unit. Since 1958, when Furman and Robinson[1] described the technique, the clinical indications for temporary transvenous pacing has been increasingly expanding. The recent indications include prophylactic pacing management of bradycardia and tachyarrhythmia,[4-6] and pacing to stabilise haemodynamics in severe congestive cardiac failure.[7,8]

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MATERIALS AND METHODS

The clinical records of all patients who required the insertion of a temporary transvenous pacemaker in the University Hospital, Kuala Lumpur, from 1971 to 1979 were reviewed. Multiple routes of insertion were used, including percutaneous subclavian or femoral vein puncture and antecubital cutdown. All temporary pacing were performed in the cardiac catheterization laboratory. Bipolar electrode catheters were used and operated in the demand mode. The catheter tip was positioned in the right ventricular apex under fluoroscopic control. The patients were thereafter monitored in the coronary care unit.

RESULTS

111 patients were reviewed. There were 64 male (58%) and 47 (42%) female patients. The male: female ratio is 1 . 4 : 1. There were 49 Chinese (44%), 33 Malay (30%), 27 Indian (24%) and two Caucasian patients. The ages ranged from 14 to 85 years, as illustrated in Figure 1.

The main indications for temporary pacing were complete heart block and sick sinus syndrome as shown in Table I. One patient had first degree heart block with cardiac failure, uncontrolled by medication.

The aetiological factors for complete heart block requiring temporary pacing, are shown in Table II. Coronary artery disease is the commonest cause (50%) of complete heart block requiring temporary

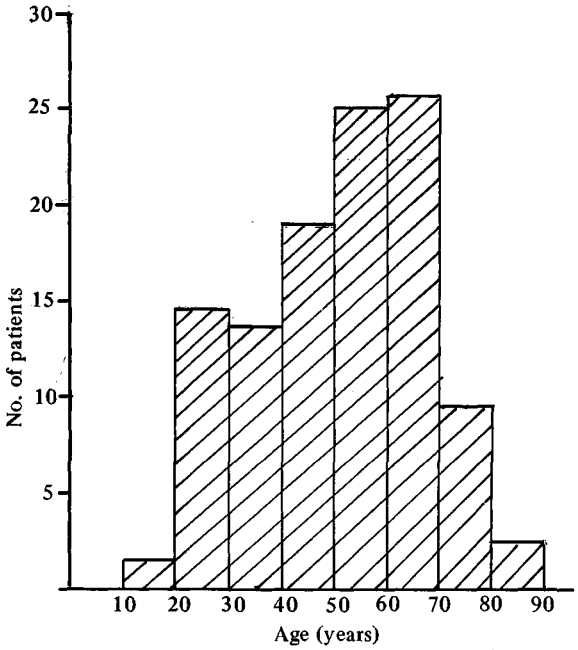

Fig. 1 Temporary transvenous pacing showing age distribution.

pacing. The other common aetiological factors are idiopathic complete heart block and acute nonspecific carditis.

Aetiological factors associated with Mobitz type II and bifascicular block are as shown in Table II. Patients with sick sinus syndrome were classified according to Rubenstein.[9] There were two patients with sinus bradycardia (type I), 15 patients with sinus arrest or sinoatrial block (type II), and 10 patients with tachycardiabradycardia syndrome (type III).

Common presenting symptoms were dizziness, syncope, chest pain and cardiac failure as shown in Table III. Ten patients had seizures, while five had cerebrovascular accident.

TABLE I
TEMPORARY TRANSVENOUS PACING

Indications	No. of Patients
Complete Heart Block	74 (67%)
Sick Sinus Syndrome	27 (24%)
Mobitz Type II Block	6 (5%)
Bifascicular Block	3 (3%)
First Degree Heart Block	1 (1%)
Total	111

TABLE II
TEMPORARY PACING
ADVANCED HEART BLOCK:
AETIOLOGICAL FACTORS

Aetiological Factors	No. of Patients
COMPLETE HEART BLOCK:	
Idiopathic	25 (34%)
Myocardial Infarction	31 (42%)
Angina	6 (8%)
Acute Nonspecific Carditis	9 (12%)
Thyrotoxicoses	1 (1%)
Pseudoxanthoma Elasticum	1 (1%)
Giant Cell Myocarditis	1 (1%)
MOBITZ TYPE II:	
Idiopathic	2
Acute Nonspecific Carditis	1
Inferior Infarct	3
BIFASCICULAR BLOCK:	
Inferior Infarct	1
Angina	1
Idiopathic	1

TABLE III
TEMPORARY TRANSVENOUS PACING:
CLINICAL PRESENTATION

Clinical Features	No. of Patients
Dizziness	67 (60%)
Syncope	67 (60%)
Chest Pain	40 (36%)
Cardiac Failure	30 (27%)
Fever (URTI)	11 (10%)
Seizures	10 (10%)
Palpitation	8 (7%)
Cardiogenic Shock	7 (6%)
Cerebrovascular Accident	5 (5%)

DISCUSSION

The majority of the patients requiring temporary pacing is in the 50 to 70 year age group as shown in figure 1. This age group comprised mainly of patients with coronary artery disease with complete heart block. In the 20 to 40 year age group, temporary pacing was performed predominantly in patients with sick

sinus syndrome. The age distribution in this study is quite in contrast to that reported by the Hynes *et al.*,[10] from the Mayo Clinic where only 7.5% patients were younger than 50-years-old.

In comparing age with aetiological factors in advanced heart block, coronary artery disease was the main cause of advanced heart block in patients above 40 years. In those patients below the age of 40, the causes were mainly idiopathic and acute nonspecific carditis. A comparable age aetiological relationship had been reported by Penton *et al.*,[11] Advanced heart block in acute nonspecific carditis had been reported to be an uncommon feature.[12-14]

As shown in Table I, the commonest indication for tempofary pacing is complete heart block (67%) while sick sinus syndrome accounts for another 24%. The ratio of temporary pacing for complete heart block to that of sick sinus syndrome is 2.7 : 1. A comparable ratio has been reported by other authors.[10,15] However, the pattern of indication of pacing has been progressively changing in other centres, with an increasing number of patients with sick sinus syndrome.[16]

Until about 1970, most physicians and surgeons would have considered carefully whether to implant a pacemaker in the absence of demonstrated Adams-Stokes seizures. Gradually a variety of minor neurologic lapses and prophylactic indications have become dominant.

The pharmacologic treatment of sinus arrest and syncope has been unstatisfactory.[17,18] The experience with sympathomimetic is that they increase the rate of a bradycardia but frequently produce a tachycardia.[9]

During complete heart block, cardiac function is markedly reduced, the ventricular rate is slow, usually between 30 to 40 per minute[19] with episodes of even slower rates or arrest. The cardiac output is reduced and is maintained by maximum stroke volume.[20] The arteriovenous oxygen difference is also increased.[21] Atrioventricular dissociation and asynchrony is associated with cyclical reduction of systemic and pulmonary pressures and outputs. Ventricular pacing ameliorates all the functional disturbances except the A – V dissociation.

Pacing is also indicated in lesser degree of fixed A – V block because of the possibility of intermittent complete heart block with asystole, and/or ventricular tachycardia and fibrillation and syncope or sudden death. Bifasicular block with right bundle branch block with left anterior[22] or left posterior hemi-block[23] is ominous, and require urgent pacing.

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