

INDICATIONS AND RISK FACTORS FOR PERMANENT PACING IN PATIENTS PRESENTING TO A SINGLE CARDIAC CENTRE IN PAKISTAN

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ABSTRACT

Background: Heart block to needs pacemaker implantation as management plan in emergency room. **Objective:** To determine the risk factors and indications for permanent pacing in patients presenting to a single cardiac center in Pakistan. **Methodology:** A cross sectional, single centered, study, was conducted from 1st September 2015 to 30th April 2017. A total of 213 patients with different conduction defects, who presented to Punjab Institute of cardiology were included in the study. Patients of either sex with different conduction defects were included in the study after fulfilling inclusion criteria. Prevalence rates were calculated and analyzed by age, sex, different types of conduction defects and conventional risk factors for selected population. Data was entered in SPSS 21 and analyzed. **Results:** A total number of 213 patients were included. Frequency of conduction defect was increasing with age was observed with maximum frequency (28%) noted between 61 to 70 years of age. Hypertension (38%) and diabetes (23%) were the leading risk factors with female predominance and smoking in males among conventional risk factors. Among conduction defects third degree heart block was frequent (75%) among studied population. **Conclusion:** Rates of pacemaker insertions are increasing with age. The results are inline with international registries. Most common indication was 3rd degree heart block and common conventional risk factors were hypertension and DM. It is the need of time to establish a registry in Pakistani population and to record their patterns of presentation.

Key Words: Conduction defects, Complete heart block, Syncope, Permanent pacemaker.

INTRODUCTION

Permanent pacemakers were developed in late fifties initially for complete heart blocks and to decrease mortality.¹ With continuous development in pacing technology permanent pacing has become treatment of choice for a number of electrical abnormalities.¹ In last two decades with this continuous development, we are moved from asynchronous to synchronous pacing resulting in improvement in hemodynamics and quality of life.² Conventional indications for permanent pacing include different kinds of atrioventricular conduction defects, symptomatic bradycardias and atrial fibrillation. New emerging indications like vasovagal syncope, dilated cardiomyopathy, hypertrophic obstructive cardiomyopathy and atrial fibrillation are easy to address with this new permanent pacing technology.³

Lack of conduction through atrioventricular node has many causes. Degenerative changes in atrioventricular node are considered the commonest non-ischemic cause of heart blocks. Degeneration may be caused by fibrosis, calcification or infiltration. Diseases including hemochromatosis, sarcoidosis, myxedema and progressive calcification of mitral and aortic annulus are infiltrative diseases, which can cause varying degrees of heart blocks.⁴

Myocardial ischemia is probably the second

commonest cause of atrioventricular blocks and is related to all the conventional risk factors which are considered risk factors for coronary artery disease. Conduction defects most commonly observed atrioventricular defects after acute myocardial infarction include first, second and third degree atrioventricular conduction defects, right or left bundle branch blocks and sometimes anterior or posterior fascicular blocks.⁵ Cause of these heart blocks is impaired blood supply either from atrioventricular nodal branch of right coronary artery or left circumflex artery or from septal branches of left anterior descending artery.⁶⁻⁷ As there is no such analysis available in Pakistani population regarding permanent pacemaker indications,^{8,9} so this study was conducted to assess conventional risk factors and indications of permanent pacemaker implantation.

METHODOLOGY

A cross-sectional, study was conducted from 1st September 2015 to 30th April 2017, on 213 patients with different types of atrioventricular blocks presenting to Punjab Institute of Cardiology, Lahore Pakistan. Patients of either sex with different indications of permanent pacing were included in the study after fulfilling inclusion criteria (based on symptoms and ECG findings). Informed consent was obtained from each patient or attendant.

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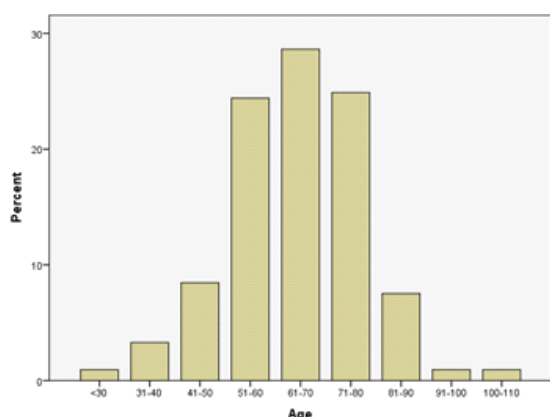
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Demographic details (age, sex,) were obtained. Data was entered and analyzed through SPSS 21. Quantitative variables like age were calculated as mean and standard deviation. Qualitative variables like gender, indications for pacing and risk factors were calculated as frequency and percentage. Ethical approval was sought from hospital ethical committee.

RESULTS

213 patients which presented with different indications of permanent pacemaker were included in the study after fulfilling inclusion criteria. Age distribution of patients showed that majority of patients which presented to hospital were between 51 to 90 years of age. (Figure: I)

Figure I: Age range of Population



Presence of conventional risk factors for ischemic heart disease was noted and hypertension (38.5%) followed by diabetes (23.5%) were at the top with female predominance. (Figure II)

Table I: Frequency of conventional risk factors and sex distribution among these patients. (n=181)

Conventional risk factors	Overall frequency	Male (92)	Female (89)
Diabetes	50 (23.5%)	20 (16.9%)	30 (31.6%)
Hypertension	82 (38.5%)	34 (28.8%)	48 (50.5%)
Smoking	41 (19.2%)	36 (30.5%)	5 (5.3%)
Family history	6 (2.8%)	2 (1.7%)	4 (4.2%)
Hypercholesterolemia	2 (0.9%)	0 (0.0%)	2 (2.1%)

Third degree heart block was most common indication among patients presented with heart blocks. (Table II)

Table II: Overall Indications of Pacemaker Insertion (n=213)

Overall Indications of Pacemaker Insertion	Indications of PPM Insertion	
	Indications of PPM Insertion in Males	Indications of PPM Insertion in Females
	No (%)	No (%)
Second degree	15 (7.0%)	6 (6.3%)
Third degree	160 (75.1%)	71 (74.7%)
Chronic Bifascicular	3 (1.4%)	1 (1.1%)
Chronic Trifascicular	1 (0.5%)	2 (2.2%)
Congenital CHB	3 (1.4%)	-
Sick Sinus Syndrome	12 (5.6%)	3 (3.2%)
Drug induced	19 (8.9%)	12 (12.6%)
Total	213 (100%)	95 (100)

DISCUSSION

Conduction defects can present in a variety of ways from asymptomatic to syncope and ventricular arrhythmia.⁹ Scientific societies repeatedly revise the indications for pacing and issued guidelines and recommendations to give maximum benefit to patients.¹⁰

In our study age with maximum incidence was 61-70 years which is quiet in line with UK and European registry.⁸ Aging is associated with increased incidence of arrhythmia and conduction disturbances.¹⁰ Although no Pakistani data is available on this subject.¹¹ Out of 213 patients who presented with different indications for permanent pacemaker implantation 118 patients were male and 95 were females and in both the groups third degree heart block was the leading cause of symptoms as in other international registries followed by second degree heart block, sick sinus syndrome and drug induced with least percentage of congenital heart blocks.¹²⁻¹⁴

The incidence of drug induced heart block was noted significantly high as compared to international registries which may be due to lack of awareness in our population from drug side effects as well as of primary physicians from new updates regarding hypertension management and use of beta blockers as first line therapy. Incidence was higher in females as compared to males although we lack statistical evidence on this issue in Pakistan.¹² Sick sinus syndrome observed more in male patients as compared to female patients. This observation is also in line with sweet dish international registry where female incidence is much higher. It is need of time to establish a registry in Pakistani population to study all these patterns of presentation.

Considering presence of conventional risk factors being an etiological base of complete heart block and other indications of permanent pace maker implantation, incidence of hypertension was highest among studied population followed by diabetes

mellitus, smoking, family history and hyperlipidemia. Female predominance was observed in hypertension and diabetes where as smoking being an important risk factor was observed more in males than in females.¹³ This data is concordant with international European registry data.⁷

CONCLUSION

This study showed that most common indication for pacemaker implantation was third degree heart block. And common conventional risk factors were, hypertension, diabetes mellitus and smoking. It is also need of the time to establish a registry in Pakistani population and also to study their patterns of presentation.

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