

Heart Block Necessitating Pacing At Iraqi Center For Heart Diseases. October 2011 – August 2013

Dr. Hassan Abdul Amir AL-Daghir

Consultant physician

M. B. CH. B, DM, C.A. B.M.

ABSTRACT:

We aimed at assessing the cases of H.B. at Iraqi center for heart diseases regarding their causes, management .

A cross – sectional study was conducted at Iraqi Center for Heart Disease – Baghdad / Iraq .We had studied 82 cases of H.B during the period from October 2011- August 2013 . We studied our cases according to base line characteristics, so also according to age groups, presetting features ,types of H.B, preceding manifestations and the drugs incriminated. Also we evaluated the cardiac biomarkers, the incidence of CHB, the need of performing exercise test ,electrolytes assessment ,renal function indices and type of implanted permanent pacemakers.

All of our cases were of white race and 43(52.43%) were males while female sex was reported in 39(47.56%) . Of our patients syncope was reported in 40(48.78%),. dizziness in 36(34.9%) .Impaired performance in 18(21.95%) and presyncope in 8(9.75%) of the patients . 3rd degree HB was reported in 47(57.31%) , SSS in 14(17.07%) mobitz 2 in 11(29.39%) , bifascicular in 5(6.09%) and bifascicular with prolonged PR interval in 2(2.43%) . As preceding illnesses hypertension was reported in 47(57.31%) , DM in 27(32.92%) , IHD in 20(24.39%), Rh.H.D in 4(4.87%) and autoimmune diseases in 3(3.65%). Diastolic dysfunction was reported in 27(32.92%) while systolic dysfunction in 9(10.27%). Temporary pacing was done in 70(85.36%) . CHB was reported in only one patient (1.21%) while familial HB had not been reported . Critical IHD had been seen in 20(24.39%) . Acute MI in one case (1.21%) only . Permanent pacemaker had been implanted in 74(90.24%) of patients .

The highest rates of HB had been shown in elderly patients and mostly of the white race. Sex has no an impact on the incidence of HB. Dizziness was a common presenting symptom. Most of events were insidious. The majority of our cases of H.B were of 3rd degree type. Ischemic heart diseases precede the event in about a quarter of our cases, also DM and hypertension are commonly preceding the occurrence of H.B. Drugs although rarely encountered as a cause of H.B in our series but should be taken into consideration. Congenital H.B was extremely rare and so also the familial type which had not be encountered in our cases. Temporary pacing as a bridge for permanent pacing was commonly used. Cardiac biomarkers were nearly normal in all our patients. Holter study showed AV block to be more common than SSS in those cases studied by this test. No need to perform treadmill test in most of our cases. CA is required to be

performed according to the recommended guidelines and I.H.D. was reported in a quarter of our cases. Acute MI was rare as a cause of H.B necessitating a permanent pacing.

KEYWORDS :

heart block (H.B), ischemic heart disease (IHD), rheumatic heart disease (Rh.H.D), diabetes mellitus (DM), sick sinus syndrome (SSS), coronary angiography (CA), atrioventricular (AV). congenital heart block (CHB). Myocardial infarction(MI)

INTRODUCTION:

Atrioventricular (AV) block is defined as a delay or interruption in the transmission of an impulse from the atria to the ventricles due to an anatomical or functional impairment in the conduction system. The conduction disturbance can be transient or permanent, and it can have many causes . Enhanced vagal tone due to sleep, athletic training, pain, carotid sinus massage, or hypersensitive carotid sinus syndrome can result in slowing of the sinus rate and/or the development of AV block.(1). Fibrosis and sclerosis of the conduction system accounts for about one-half of cases of AV block and may be induced by several different conditions which often cannot be distinguished clinically. Progressive cardiac conduction defects, referred to as Lenegre's or Lev's disease, are characterized by progressive impairment of the conduction system.(1).

Heart block can be caused by several conditions and certain medications. People can be born with the condition (congenital), or develop it over time (acquired)
(1).

First degree heart block(1) may found in long distance runners. Other causes include: myocarditis , (hypokalaemia) , (hypomagnesemia), (antiarrhythmics), such as disopyramide ,calcium channel blockers & digoxin .Second degree heart block(1). Can be found in athletes .Some children born withcongenital heart diseasecan also develop second degree heart block. Other causes include:Lyme disease, antihypertensive medications , amiodarone and pentamidine .

Third degree H.B. could be congenital or acquired(1) like complication of heart surgery,radiotherapy, cytotoxics, diphtheria,rheumaticfever& poorly controlled hypertension. Cancer that has spread from another part of the body into the heart . a penetrating trauma to the chest, such as a stab wound or gunshot wound & as a complication of radiofrequency ablation of the heart. Medications including: digoxin. calcium-channel blockers beta blockers . tricyclic antidepressants & clonidine (2) (3) (4).

In 3rd degree (AV) block there is [complete dissociation](#) of the atrial and ventricular activity. The ventricular escape mechanism can occur anywhere from the AVN to the bundle-branch Purkinje system. (5)

In some cases, acquired H.B. may go away if the factor causing it is treated or resolved. For example, H.B. that occurs after a heart attack or surgery may go away during recovery.(6)

PATIENTS AND METHODS:

A cross – sectional study was conducted at Iraqi Center for Heart Disease – Baghdad / Iraq .We had studied 82 cases of heart block during the period from October 2011- August 2013 . We studied our cases according to base line characteristics including age, sex , race , onset of

events , echo cardiographic evaluation regarding systolic and diastolic dysfunction ,temporary pacemaker implantation and coronary angiography .We also studied our cases according to age groups, presenting features ,types of heart block,preceding diseases and the drugs incriminated so also we evaluated the cardiac biomarkers, the incidenceof congenital heart block ,the need of performing exercise test ,electrolytes assessment ,renal function indices and Type Of Implanted Permanent Pacemakers.

RESULTS:

Regarding base line characteristics the results as in table 1, age groups as in table 2, presenting features as in table 3, : type of heart block as in table 4, preceding diseases as in table 5, drugs incriminated as in table 6 & type of implanted permanent pacemaker as in table 7,

DISCUSSION:

In our study we faced only one case of complete HB associated with acute extensive anterior MI. The patient had been treated by thrombolytic therapy in another hospital and then shifted to our center because of HB for the purpose of establishing a temporary pacing, however the patient went into a very rapid downhill course, getting collapsed, passing into cardiogenic shock and died. There is a study (7) Which confirmed the same idea above and accounted. That the decision to implant a permanent pacemaker for AV or intraventricular conduction block complicating AMI will depend on the type of conduction disturbance, location of the infarction, and relation of the electrical disturbance to infarct time. Thrombolytic therapy has decreased the incidence of high-grade AV block in AMI, but mortality remains high in this group of patients. The impact of preexisting bundle branch block on mortality after AMI is uncertain. However, left bundle branch block combined with advanced or thirddegree AV block and right bundle branch block combined with left anterior or left posterior fascicular block carry a particularly ominous prognosis.(7)

Not every case of complete HB needs a permanent pacing and in our study there were three cases, one of them was 2ry to hyperkalemia and the other were due to CCB and BB. Dealing with these things can correct the subject and obviate the need for pacing. This idea is confirmed by many studies (5) (8)

In which it is accounted that Initial triage of patients with complete heart block consists of determining symptoms, assessing vital signs, and looking for evidence of compromised peripheral perfusion. In particular, the physical examination findings of patients with third-degree AV block will be notable for bradycardia, which can be severe.

Treatment of third-degree AV block is based on the level of the block. The first, and sometimes most important, medical treatment for heart block is the withdrawal of any potentially aggravating or causative medications. Medical treatment of complete heart block is limited to patients with conduction disease in the AVN.

Initial treatment efforts should focus on assessing the need for temporary pacing and initiating the pacing. Most patients whose heart block is not otherwise treatable will require a permanent pacemaker or an implantable cardioverter defibrillator (ICD).

In our center there is no a facility to perform an electrophysiological study so as to clarify the real part of the PR that is prolonged whether the AH or HV interval and accordingly to establish a base for permanent pacing and this was one of the limitations of our study. The guidelines (9). Confirmed that symptomatic PR interval and the HV>65 msec to <than 100

msec. Is an indication for a permanent pacing so also the markedly prolonged HV interval >100 msec in an asymptomatic patients.

While in another study it is accounted that the PR and HV intervals have been identified as possible predictors of third-degree AV block and sudden death in the presence of underlying bifascicular block. However, the prolongation is often at the level of the AV node, and frequently there is no correlation between the PR and HV intervals and progression to third-degree AV block and incidence of sudden cardiac death. Some investigators have suggested that asymptomatic patients with bifascicular block and a prolonged HV interval (≥ 100 milliseconds) should be considered for permanent pacing. However, the incidence of progression to third-degree AV block is low, even in the setting of prolonged HV interval. Death is often not sudden or due to advanced AV block but rather due to the underlying heart disease itself and nonarrhythmic cardiac causes. (7).

Taking symptoms into consideration is very important in deciding to establish permanent pacing especially in 1st degree AV block and Mobitz 1. And this idea was affirmed in another study which stated that Patients with abnormalities of atrioventricular (AV) conduction may be asymptomatic or may experience serious symptoms related to bradycardia, ventricular arrhythmias, or both. Decisions about the need for a pacemaker are necessarily influenced by the presence or absence of symptoms that are directly attributable to bradycardia.

(7)

Also and in the same study it was stated that *nonrandomized* studies strongly suggest that permanent pacing improves survival in patients with third-degree AV block, particularly if syncope has occurred. It is now recognized that marked first-degree AV block can lead to symptoms even in the absence of higher degrees of AV conduction disturbance and may be associated with a "pseudopacemaker syndrome" because of close proximity of atrial systole to the preceding ventricular systole. Small *uncontrolled* trials have suggested some symptomatic and functional improvement with pacing in patients with PR intervals >0.30 second, especially those with left ventricular (LV) dysfunction, some of whom may benefit from dual-chamber pacing with short AV delay.(7)

In our study there was only one case out of the 82 which has congenital heart block and which had not been dealt with by permanent pacing although the patient was in her forties according to her doctor's opinion while the new trend now . Accounted that permanent pacing in children or adolescents is generally indicated in symptomatic sinus bradycardia, recurrent bradycardia-tachycardia syndromes, congenital AV block, and advanced second- or third-degree surgically induced or acquired AV block. Important differences between indications for permanent pacing in children and adults include age dependency of physiological heart rate and impact of residual ventricular dysfunction and abnormal circulatory physiology after surgical palliation of complex congenital cardiac defects(7).

In the same study it was added that the indications for permanent pacing in congenital third-degree AV block have evolved with some studies suggesting improved long-term survival and prevention of syncopal episodes in asymptomatic patients with congenital complete heart block who meet specific criteria.

Reasonable number of cases of sick sinus syndrome (SSS) had been seen in our series 14(17.07%) and sometimes there were combinations of both SSS plus AV block and whether SSS is found solely or in combination we must choose the best applicable type of pacemaker to get optimal benefit at the time of implant and for the future anticipation.

It was stated in one study that correlation of symptoms with arrhythmias resulting from sinus node dysfunction (eg, sinus bradycardia, sinus arrest, paroxysmal supraventricular tachycardia alternating with periods of bradycardia or even asystole) is essential in deciding whether a permanent pacemaker is indicated. This correlation may be difficult because of the intermittent nature of the episodes. Sinus node dysfunction may also express itself as chronotropic incompetence. Rate-responsive pacemakers have clinically benefited patients by restoring physiological heart rate during physical activity in this setting. (7) In the same study it was added that trained athletes may have a physiological sinus bradycardia of 40 to 50 bpm while awake and at rest and a sleeping heart rate as low as 30 bpm with sinus pauses producing asystolic intervals as long as 2.8 seconds. These findings are due to increased vagal tone and are not an indication for permanent pacing.(7) . And permanent pacing in patients with sinus node dysfunction will frequently relieve symptoms but may not necessarily result in improved survival. Whether dual-chamber pacing improves survival compared with ventricular pacing remains controversial. Multiple prospective trials are ongoing to assess the superiority of dual-chamber versus ventricular-based pacing systems in patients with sinus node dysfunction.(7)

We should emphasize that dizziness should be assessed correctly especially in elderly patients and not attributing this complaint to central nervous system pathology and prescribing symptomatic treatment while the patient having a serious cardiac problem which may causing a catastrophe one day. In our series it was shown that dizziness was reported in 36(34.9%) of our 82 cases. Permanent pacing had been done in 74 (90.24 %) patients and the types of pacemakers were as follow:

VVI	VVIR	DDDR	VDDR	DDD
17 (22.97 %)	19 (25.67 %)	24 (32.43 %)	4 (5.4 %)	10 (13.51 %)

Permanent pacing had not been done in 8 (9.75%) patients and the causes were as follow: hyperkalemia 2ry to advanced renal failure. sever gastro intestinal bleeding and death 2ry to carcinoma of the stomach. advanced renal failure + digoxine toxicity. sudden collapse, cardiogenic shock and asystole. patient's refusal. terminal state and family refusal. temporary HB 2ry to betablocker. temporary HB 2ry to calium channel blocker.

CONCLUSION:

The highest rates of HB had been shown in elderly patients and mostly of the white race. Sex has no an impact on the incidence of H.B. Dizziness was a common presenting symptom. Most of events were insidious. The majority of our cases of H.B were of 3rd degree type. Ischemic heart diseases precede the event in about a quarter of our cases, so also DM and hypertension are commonly preceding the occurrence of H.B. Drugs although rarely encountered as a cause of H.B in our series but should be taken into consideration. Congenital H.B was extremely rare and so also the familial type which had not be encountered in our cases. Temporary pacing as a bridge for permanent pacing was commonly used. Cardiac biomarkers were nearly normal in all our patients. Holter study showed AV block to be more common than SSS in those cases studied by this test. No need to perform treadmill test in most of our cases. CA is required to be performed according to the recommended guidelines

and I.H.D. was reported in a quarter of our cases. Acute MI was rare as a cause of H.B necessitating a permanent pacing.

STUDY LIMITATION:

We have no facility to perform an electrophysiological study in our center so as in cases of asymptomatic prolonged PR interval or Mobitz I 2nd. Degree H.B. We cannot know whether the block was in AV node or in bundle of his or below so as to take the decision of implanting a permanent pacemaker or not.

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Table 1 : base line characteristics

Age	Mean age 40-59 y s		
sex	Male 43(52.43%)	Female 39(47.56%)	
Race	White 100%	Black 0	
Onset of events	Sudden 17(20.73%)	Incidious 65(79.26%)	
Echo.dysfunction	Systolic 9(10.93%)	Diastotic 27(32.92%)	Combined 5(6.09%)
Coronary angio.	Cases studied 47	Normal CA 15(18.29%)	Critical lesion 20(24.39%)
Temporary pacing	Yes 70(85.36%)		No 12(14.63%)
Congenital HB	1(1.21%)		
Cardiac biomarkers TPT,TPI,CK-MB	Positive:1 (1.21%)		
Need for excercise test	Performed : 1(1.21%)		
Impaired renal function	1(1.21%)		
Electrolyte abnormalities	Hyperkalemia:1 (1.21)		

Table 2 : age groups

Age groups in years	Number of patients
1 - 9	0%
10 – 19	0%
20 – 29	4(4.87%)
30 – 39	0%
40 – 49	10(12.19%)
50 – 59	8(9.75%)
60 – 69	27(32.92%)
70 – 79	23(28.04%)
80 - 89	10(12.19%)

Table 3 : presenting features

complaint	frequency	complaint	frequency
Syncope	40(48.78%)	Presyncope	8(9.75%)
Dizziness	36(34.9%)	Dyspnoea	4(4.87%)
Impaired performance	18(21.95%)	Congestive H.F	1(1.21%)
Confusion	11(13.41%)		

Table 4 : Regarding the type of heart block we got the followings .

Type of block	frequency
3 rd degree	47(57.31%)
SSS	14(17.07%)
Mobitz 2	11(29.39%)
Bifascicular	5(6.09%)
Bifascicular + prolonged PR	2(2.43%)
LBBB + prolonged PR	1(1.21%)

Table 5 : Regarding the preceding diseases we got the followings .

Type of disease	frequency	Type of disease	frequency
Hypertension	47(57.31%)	DM	27(32.92%)
IHD	20(24.39%)	Rh.H.D	4(4.87%)
Autoimmune diseases	3(3.65%)	CRF	1(1.21%)
Heart surgery	1(1.21%)		

Table 6 : Regarding the drugs incriminated we got the followings .

drug	frequency	drug	frequency
Digoxine	4(4.87%)	B-blocker	4(4.87%)
Calicium channel blocker	1(1.21%)	Phenothiazine	<u>1(1.21%)</u>
<u>Chloroquine</u>	<u>1(1.21%)</u>		

Table 7 : Regarding the types of permanent pacemaker implanted we got the followings

Pacemaker	frequency	Pacemaker	frequency
DDDR	24(32.43%)	VVIR	19(25.97%)
VVI	17(22.97%)	DDD	10(13.51%)
VDDR	4(5.4%)		

قطع كهترتانيح القلة المتضمن لضروج زرع ناتض القلة الالكتروني في المركس العراقي لأمراض القلة

تشرين الاول 3122_ أب 3124

الطبية الاستشاري حسن عثد الامير الداغر

المخلص

نقد سع' اندزاسح حالاخ انقطع فت ك ستائح انقهة فت انسكص انعساق لأيساض انقهة' خاصح فت يا زعيق الأيس تالأستاب أنألعانجعمانجح .نقد دزس' 78 جانح قطع فت ك ستائح انقهة ن سظ ادخه' ادج إعاش انقهة فت انسكص انعساق فت تغداد خلال اندج بي دسندشن' الأ' نغاح أب 8102 .نقد دزس' ر'ر أنحالاخ فت يا زعيق الأيس تان جانح انع سح ,انع' صس ,انع' س' ,ع انشك'انشك, الأيساض انر ستقد جانح انقطع انك ستائ', الأ' ح انز بي ان' كان' ك كاك' ن' ا انسته ان' ثاشس ,فحص الأ' ك ,ج' جبب دث' د' ا' ت' انقهة الإنكرسالإنكرس' ان' و'قد بي عديدي'. الأ' ص' آخ انقهة' ح ,فحص ان' برس الإ' اد ,اسرقصاء حالاخ لاد' ح أ زاث' حزائح نقطع ك ستائ' ح انقهة , جانح انش' ازد'كرانك إجساء فحص قسطسج انشسا'انشسا' انراخ' ح حسة يا ذقر غذقرع' انع' اتك' انعه' ح تال'إظافح ن سر'جناخ شزاعح ان' اتط الإنكرسالإنكرس' اندائى بي عديا' نقد جد'ا ت' كم يسظ'ا' ك'ا' بي د'د انشسج انث' عاء ,أ' عدد انرك' بز 32 ت' س'ح

48,32% تثؤأ شكهء انؤسهء تُسئحؤسئح 36,45% , فقءافقءاً ان ع انؤوقء سجم نء 31 يسن ءعء ءؤسئح 37,67% , اظطسب انر اشانراش نء 25 يسن ءعء ءؤسئح 23,8% , قهح انكفاءج نء 07 يسن ءعء ءؤسئح 80,84% , حانح يا قئم فقءافقءاً ان ع انؤوقء نء 7 يسظ ءؤسئح 8,64% , قطع يي انءزج انئانئح نء 36 يسن ءعء ءؤسئح 46,20% , قطع ف انعءءج انؤ ءؤح الأءح نء 03 يسن ءعء ءؤسئح 06,16% , قطع يي ع يي ءرص انئانئاء نء 00 يسئعا ئسئح 88,28% , ءانؤسئح نلإيساض انر سئقء انقطع فهقء سجم از ءفاع ظغك انءو نء 36 يسن ءعء ءؤسئح 46,20% , ءاء انسكسن نء 86 يسن ءعء ءؤسئح 28,88% , رُ باءؤصو انصؤ اياؤ انقهبؤءح نء 3 يسظ ءؤسئح 3,76% , اظطسب انكفاءج الأ ءساعؤءح نء 86 يسن ءعء ءؤسئح 28,88% , اظطسب انكفاءج الأ قئاطؤءح نء 8 يسظ ءؤسئح 01,66% , نقء شزع آءط انقهاء انؤوقء نء 61 يسن ءعء ءؤسئح 25% , نقء سجهء حانح قطع

لاءؤءح نء يسن ءطأءء فقك ئسئح 0,80% نى ءئءء حانح قطع زائرائؤءح انؤشأ . نقء ئءء ءءء ءع قاؤ ءاؤ يعص ف انئسائسؤسؤء انراؤءح نء 81 يسن ءعء ءؤسئح 83,28% , كاءانك حانح آءء لاءرشاء انعمهؤ انقهبؤءح انءاء ءؤسئح 0,80% . نقء ءءء ع هؤ شزع ائاءط انءائى نء 63 يسن ءعء ءؤسئح 81,83% . نقء ءءءءاً ئائاً اءهءه ءالاؤ انقطع انك سئانئكسئائى قء حصهء نء ان سظ كئاز انس فء الأءهء نءنء ان سظائسظ ءء انئسؤج انئعاء . نى كك نهؤس ءائؤس اظء عهء سئح ءءز انءانؤ . ئءرء حانح اظطسب انر اشانراش نء سئح كئؤسؤج يي ان سظائسظ . اءهءه ءالاؤ انقطع كاء يصابئح ئنعساض ءءزؤءح يي انءزج انئانئح . نقء سئقء حانح انقطع ءعءو كفاءؤءح انئسؤسؤسؤء انراؤءح نء ء انءان زءع ان سظ كرانك فأ ءساقؤ از ءفاع ظغك انءو ءاء انسكسن قء سجم نء انكئؤس يي ان سظ ءؤءؤء كاكأ لاسرعؤال انعفاؤؤس كعابم يسئهء سئح اءزؤ كرانك انءال ءانؤسئح نهسئه ان لاء نقء كاكأ يي ان رطهءه شزاع انؤاءط انؤوقء نء سئح كئؤسؤج يي ان سظ كرانك انءال ءانؤسئح نصزاع انؤاءط انءائى . نقء كاء سئح انقطع ف انعءءج الأءؤءؤءؤ انئطانئطؤءؤء اكئس يي سئح انقطع ا الاظطسب فقء انعءءج انؤ ءؤح الأءؤء كاكأ الاؤرشاء انءاء ف انعمهؤ انقهبؤءح انؤرطهءرطهءه شزاع انؤاءط انءائى اءز انءؤز