

HOSPITAL – DOCTORS’ ABILITY TO INTERPRET ECGS

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ABSTRACT

The electrocardiogram is an important part of the patient's clinical assessment. A correct interpretation of the ECG is essential for a proper evaluation, as important management decisions may need to be taken based on the ECG findings. This study was carried out to assess the ability of hospital-doctors' to interpret ECG's reflecting common clinical conditions. Overall senior physicians performed better than their junior colleagues. Efforts need to be made to train the junior doctors in electrocardiography as they are at the fore-front in dealing with acute cardiac and medical emergencies.

INTRODUCTION

Presently, the ECG more or less forms part of the overall clinical evaluation of any given patient or even otherwise healthy individuals when they come for a general checkup. Most doctors, however, find ECG's difficult to read and generally would be reluctant to give their findings or a specific diagnosis if asked for one. One of the main reasons for this is that they lack a basic knowledge and concept of electrocardiography. This study was done to assess hospital based doctors' ability to give ECG diagnosis of various clinical situations of which they need to be aware and usually deal with on a regular basis.

MATERIAL AND METHODS

The study was carried out on hospital-based doctors of Civil Teaching Hospital, Abbottabad. The doctors were divided into two groups. The senior doctors consisted of consultant physicians and senior medical registrars. The junior doctors comprised of junior registrars and medical officers working in the Cardiac Care Unit and Medical Units. To see if the junior doctors working in the CCU fared any better than their colleagues in the medical units their results were kept separate. Six senior doctors and 18 junior doctors took part in the study. Five junior physicians were from the CCU and 13 from the medical department. Each of the doctors was presented with a set of 16 ECGs and requested to give a specific diagnosis for each of them. The ECGs included were as follows:

Anterior and Inferior myocardial infarction, left and right ventricular hypertrophy, left and right bundle branch block, first, second and third-degree heart blocks, atrial fibrillation, pericarditis, supra-ventricular tachycardia, ventricular tachycardia, Wolff- Parkinson-White Syndrome and a normal ECG. The ECGs were selected from various sources¹³.

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RESULTS

The results are shown in Table-1 and Table-2. There was no significant difference in the performance of the junior doctors based in the Cardiac Care Unit and those working in the medical units. The overall correct rate of junior doctors was just above 50% and that of the senior doctors 72%. On the whole most of the mistakes were made with the WPW-syndrome, right ventricular hypertrophy, pericarditis and conduction defects. The pickup rate for supra-ventricular tachycardia and ventricular tachycardia was reasonable, as both present as acute emergencies often requiring urgent action. A few mistakes were made on the "Normal ECG". Most of the alternative wrong diagnosis were of myocardial infarction.

ECG * DIAGNOSIS	JUNIOR DOCTORS				SENIOR DOCTORS		COMMON WRONG DIAGNOSIS
	CCU = 5		Medical = 13		Correct	Incorrect	
	√	x	√	x			
INF – MI	5 - 0		11 - 2		6 - 6		-
SVT	5 - 0		8 - 5		6 - 0		VT
LVH	2 - 3		8 - 5		6 - 0		MI
RBBB	3 - 2		9 - 4		5 - 1		MI
ANT – MI	3 - 2		11 - 2		5 - 1		Pericarditis
AF	2 - 3		6 - 7		4 - 2		SVT/VT
LBBB	2 - 3		10 - 3		6 - 0		MI
PERICARDITIS	2 - 3		3 - 10		3 - 3		MI
RVH	2 - 3		4 - 9		3 - 3		MI
NORMAL	4 - 1		8 - 5		5 - 1		
WPW	2 - 3		7 - 6		4 - 2		MI
VT	3 - 2		9 - 4		3 - 3		SVT
1 st Heart Block	2 - 3		6 - 7		3 - 3		Bradycardia
Mobitz Type – I	3 - 2		5 - 8		4 - 2		Ectopics
Mobitz Type – II	3 - 2		5 - 8		4 - 2		Drop Beats
CHB	2 - 3		4 - 9		4 - 2		Heart Block

TABLE-1: Depicts ECG responses of junior and senior doctors and common wrong diagnosis.

* Inf. MI = Inferior myocardial infarction, SVT = Supra-ventricular tachycardia, LVH = Left ventricular hypertrophy, RBBB = Right bundle branch block, Ant. MI Anterior myocardial infarction, AF = Atrial fibrillation, RVH: Right ventricular hypertrophy. WPW = Wolff-Parkinson-White Syndrome, VT: Ventricular tachycardia, CHB= Complete heart block. DX= diagnosis.

	JUNIOR CCU DOCTORS	JUNIOR MEDICAL DOCTORS	SENIOR DOCTORS
ECGs Attempted	80	208	96
Correct Dx.	45	114	71
Incorrect Dx.	25	94	25
% of ECGs correct	56%	54%	73%

Table – II: Showing overall results of Junior and Senior Doctors

DISCUSSION:

In 1887, Augustus Desire Waller obtained the first electrocardiogram⁴. The first electrocardiograph yielding good tracings was made by Willem Einthoven in 1903⁴. The ECG changes of myocardial infarction were first described in man in 1920⁸. Most of what is known today about the resting ECG is attributable to Frank N. Wilson and his colleagues⁴.

The ECG can be crucial in the diagnosis of many medical emergencies. A correct interpretation of the 12-lead ECG will lead to a diagnosis in most of the cases. The ECG is one of the most commonly requested investigations by physicians and practitioners alike. A working knowledge of the ECG will help in the evaluation of patients in the casualty and out-patient's departments as well as those admitted in the cardiac care medical units. Many a times serious and life-threatening rhythm disturbances warrant immediate and emergency measures. What steps are taken will depend on how the attending physician assesses the clinical situation in conjunction with the ECG.

The results of this study suggest that on any given ward-round, attending the outpatients or medical emergencies the junior doctors will probably misinterpret about half the ECG's. This is a bit concerning as the junior doctors are responsible for the acute management of these patients. It can be hazardous from the patient's point of view if a myocardial infarction is missed or a rhythm disturbance inappropriately treated. It is not uncommon for patients with VT to be mistakenly diagnosed and treated as SVT⁶. Verapamil which is the drug of choice in SVT, can be dangerous in VT. Overall there was a tendency to over diagnose myocardial infarction on the ECGs. This, however, may not be a disadvantage as the patient gets the benefit of doubt and is either admitted or the ECG probably discussed with another colleague to be sure as regards the changes.

As house officers and junior doctors many feel that "Reading the ECG" is beyond their means or capacity. Many when presented with an ECG will simply return it back with a "I don't know" nod of the head even without bothering to have a look at it. Reading the ECG is perhaps not as difficult as some people like to believe. A basic knowledge, systematic approach and regular practice is required. Most of the routinely done ECGs are within normal limits and if one can correctly identify them than half the job is done. Assistance can always be sought with abnormal or complicated recordings.

In order to improve hospital-doctor's ability to correctly interpret ECGs steps need to be taken

during their training as house officers and subsequently when they are starting working in the wards as Medical Officers and Registrars. It will help to improve patient management and provide better care.

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