



CLINICAL PROFILE OF 2D ECHO CARDIOGRAPHY AT THE CARDIOLOGY DEPARTMENT OF CHL MULTISPECIALTY HOSPITAL AND RESEARCH CENTRE.

Cardiology

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ABSTRACT

Introduction: Echocardiography is the basic and important imaging technique used for the diagnosing the various numbers of Cardiac Conditions. This helps clinicians for diagnosing a various number of clinical variations. This functional data is needed to care for patients with many pathologies and used to diagnose a number of diseases. Trans-Thoracic Echocardiography is the most common Echocardiography done in every Cardiology Department of Centre. The use of 2D Echo provides the proper and fast diagnosis and allows the clinicians to make further diagnosis. In this study, we focus on Current Clinical Profile of the distributed Age Groups along with risk factors and advised recommendations with comparison of Diagnosis.

Methods: In this case study, total of 1447 patients were divided in 6 Age Groups, profiled for the outcomes of the 2D Echocardiography. We aimed to determine the Current Clinical Profile with the Diagnosis, Risk Factors and Advised Recommendations in each age group in a Cardiac Intensive Care Unit (CICU) in CHL Multispecialty Hospital and Research Center, Chandrapur using a prospective observational study.

Patients: All consecutive patients followed up for 2D Echocardiography at the Cardiology Department between April 2021 and August 2021 were included if they were aged more than 18 years. Patients eligible for the study were evaluated for the current profile of the patient, risk factors and Advised Recommendations in each Age group.

Results: In the study conducted, the clinical profile had a good result in suggesting that most of the patients in all age groups had the diagnosis of Good biventricular systolic function, No RWMA, Normal chamber dimension & Valve function. Uncontrolled Sugars and Accelerated Hypertension made worse for patient's cardiac management. Some Results of 2D Echo were also affected because of the emergency in the CICU, for which 2D Echo was postponed later or after stability of the patient. Past Medical History had the significant role. The clinical profile helped us understand the proper diagnosis and recommendations done

KEYWORDS

2D Echocardiography, Cardiac Management, Clinical Profile, Past Medical History, Habits.

INTRODUCTION

Echocardiography is the non-invasive procedure that deals with the use of ultrasound to evaluate the different structural components and parts of the heart. It is one of the most common procedure done in every cardiology department. As, Echocardiography is simplest and non-invasive procedure dealing with cardiac anatomy [1]. Echo cardiography, helps the clinicians to understand the variations in the thin cross-sections of cardiac structures [2]. These, Cardiac structures are Left and Right Atrium, Left and Right Ventricles, valves (Size and Functioning) and associated Valvular structures [3]. In addition to Echocardiography, combination of doppler allows the clinicians to evaluate haemodynamics of Cardiovascular function [4]. This combination can allow the clinicians to assess and diagnose the valvular stenosis and regurgitation [5]. The another most important aspect of Echocardiography is that evaluation of function of cardiac muscle during the cardiac cycle [6].

Trans-Thoracic Echocardiography is the most common Echo cardiography done in every Cardiology Department of Centre [7]. Out of the most of views, the four views are known and considered to be standard, this includes Parasternal long-axis, Parasternal Short axis, apical four-chamber and subxiphoid view [8]. The Parasternal long-axis View can be obtained by placing the echo probe towards the left of sternum at the 4th Intercoastal space perpendicular to the chest wall. In this view, the right ventricle, left ventricle, left atrium and aortic outflow can be evaluated [9]. In addition, associated valve functions which include mitral valve, tricuspid and aortic valve [10]. The Parasternal Short Axis view can be obtained by orienting the probe 90 degrees from the Parasternal long-axis. In this view, Cross Sectional of left ventricle, papillary muscles and cross section of right ventricle can be visualised [11]. This

view can help clinician to evaluate the Left Ventricular Wall Function [12]. The apical four-chamber view is obtained by positioning the probe by left nipple males and beneath left breast in females, which is then directed towards the heart and right shoulder. This view can be used to evaluate the both ventricles and right heart strain [13]. The right

heart strain is the indicator of Pulmonary Embolism [14]. The subxiphoid view shows the left lobe of liver, and Inferior Vena Cava (IVC), Right Atrium. The compressibility of IVC can be used to assess the preload. If the IVC can be compressed easily, Lower Preload, If IVC can hardly be compressed, Higher Preload [15]. Furthermore, IVC compressibility is variable in patients and could not be considered the standard form of preload assessment, therefore it should be only used as addition with other volume assessment modes [16].

The use of 2D Echo provides the proper and fast diagnosis and allows the clinicians to make further diagnosis. In this study, we focus on Current Clinical Profile of the distributed Age Groups along with risk factors and advised recommendations with comparison of Diagnosis.

PATIENTS

We conducted a prospective and observational study in Cardiac ICU of CHL Multispecialty Hospital and Research Centre, Chandrapur. 2D Echo Patients are received from the follow-up OPD (Out-Patient Department), IPD (In-patient Department), Bed-side screening at Cardiac ICU (CICU) and Referred Patients for 2D Echo. A total average of 3225±50 2D Echo's are done at Department of Cardiology at CHL Multispecialty Hospital and Research Centre. After, 2D Echo, Based on the diagnosis, doctors at CHL Hospital recommend the procedures or Medical Management. All the patients who did 2D Echo from March 2021 and August 2021 were Included in this study, with the age above 20 years. Patients eligible for the study were evaluated for the current profile of the patient, risk factors and Advised Recommendations in each Age group.

METHODS

Patients were divided into 6 Age Groups, 21 Years – 30 Years, 31 Years – 40 Years, 41 Years – 50 Years, 51 Years – 60 Years, 61 Years – 70 Years, 71 Years – 80 Years. All Patients Coming in this age group were then tabulated in the list form along with Real Time Graph Formation from the Microsoft Excel Itself. We totally focused on Trans-Thoracic 2D Echo, as the sample size was considerable for study. At CHL Multispecialty Hospital, We have GE Healthcare Vivid S-6, Whose

real time data collection at the storage server made it possible to collect such sample in real time. Based on the diagnosis, patients were then advised for the Coronary Angiography (CAG), TMT (TreadMill Test), PTCA (Percutaneous Transluminal Coronary Angiography) or other recommendations. For the clinical Profile, we used the history sheets of patients for the Past Medical History and Current Habits, so that we can evaluate the risk factors for the current age group, and based on it, the recommendations made were then averaged for the age group between the male and female age group. All the data was tabulated in real-time Graph and Data analyser in Microsoft Excel Itself.

DATA COLLECTION

The data was collected directly from the patients History Sheets and 2D Echo reports. The major data collected was generally the normal habits of the patients and the Past Medical History. All the data was already documented and categorised into the factors before the 2D Echocardiography Procedure. Bedside screening was done as soon as admission to CICU, and also focused on the factors of criticality of the patients and sometimes it was postponed to after stabilisation of patient, which could not derive the appropriate results of the patients. Postponing Factors were Sudden cardiac Arrest after admission, Preparation for Primary Angioplasty for Myocardial Infarction (PAMI) and Patient too unstable. At the IPD of CHL Hospital, nearly all the patients are in stable state, for 2D Echo, patients are directly taken for 2D Echocardiography at the 2D Echocardiography Centre of the hospital. All the 2D Echocardiography Equipments were connected to Hospital Cloud Server, which could generate the real time report in the proposed study timeperiod.

STATISTICAL ANALYSIS

The statistical analysis was done in real time entries of the 2D echo reports on the Hospital server. The real time data collection was then tabulated in the Microsoft Excel 2016 (English) India. The analysis of the inputs of data like Past Medical History like Hypertension (HTN), Type 2 Diabetes Mellitus (T2DM), PTCA, Psychiatric History, Coronary Angiography Bypass Graft (CABG) and None. Habits like Tobacco, Substance Abuse, Alcohol, Smoking and None. The data presented in the figures along with the count numbers and percentages for easy categorisation during the study. The study was done using the percentage method itself, as there was just the clinical profile and discussion on the basis of age group.

RESULTS

In a 5-month period, a total of 1447 patients had their 2D Echocardiography done, at the 2D Echocardiography Centre and Research Centre. Out of which, 1426 Patients were included in our observational study. Patients divided into 6 groups based on the age factors. The respective age groups were then categorised on the basis of Sex, Male (M) and Female (F). The respective age groups were 21 Years – 30 Years (n = 129 of which M = 77 and F = 52), 31 Years – 40 Years (n = 248 of which M = 135 and F = 113), 41 Years – 50 Years (n = 227 of which M = 136 and F = 91), 51 Years – 60 Years (n = 427 of which M = 256 and F = 171), 61 Years – 70 Years (n = 314 of which M = 188 and F = 126), 71 Years – 80 Years (n = 81 of which M = 51 and F = 30) [Figure 1]. The results in the respective age groups are discussed below [Figure 2, 3]. All the table forms of the data are presented in the Table 1, 2 and 3.

Age Group 21 Years – 30 years : A total of 129 patients were categorised in this age group. The total number of males were 129 and Females were 52. The Habits that was most prevalent was Tobacco (n = 81 of which M = 51 and F = 30) and the least prevalent was Smoking (n = 81 of which M = 51 and F = 30). The Most Common Past Medical History was Hypertension (n = 81 of which M = 51 and F = 30) and the least common was CABG (n = 81 of which M = 51 and F = 30) and Psychiatric History (n = 81 of which M = 51 and F = 30). The most common diagnosis in this age group was Structurally Normal Heart, No RWMA, Good Biventricular Systolic Function. There was a rare diagnosis for Ischemic Heart Disease in this age group. The most recommended advise was Coronary Angiography (n = 81 of which M = 51 and F = 30), Medical Management (n = 81 of which M = 51 and F = 30) and Treadmill Test (n = 81 of which M = 51 and F = 30).

Age Group 31 Years – 40 years : A total of 248 patients were categorised in this age group. The total number of males were 135 and Females were 113. The Habits that was most prevalent was Tobacco (n = 60 of which M = 48 and F = 12) and the least prevalent was Substance Abuse (n = 22 of which M = 21 and F = 1). The Most Common Past Medical History was Hypertension (n = 100 of which M = 46 and F =

54) and T2DM (n = 85 of which M = 54 and F = 35). The most common diagnosis in this age group was Good biventricular systolic function, No RWMA, Normal chamber dimension & Valve function. The most recommended advise was Coronary Angiography (n = 97 of which M = 53 and F = 44), Medical Management (n = 57 of which M = 31 and F = 26) and Treadmill Test (n = 108 of which M = 59 and F = 49).

Age Group 41 Years – 50 years : A total of 227 patients were categorised in this age group. The total number of males were 136 and Females were 91. The Habits that was most prevalent was Tobacco (n = 95 of which M = 57 and F = 38) and the least prevalent was Smoking (n = 14 of which M = 6 and F = 8). The Most Common Past Medical History was Hypertension (n = 90 of which M = 54 and F = 36) and the T2DM (n = 58 of which M = 35 and F = 23). The most common diagnosis in this age group was Structurally Normal Heart, No RWMA, Good Biventricular Systolic Function and Rheumatic Heart Disease or Ischemic Heart Disease. The rare diagnosis was chronic Constructive Pericarditis, No RWMA, Good Biventricular Systolic function, mild mr, mild ar, mild tr in this age group. The most recommended advise was Coronary Angiography (n = 89 of which M = 53 and F = 36), Medical Management (n = 53 of which M = 32 and F = 21) and Treadmill Test (n = 99 of which M = 59 and F = 40).

Age Group 51 Years – 60 years : A total of 427 patients were categorised in this age group. The total number of males were 256 and Females were 171. The Habits that was most prevalent was Tobacco (n = 178 of which M = 107 and F = 71) and the least prevalent was Smoking (n = 21 of which M = 13 and F = 8). The Most Common Past Medical History was Hypertension (n = 242 of which M = 164 and F = 78) and T2DM (n = 80 of which M = 48 and F = 32). The most common diagnosis in this age group was Ischemic Heart Disease, RWMA, Variable LV dysfunction, with variable LVEF, Variable RV Function, mostly Normal diastolic Function. The most recommended advise was Coronary Angiography (n = 135 of which M = 69 and F = 66), Medical Management (n = 97 of which M = 58 and F = 39) and Treadmill Test (n = 187 of which M = 112 and F = 72).

Age Group 61 Years – 70 years : A total of 314 patients were categorised in this age group. The total number of males were 188 and Females were 126. The Habits that was most prevalent was Tobacco (n = 103 of which M = 71 and F = 32) and the least prevalent was Smoking (n = 26 of which M = 18 and F = 8). The Most Common Past Medical History was Hypertension (n = 128 of which M = 71 and F = 51), T2DM (n = 80 of which M = 48 and F = 32) and CABG (n = 7 of which M = 5 and F = 2). The most common diagnosis in this age group was Structurally Normal Heart, No RWMA, Good Biventricular Systolic Function. There was a rare diagnosis for

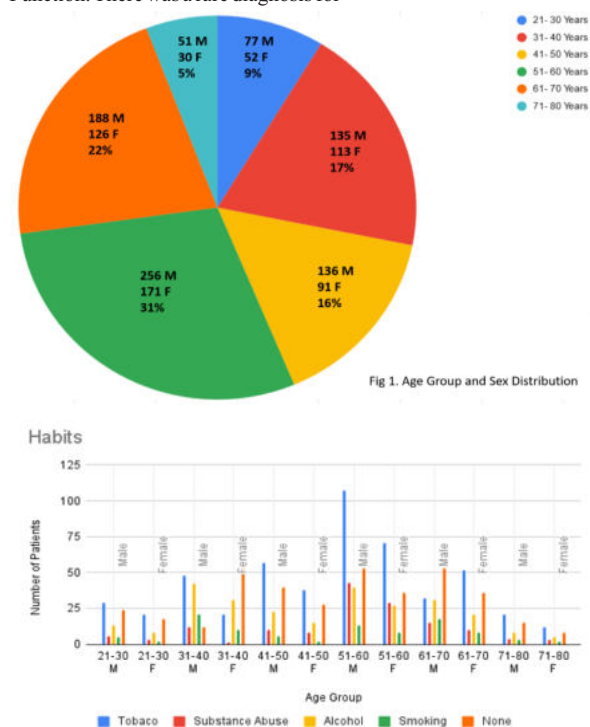


Figure 2. Habits of the Patients

Past Medical History

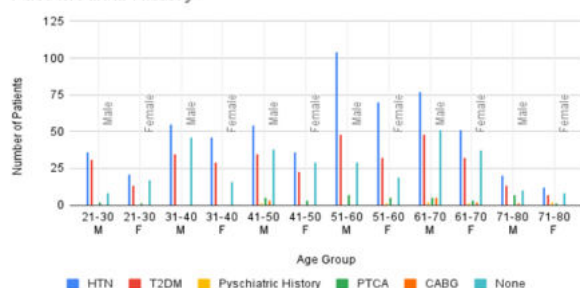


Figure 3. Past Medical History

Final Recommendations



Figure 4. Final Recommendations

Table 1. Habits of the Patients

Age Group	Sex	Tobacco	Substance Abuse	Alcohol	Smoking	None
21-30 M	Male	29	6	13	5	24
21-30 F	Female	21	3	8	2	18
31-40 M	Male	48	12	42	21	12
31-40 F	Female	21	1	31	10	60
41-50 M	Male	57	10	23	6	40
41-50 F	Female	38	8	15	2	28
51-60 M	Male	107	43	40	13	53
51-60 F	Female	71	29	27	8	36
61-70 M	Male	32	15	31	18	53
61-70 F	Female	52	10	21	8	36
71-80 M	Male	21	4	8	3	15
71-80 F	Female	12	3	5	2	8

Table 2. Past Medical History of the Patients.

Age Group	Sex	HTN	T2DM	Psychiatric History	PTCA	CABG	None
21-30 M	Male	36	31	0	2	0	8
21-30 F	Female	21	13	0	1	0	17
31-40 M	Male	55	35	0	0	0	46
31-40 F	Female	46	29	0	0	0	16
41-50 M	Male	54	35	1	5	3	38
41-50 F	Female	36	23	0	3	0	29
51-60 M	Male	104	48	0	7	0	29
51-60 F	Female	70	32	1	5	0	19
61-70 M	Male	77	48	2	5	5	51
61-70 F	Female	51	32	1	3	2	37
71-80 M	Male	20	13	0	7	1	10
71-80 F	Female	12	7	2	1	0	8

Table 3. Clinical Profile of Recommendations done after 2D Echocardiography.

Age Group	Sex	CAG	Medical Management	TMT	PTCA	BMV	Pericardiocentesis	CABG	MVR	PPI	Holter Study	DVR
21-30 M	Male	30	17	33	2	2	1	0	2	3	1	0
21-30 F	Female	20	11	22	1	1	1	0	1	2	1	0
31-40 M	Male	53	31	59	2	2	1	0	2	6	3	0
31-40 F	Female	44	26	49	1	1	1	0	1	5	1	1
41-50 M	Male	53	32	59	1	1	0	1	1	1	2	0
41-50 F	Female	36	21	40	1	1	2	0	1	2	1	0
51-60 M	Male	99	58	112	4	4	1	0	4	3	3	0
51-60 F	Female	66	39	75	2	2	0	0	2	1	1	0
61-70 M	Male	73	43	82	3	3	0	0	3	2	2	0
61-70 F	Female	49	28	55	2	2	0	0	2	5	1	0
71-80 M	Male	20	11	22	0	2	0	0	2	3	0	0
71-80 F	Female	11	6	13	0	1	0	0	1	1	0	0

Sclerotic Aortic Valve - Mild MR, No RWMA, Good Biventricular Systolic Function. Grade I diastolic dysfunction in this age group. The most recommended advise was Coronary Angiography (n = 122 of which M = 73 and F = 49), Medical Management (n = 71 of which M = 43 and F = 28) and Treadmill Test (n = 137 of which M = 82 and F = 55).

Age Group 71 Years - 80 years:

A total of 81 patients were categorised in this age group. The total

number of males were 51 and Females were 31. The Habits that was most prevalent was Tobacco (n = 33 of which M = 51 and F = 30) and the least prevalent was Substance Abuse (n = 7 of which M = 4 and F = 3). The Most Common Past Medical History was Hypertension (n = 14 of which M = 12 and F = 2), T2DM (n = 20 of which M = 13 and F = 7) and PTCA (n = 8 of which M = 7 and F = 1). The most recommended advise was Coronary Angiography (n = 31 of which M = 20 and F = 11), Medical Management (n = 17 of which M = 11 and F = 6) and Treadmill Test (n = 35 of which M = 22 and F = 13).

RISK FACTORS AND ADVISED RECOMMENDATIONS:

In the observational study conducted, we found a characteristic characters and risk factors involved with the advised recommendations. Since, 2D Echo is non-invasive procedure that marks the utmost safety and easy to handle on every patients. In the Age group 21 Years – 30 Years, there was no major risk, hence, advised them Coronary Angiography and Medical Management [Figure 4]. In the Age Group 31 Years - 40 Years, There was also no such risk associated, But as the age factor, we advised for CAG and PTCA. In the Age Group 41 – Age Group 50, there was major risk for the patients, as in this group, most common diagnosis was Ischemic Heart Disease. Hence, Patients were advised for CAG and PTCA, and those who had major Stenosis, was advised for CABG, later. In the Age Group 51 – Age Group 60, Patients had risk of Age factor, Many Patients were at the uncontrolled sugar levels and Accelerated Hypertension. In the Age Group 61 – Age Group 70, Patients were at Risk, 7 Patients had history of CABG, which was risk factors for medical management and poor drug compliance made it worse. Thus, In this age group the risk factors were more significant. In the Age Group 71 – Age group 80, The risk factors were significantly less than the previous age group. All the age groups were at the varied level of risk factors.

DISCUSSION:

The Clinical Profile of 2D Echo Cardiography at the Cardiology Department of CHL Multispecialty Hospital and Research Centre helped in assessment of Risk Factors and development of preventive measures for the risk factors. The Age group 21 Years – 30 Years, did not have any major risk factors, but the history and habits need to be controlled by the same age group to prevent reoccurrence of Presenting Complaints like Chest Pain, Pain radiating from left hand towards chest and anginal pain. History of Habits was major impact influential factor for the whole study. The major recommendations in the whole study was for TMT and then followed by CAG. Some other tests like PTCA, BMV, Pericardiocentesis were very rarely suggested direct after 2D Echo.

In the all age groups it was found that the major Habit was of Tobacco Chewing, Followed by Alcohol, and Smoking. Patients were advised to stop such habits to reduce the episodes of chest pains. Past Medical History has severely affected the patients cardiac management, especially in the higher age groups because of uncontrolled sugars and accelerated Hypertension, as of poor compliance towards drugs.

In the age group of 61 Years-70 Years, 7 Patients were presented with the history of CABG, this patients 2D Echo reports had the diagnosis of Ischemic Heart Disease with reduced LVEF or Dilated Cardiomyopathy. For which patients were suggested for urgent PTCA to the Infarct side or Medical Management.

Clinical Profile of the patients help the hospitals to understand the type of patients in the period and improves the scope of medical management of the hospital. After, the clinical profile is done, clinicians can analyse the current trends and can organise the epidemiological characters of patients at CHL Multispecialty Hospital and Research Center.

CONCLUSION:

In the study conducted, the clinical profile had a good result in suggesting that most of the patients in all age groups had the diagnosis of Good biventricular systolic function, No RWMA, Normal chamber dimension & Valve function. Uncontrolled Sugars and Accelerated Hypertension made worse for patient's cardiac management.

Some Results of 2D Echo were also affected because of the emergency in the ICU, for which 2D Echo was postponed later or after stability of the patient. Past Medical History had the significant role. The clinical profile helped us understand the proper diagnosis and recommendations done.

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