

Estimation of Heart Valves Velocity Value in Healthy Males by Using Doppler Echocardiography

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ABSTRACT

Objectives: To determine the velocity of heart valves' flow in fit Sudanese males.

Materials and Methods: The study was conducted on 160 men and the mean age was 44.2 years (mean age 44.2 ± 9.7 years). Free from any heart problems. Different ultrasound modes were used in this survey.

Results: The healthy participant males, show standard normal limits of heart valves' mean velocity. In comparison to previous studies, there was no difference in the detected values.

Conclusion: The outcomes of the current survey indicate that the velocities of cardiac valves in Sudanese population correspond to those reported values in Western literature. So normal values of these Doppler parameters should be borne in mind for non-invasive cardiovascular function assessment.

Keywords: *Echocardiography; Velocity values; Valves; Healthy Males; Heart*

INTRODUCTION

Echocardiography is the most prevalent modality in heart imaging (1). Because of its safety in assessing heart anatomy and function, echocardiography has become the best choice for investigation. Also Doppler- development methods have increased the ability to detect blood flow and evaluate any abnormalities in the heart valves (2). Two methods are used for heart and vessels imaging: through the chest, in which we manipulate the probe intercostal to get various images (3); and intracardiac blood flow rates. The information come from heart muscles or

great vessels, can rebuild in spectral pulse tissue in on-line and off-line phases for study and training reasons (4). Central tendency and dispersion measurements are widely used in determining the standard values of research samples (5).

From available information and previous studies worldwide or from survey research done in the population sample indicated figures could establish (6-8).

The Sudanese population needs their own standard parameters values for echocardiography, which depend on age, gender, lifestyle, and place of residence.

MATERIAL AND METHOD

The survey was achieved to establish a database of normal cardiac valves velocity. The sample size was 160 individuals, all of them were males, ages 28 - 67 years (mean age 44.2 ± 9.7 years). Only fit participants were included. Those less than eighteen years or with known heart diseases were ruled out.

Different ultrasound modes share in made heart images, using VIVID S9 with probe frequency of 2.7 MHz, after permission from the participant, international standard protocols applied to obtain various echocardiogram in different position and get multiples parameters for heart structures (9).

A statistical approach was used to evaluate the value of normal ranges in which most of the sample size dropped into these ranges (9).

The scientific research ethical committees (in study areas) accepted this research.

RESULT

The participants' weight and height were 68 ± 10.5 kg, 1.7 ± 0.1 m respectively, and the mean BMI was 24.9 ± 2.6 kg/m². Table 1 reviews patients' demographic information.

The clinical characteristics of the participants are given in (table 1).

Table 1. Clinical characteristics of study samples.

Age (years)	44.2±9.7
Weight (kg)	68±10.5
Height (m)	1.7±0.1
Body mass index (kg/m ²)	24.9±2.6

The echocardiographic measurements, and comparison to other studies are shown in (tables 2 and 3) respectively.

Table 2. Echocardiographic measurements.

Valve	Velocity (m/see)
Mitral	0.9 ± 0.2
Tricuspid	0.6 ± 0.1
Pulmonary	0.8 ± 0.1
Aortic	1.3 ± 0.1

Table 3. Sudanese adult males' parameters in comparison to another study.

Parameters	Sudanese males	Another study males
Mitral velocity m/s	0.5 – 1.3	0.5 – 1.3
Tricuspid velocity m/s	0.4 – 0.8	0.4 – 0.9
Pulmonary velocity m/s	0.5 – 1.0	0.7 – 1.2
Aortic velocity m/s	1.1 – 1.5	0.8 – 1.6

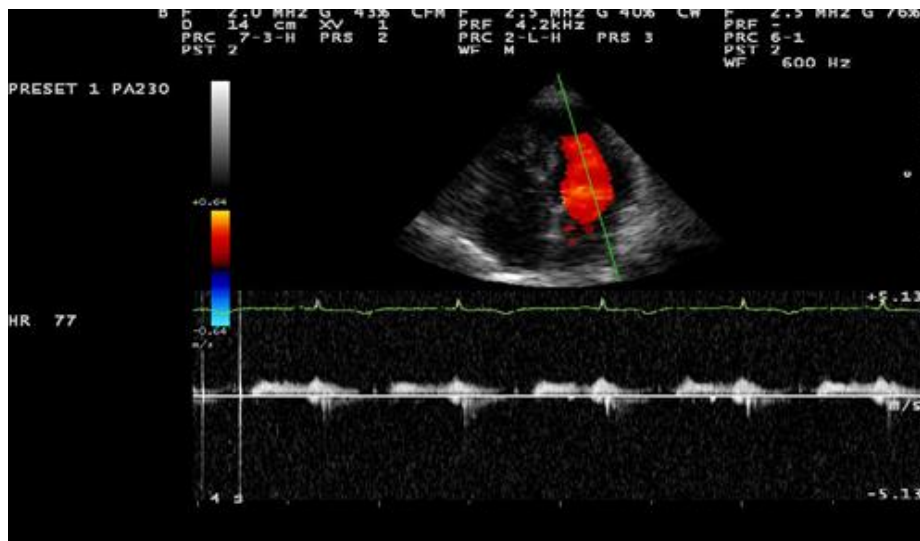


Fig 1 Continuous wave Doppler assesses the blood flow in of mitral valve.

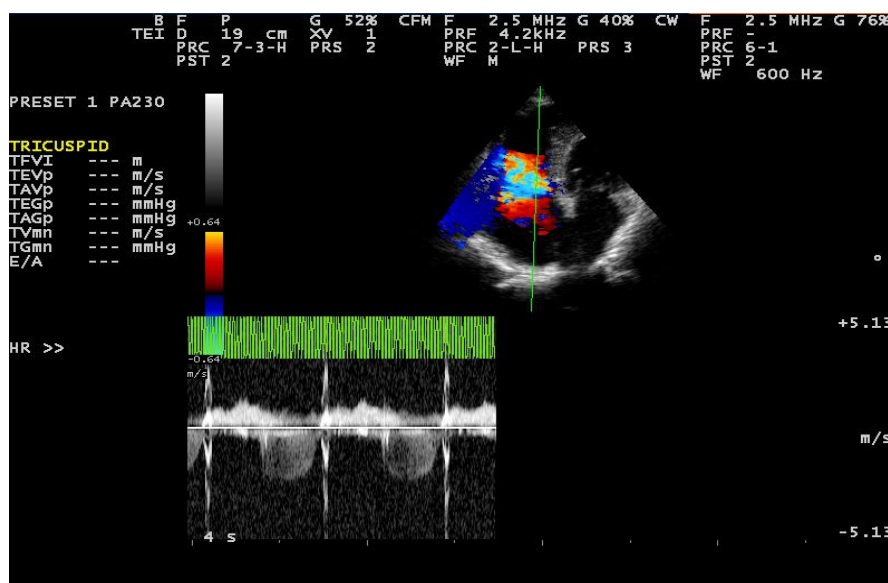


Fig.2 Continuous wave Doppler assesses the blood flow in of tricuspid valve

The aortic valve had the highest velocity (1.3 ± 0.1 m/s), then the mitral valve (0.9 ± 0.2 m/s) and pulmonary valve (0.8 ± 0.1 m/s), and tricuspid valve had the lowest (0.6 ± 0.1 m/s). Figures 1 and 2 showed the assessing of the heart valves by echocardiographic Doppler ultrasound.

DISCUSSION

This recent survey provides a chance to establish a reference range in echocardiography for healthy Sudanese adult males. Using modern imaging modalities, efforts have made to create a database for standard heart ultrasound values (10-12).

Adjustment of the normal index values for heart anatomy and physiology can help to differentiate between healthy and sick people (13).

When looking for identify reference the methods of data collection expressed, most of the recent survey done in this scope ignores these criteria. Information from healthy persons has the priority to include in the database of ultrasound of the heart as a normal value (14).

Adult population has an equal chance to include in this study, this gave it a high score over other researches and studies (14).

The result of the current study match with those found in textbooks. Compared with previously published normal values, the ranges of this study are identical to those reported in same states of continent.

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