STUDY OF CARDIOMEGALY IN PAEDIATRICS

Thesis

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of Master Degree of Paediatrics

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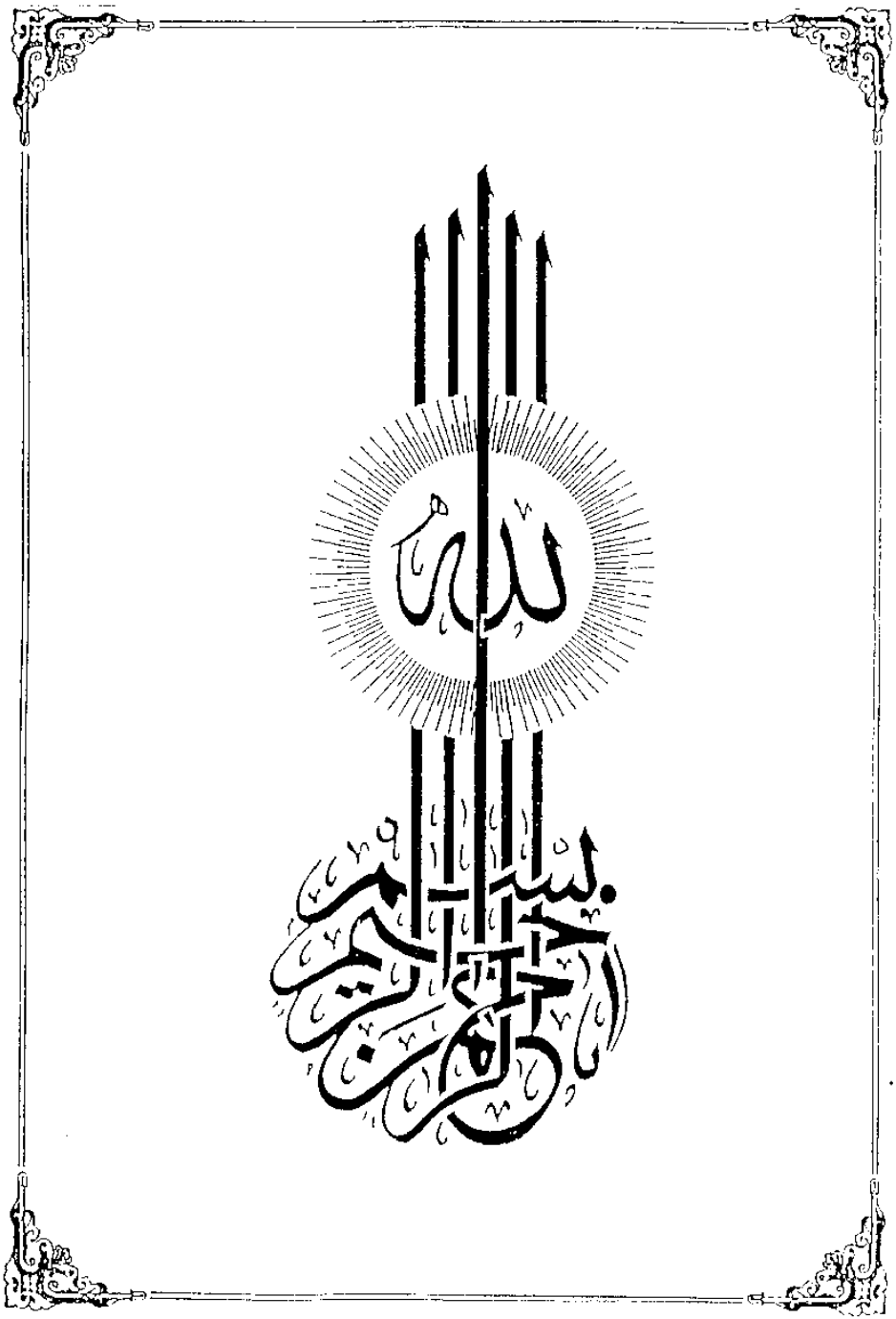

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INTRODUCTION

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Cardiomegaly is a common problem among the cardiac diseases in pediatrics. It is not a disease but it is a clinical sign that may result from a wide spectrum of conditions which affect the heart. Cardiomegaly means increase in heart size due to dilatation of a chamber, hypertrophy of the myocardium or exaudative reaction of the pericardium (Soul and Rabinson, 1978).

In infants and children, it usually results of extreme volume or pressure overload of the heart. Generalized cardiac enlargement is more commonly due to rheumatic fever, infective endocarditis, acute infection and intoxication, heart failure, long standing anemia, cretinism and pericardial effusion. Valvular diseases and congenital heart diseases are the causes of individual chamber enlargement.

Radiologically, cardiomegaly is diagnosed when the cardiothoracic ratio exceeds 0.5 in children, 0.46 in adult male and 0.49 in adult female. (Batt, 1960).

AIM OF WORK

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The aim of this work is to study the incidence of cardiomegaly in different cardiac patients attending the pediatric cardiology out patients clinics in Ain Shams University.

Cardiomegaly will be assessed by different parameters which include clinical, electrocardiographic, and rediological examinations. Evaluation of these different parameters will be attempted.

REVIEW OF LITERATURE

ANATOMY OF THE HEART

The heart is a conical hollow muscular organ inside the pericardium, occupying the major part of the middle mediastinum. It is formed of four chambers: two atria (right and left) and two ventricles (right and left). The heart has an apex, a base, and two surfaces: sternocostal surface and diaphragmatic surface.

The apex:

It is formed only by the left ventricle. It is directed downwards,forwards and to the left. It is overlapped by the left pleura and lung, and it lies opposite the left fifth intercostal space three and half inches from the median plane in adult, and opposite the fourth intercostal space just inside the midclavicular line in children. (Anson and Mcvay,1971).

The base of the heart:

It is quadrilateral in shape and is formed mainly by the left atrium and to a small extent by the back of the right atrium. It lies opposite the middle four

thoracic vertebrae (from 5th to 8th) in recumbent position, and from (6th to 9th) vertebrae in erect position. It is seperated from the vertebrae by the descending aorta and the oesophagus.

Sterno-costal surface:

It is divided by the coronary groove into atrial and ventricular portions:

1) The atrial portion: above and to the right of the coronary groove. It is formed mainly by the right atrium.

2) Ventricular portion: below and to the left and formed mainly by the right ventricle.

Diaphragmatic surface:

The left ventricle forms two thirds of this surface, and only one third is formed by the right ventricle.

Borders of the heart:

Upper border: is formed by the two atria, mainly the left. It is nearly straight, and hidden anteriorly by the pulmonary trunk, ascending aorta, and superior vena cava.

Right border: is formed only by the right atrium. It is nearly vertical or slightly convex.

Lower border: formed by the right ventricle and the apical part of the left ventricle. It is slightly concave downwards owing to the upward convexity of the diaphragm.

Left border: is rounded and is formed mainly by the left ventricle, but to a slight extent above, by the left auricle. (Roger and Williams, 1973).

The right atrium: (RA)

The cavity of the right atrium is composed mainly of two parts:

A) Posterior part: has a smooth wall and receives the openings of the great veins. Therefore, it is called the venous sinus or sinus venarum.

B) Anterior part: has a rough wall and is called the atrium proper. It is continuous anteriorly with the right auricle. The interatrial septum presents an oval depression called the fossa ovalis which lies above and to the left of the opening of the inferior vena cava.

The right ventricle: (RV)

The cavity is differentiated into two parts, the inflowing part and the outflowing part. They are separated by a muscular ridge called the supraventricular crest.

The inflowing part: It has a rough wall due to the presence of muscular projections which give rise to the papillary muscles. These muscles have one end or base continuous with the wall, while the other end gives origin to cordae tendinae which are connected to the cusps of the tricuspid valve.

The outflowing part: It has a smooth wall and it is called the infundibulum, this part remains contracted during ventricular diastole to support the pulmonary valve against the back pressure in the pulmonary trunk.

The tricuspid valve : This valve guards the tricuspid orifice which connects the right atrium with the right ventricle.

The Pulmonary valve: it is formed of three semilunar cusps, two are anterior and one is posterior.It is found at the summit of the infundibulum and is attached to the root of the pulmonary trunk.

The left atrium: (LA)

Forms the greater part of the base of the heart. It forms the anterior boundary of the oblique sinus of the pericardial cavity. It lies behind and to the left of the right atrium with the interatrial septum in between. The left auricle lies to the left, infront of the pulmonary trunk.

The left atrium receives oxygenated blood from the lungs through four pulmonary veins all open into the upper part of its posterior wall and are not guarded by valves.

The left ventricle: (LV)

This is longer than the right ventricle and forms the apex of the heart. Its interior presents two large and thick papillary muscles. Each one sends its cordae tendinae to both cusps of the mitral valve. The blood reaches the left ventricle through the left atrio-ventricular orifice and leaves it through the aortic orifice.

The Mitral valve: This valve guards the mitral orifice. It is composed of two cusps anterior and one cusp posterior.