HEART DISEASES WITH PREGNANCY

رسالة

Essay
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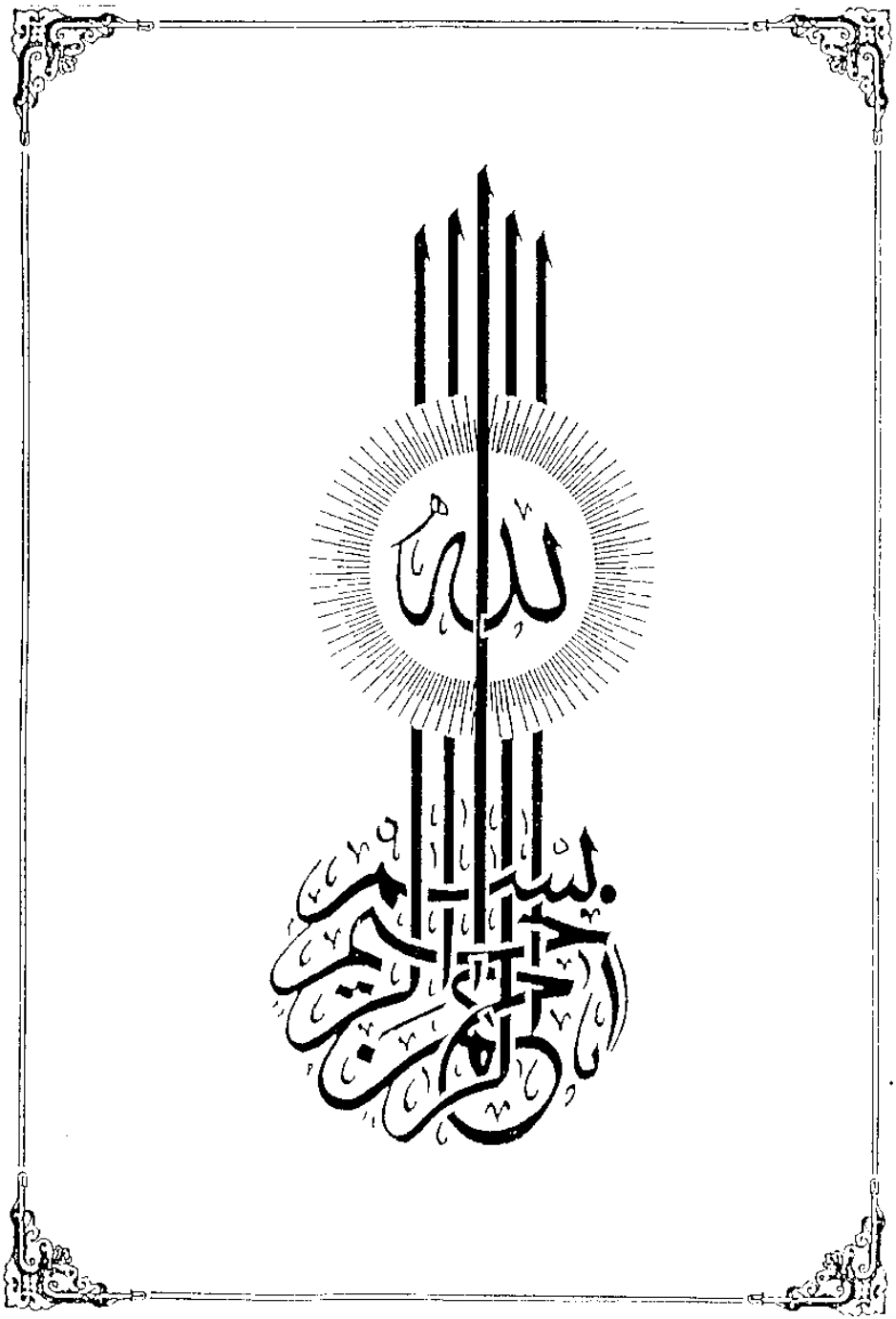

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INTRODUCTION

Heart diseases occur in approximately 1% of all pregnancies, it is the fourth common cause of maternal deaths and the most common indirect cause of maternal mortality, with the decrease in the frequency of rheumatic fever and rheumatic heart disease concomitant with the improvement in medical and surgical therapy for congenital heart diseases. The clinician providing care for pregnant women is faced with a different spectrum of cardiac diseases compared with his counterparts two to three decades earlier, **[Gilstrap III, 1989]**.

Pregnancy brings about many significant alterations in the maternal cardiovascular system. The pregnant patient with normal cardiac function accommodates these physiologic changes without difficulty. However, in the presence of significant cardiac diseases, pregnancy may be extremely hazardous resulting in decompensation and even death. Despite advances in the diagnosis and treatment of maternal cardiovascular disease, such conditions continue to account for up to 30% of maternal mortality, **[Clark, 1991]**.

Heart diseases with pregnancy include; rheumatic, congenital heart

diseases, whereas other varieties such as; coronary, thyroid, syphilitic, and kyphoscoliotic cardiac disease, as well as, cor pulmonale, constrictive pericarditis, various forms of heart block, and isolated myocarditis are even less common, **[Cunningham et al., 1990]**.

Heart diseases with pregnancy are complicated by severe maternal hypoxia which is likely leading to abortion. Preterm labor and delivery, or fetal death. Fetal wastage accounts for 36 percent in women with hypoxic congenital heart disease, **[Whittemore, 1980]**.

Aim of the work:

It aims to cover the recent literature regarding the subject of heart diseases with pregnancy concerning:

Incidence of cardiac diseases with pregnancy
Types of cardiac lesions
Risks of pregnant maternal and fetal outcome
Diagnosis of heart diseases
Diagnostic procedures during pregnancy
Surgery and prosthetic cardiac valves in pregnancy
Cardiac complications during pregnancy
Management
Summary and Conclusions

PHYSIOLOGICAL CIRCULATORY ADJUSTMENTS DURING NORMAL PREGNANCY AND LABOR

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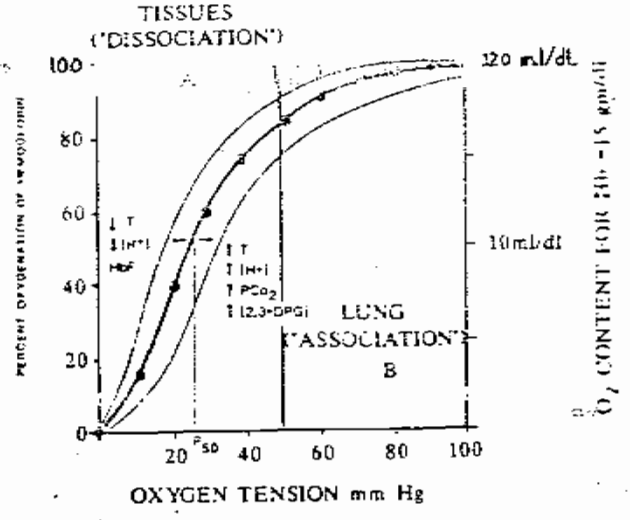
The purpose of the cardiovascular system is to deliver oxygen, hormones and nutrients to the tissues of the body and, in turn, to remove waste products from those metabolically active tissues, **[Yeomans and Hankins, 1989]**.

1. Oxyhemoglobin dissociation curve:

A thorough understanding of the oxyhemoglobin dissociation curve is essential not only to maternal physiology but to fetal physiology as well



[Brady and Duff, 1989]

The curve consists of two separate sections; a leftward or lower section representing dissociation of oxygen from hemoglobin at the tissue level and a rightward or upper portion reflecting association of oxygen with hemoglobin in the lungs. Shifts of the curve affect primarily the release of oxygen at the tissue level. Shifts to the right are caused by acidosis, hypercapnia, increased body temperature, and increased concentration of 2,3- diphosphoglycerate, and result in decreased affinity of hemoglobin for oxygen. Factors that shift the curve to the left will conversely impair oxygen release to the tissues. Therefore, alkalosis and hypothermia should be avoided, **[Yeomans and Hankins, 1989].**

In pregnancy, a state of compensated respiratory alkalosis exists. This state creates a gradient favouring CO_2 diffusion from foetus to mother.

There is about 30% increase in maternal 2,3 - diphosphoglycerate level in pregnancy which effectively counteracts the lowered PCO_2. Thus, the altered physiology ensures provision of oxygen to and removal of carbon dioxide from the foetus, **[Yeomans and Hankins, 1989].**

2. Cardiac output:

Rubler et al., [1977] used the difficult echocardiographic technique of measuring the volume changes of the left ventricle during the cardiac cycle to determine cardiac output arising by 24 - week gestation and maintained until term if the patient was studied in the left lateral position.

The most recent non-invasive technique has been to use Doppler ultrasound to measure blood velocity through blood vessel or cardiac valve orifice measured usually by M mode ultrasound in order to determine bulk flow. The pulsed Doppler technique must be considered superior to continuous wave Doppler because it can be combined with imaging transducers which also allow measurements of valve / vessel area. It was easier to obtain Doppler flows from the aorta and pulmonary artery in pregnancy, **[Robson et al., 1987]**.

More recently the application of Swan Ganz catheterization to obstetric patients has begun to yield further information, but this technique should only be performed by those skilled in its use, since there are many complications such as pneumothorax, **[Clark et al., 1985]**.

Studies of cardiac output in pregnant women with twins have shown that the increase is greater throughout pregnancy than is usual with a single foetus which is confirmed by M mode echocardiography which has shown that the extra effect of multiple pregnancy is due to increased heart rate and increased contractility rather than increased venous return, **[Veille et al., 1985]**.

In early first stage, when contractions cause a rise of intrauterine pressure little different from that before labor, a contraction can cause a transitory rise in cardiac output of as much as 2L/min, which is partly due to increased venous return caused by blood expelled from the uterus during contraction, **[Bleker et al., 1975]**.

Robson et al., [1987] used pulsed Doppler ultrasound in a study of 15 patients in labor, they showed that basal cardiac output increased from 6.9L/min in early labor to 7.5L/min at the end of the first stage.

Delivery by caesarean section may be associated with an increase in cardiac output as assessed by Doppler ultrasound but this increase in cardiac output may have related to general anaesthesia as much as the delivery process, **[Newman, 1982]**.