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Research Article

Dilated Cardiomopathy: A Heavy Heart

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Abstract

In severe dilated cardiomyopathy (DCM), the left ventricular volume is much larger than that of a normal heart (1). Thus it can accumulate a larger amount of blood in the LV cavity than normally, and thus will weigh more than the normal heart (Heavy Heart). This entity, and its relationship to aspects of congestive heart failure (CHF) are presented.

Keywords

Dilated cardiomyopathy, Heart weight, Heart failure.

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Introduction

In DCM with poor systolic function, the enlarged LV cavity can fill with more blood than normally. Thus it will weigh more than the normal heart in systole and diastole. This increased blood weight may have several adverse physiologic consequences for CHF, including increases in afterload, worsening of pulmonary functions, and implications for treatment.

Methods and Results

Measurements of LV volume in DCM and in normal hearts (all males) were obtained from standardized tables (2). Ranges of values are reported as averages. The average dry weight of the human heart is about 310 grams (3). One milliliter of blood weighs 1.106 grams.

In DCM the total weight (heart and blood) is higher by approximately 117 grams at end diastole and 42 grams at end systole compared to a normal heart. Thus the Heavy Heart weighs more than the normal heart throughout the cardiac cycle.

Table 1: Variable DCM Normal Difference.

Variable	DCM	Normal	Difference
LV end diastolic volume (ml)	210	100	110
LV end systolic volume (ml)	85	45	40
Heart dry weight (grams)	310	310	0
End diastole blood weight (grams)	223	106	117
End systole blood weight (grams)	90	48	42
End diastole total weight (grams)	533	416	117
End systole total weight (grams)	400	358	42

Discussion

The Heavy Heart seen in association with DCM may have relevance to CHF patients as follows:

Afterload: LV dilatation seen in DCM increases wall stress according to the LaPlace relationship (4). This increase in wall stress increases the LV afterload. In addition, the impaired LV now has to attempt the ejection of an increased weight of blood in the LV cavity. This increases afterload even further, and may then further weaken systolic performance.

Pulmonary Mechanics: In CHF, the diaphragm is weak due to muscle fiber atrophy and decreased thickness (5). Additionally, the Heavy Heart sits atop the left hemi diaphragm, which further impairs diaphragmatic excursion. Also the Heavy Heart in DCM causes compressive telecasts in the lower left lung base (6). All these factors may cause reduced ventilation, with abnormal gas exchange, and contribute to the shortness of breath associated with CHF.

Diuretics: Fluid overload is common in CHF. Diuretics reduce pulmonary congestion and edema. By decreasing the intravascular volume, they reduce the weight of the blood in the Heavy Heart, thus decreasing afterload and promoting better systolic ejection. However, excess diuretic may reduce the intravascular volume far enough to increase blood viscosity, which can increase afterload in an impaired LV (7). This emphasizes the importance of correct diuretic dosage. Thus in DCM, the Heavy Heart may contribute to further reduction in LV systolic performance and worsening of CHF. Further studies on this topic may be of considerable interest.

Reference

1. Japp AG, Gulati A, Stuart AC, et al. The diagnosis and evaluation of dilated cardiomyopathy. J Am Coll Cardiol. 2016; 67: 2996-3010.
2. Oh J, Seward JB, Tajik AJ. The Echo Manuel. 3rd ed. Philadelphia: Lippincott Williams Wilkins. 2006: 403.
3. Molina DK. Normal organ weights. Am J Forensic Med Path. 2012; 33: 362-367.
4. Little RC, Little WC. Cardiac preload, afterload, and heart failure. Arch Intern Med. 1982; 142: 819-822.
5. Salah HM, Goldberg LR, Jeroen M, et al. Diaphragmatic function in cardiovascular disease. J Am Coll Cardiol. 2022; 80: 1648-1659.
6. Olson TP, Johnson BP. Pulmonary function changes associated with cardiomegaly in chronic heart failure. J Card Fail. 2007; 13: 100-107.
7. Alery T, Detterich J, Philippe C, et al. Physical properties of blood and their relationship to clinical conditions. Front Physiol. 2022; 13: 85-129.