

## Heart Failure. Pathogenesis and Treatment

Edited by Jagat Narula, Renu Virmani, Manel Ballester, Ignasi Carrió, Stephen Westaby, Oh Frazier, and James T. Willerson. London: Martin Dunitz, 2002: 712 pgs; ISBN: 1-901865-84-3.

This is an extensive, profound, 700-page book, very well edited, and written by 70 authors with the participation of 9 Spanish authors, all of them Catalan with the exception of Torrent-Guasp, who is from Alicante.

The majority of the authors are authorities in the fields about which they have written, covering an extensive number of the problems related to cardiac insufficiency. The book is divided into five sections, the first covering basic aspects, the second pathogenic mechanisms, the third secondary heart failure, the fourth medical treatment, and the fifth surgical treatment.

The first chapter of the section on basic aspects of heart failure, by Arnold M. Katz, «Molecular and cellular bases of myocardial contraction,» is a very complete review of the role of  $\text{Ca}^{++}$  in contraction and relaxation, with a detailed overview of all the  $\text{Ca}^{++}$  channels and pumps with illustrative pictures and drawings. On the contrary, the motor function of myosin and actin bridges is discussed with notable simplification and brevity. And although the author specifically indicates at the end of the chapter that «the majority of the effects of ATP are to maintain the heart in a state of relaxation,» when writing about the actin-myosin interaction the role of ATP is discussed in a way that is so cryptic that if the reader has no prior knowledge of ATP action, it will probably not be understood, which is surprising from the author who introduced the concept of lusitropism or relaxation. However, the study of the movement of  $\text{Ca}^{++}$  is splendid and one of the better studies I have read in my life.

The second chapter, «Mechanics, determinants, and regulation of cardiac contraction,» by M.R. Starling, is a superficial and shallow review of such concepts as the cardiac cycle, venous return, contractility, which the author does not even attempt to define, post-load, energy consumption, and neural control, which makes detailed explanation very difficult.

The third chapter, by J.S. Ingwall, «Myocardial energy and cardiac contractility,» explains the consumption of ATP and its regeneration by the phosphocreatinine reservoir, a mechanism that has been studied exhaustively by the author. He clearly explains two facts that have not yet been incorporated by the majority of cardiologists: that ATP disassociates myosin from actin and that the generation of force coincides with the expulsion of the ADP. He also indicates that, in a mouse model of hypertrophic cardiomyopathy, the first thing to occur is diastolic dysfunction, an affirmation that is not stated again anywhere in the book.

The fourth chapter is excellent and didactic, written by M. Abdellatif and M.D. Schneider and entitled «The transcription circuits that mediate hypertrophy and cardiac insufficiency,» and the authors underline the concept that the phenotype of hypertrophy may depend more on local stress than on systemic factors; in other words, transgenic factors may be notably influenced by ventricular mechanics and the autocrine/paracrine response. And although the authors indicate the four principal paths of transgenic hypertrophy: the induction of immediate response genes, a rise in the regulation of transcription factors, transcription phosphorylation and dephosphorylation, and the last described by the authors, phosphorylation of RNA polymerase II, cardiac hypertrophy responds to multiple triggers and it is not known if there are qualitative or quantitative factors that distinguish cardiac hypertrophy from cardiac insufficiency. In the hypertrophy cascade there is an extreme functional redundancy of certain factors that make gene dissection difficult. Space limitations prevent me from commenting on the 37 chapters one by one.

The second section begins with the seventh chapter, by Christine E. Seidman, et al, «Gene mutations that cause hypertrophic cardiomyopathy,» which is an excellent review of the nine gene mutations, with their corresponding clinical information, that give rise to hypertrophic cardiomyopathy, which is a sarcomere disease, many of which are described by the chapter authors. Some commentary is missing on the physiopathology that the authors know so well and which they have studied so extensively in rodents. Chapter 14, by E. Marban et al, «The role of the expression of the ionic channels in cardiac insufficiency and in sudden death,» is a very adequate review of the little we know of the ionic changes in cardiac insufficiency. And with sudden death, since the last reference cited was published in 1998, mention of the new long QT genes is missing –only the Herg is cited – and the Brugada syndrome. And thus the primordial defect of this book, which is otherwise full of good qualities, is the lack of an up-to-date bibliography.

Something similar occurs in the magnificent chapter 18, «Apoptosis in cardiac insufficiency,» by J. Narula et al, which is an excellent and exhaustive review of the subject, with historical data that was totally unknown until now. The authors are proponents of the role that mitochondrial cytochrome C has in apoptosis, but as the bibliography is not current, discussion of the role of caspase is very vague and antiquated.

Chapter 19, by C.G. Brilla and H. Rupp, «The microcellular and myocardial remodeling of the extracellular matrix,» is magnificent, and it masterfully explains the significance of fibrosis, its mechanism and production and how it can be managed currently and in the future with treatment. The authors are the individuals who have provided almost all the information we have on the subject.

The third section begins with chapter 21, a splendid chapter by Sabin H. Rahimtoola on the hibernating myocardium, one of the new coronary syndromes; the author did not only

discover but is also one of the most knowledgeable individuals concerning this clinical syndrome and its therapeutic management, as is perfectly reflected in the chapter. The following chapter, number 22, by our compatriots G. Pons-Lladó, M. Ballester, and I. Carrió, on «Hypertensive cardiopathy and progressive myocellular loss,» is a brief and adequate description of the repercussions of hypertension and how cellular loss is related to myocardial mass, using for its quantification their anti-myosin scintigraphy technique with indio-111. Chapter 25 is excellent, by M. Ballester et al, on alcoholic heart disease, of which the authors has extraordinary personal experience, and a meticulous study of myocardial lesions, also studied via the technique of marked anti-myosine. Carrió, in chapter 28, writes a magnificent study of «Iatrogenic diseases of the myocardium,» fundamentally dedicated to the management and prevention of myocardiopathy by anthracycline, but also providing a very complete review of all the other treatment possibilities.

The fourth section concerning pharmacological treatment is poor and superficial. On the other hand, the fifth section, regarding surgery, is excellent and very complete, although cardiac transplant is not included. In chapter 36, practically the last chapter as chapter 37 contains scarcely 4 pages, is also by our compatriot Torrent-Guasp et al, and includes two editors, Ballester and Narula. It is an explanation of Torrent-Guasp anatomy with beautiful new drawings of its physiology and how this view of cardiac architecture can improve the results of the Batista segmentary ventriculectomy, as demonstrated by Caralps-Riera.

In reality, this book was written by authorities in their fields who are completely knowledgeable about the subjects they discuss; it is well edited and has excellent figures, such

as the Torrent-Guasp color figures, which are tremendously didactic. The book does have the drawback, already mentioned, of containing an out-of-date bibliography as the most recent reference cited is dated 1998 – I only found one reference from 1999 – which indicates that there must be a problem with this edition as this fault cannot be attributed to the authors, who are true experts in their fields. Evidently, this is a book for consultation by cardiologists and not for students. For example, there is not one single definition of cardiac insufficiency and such current themes as diastolic dysfunction is only treated collaterally by Narula et al in one chapter, although excellent to be sure, that concerns diabetes mellitus. Also, for someone who wishes to learn what the medical treatment of cardiac insufficiency is, this is not the most appropriate book. On the other hand, the bibliography is heterogeneous because, although in general it follows the Vancouver nomenclature, some chapters only cite magazines such as Science and others list all the authors and not just the first three.

However, this is an excellent book, very user-friendly, easy to read, with magnificent illustrations, and the basic processes are dealt with masterfully. I am personally happy to have had the opportunity to write this review because I have read the book with much pleasure and I have learned and was able to restructure many basic concepts that were disperse for me previously. In addition, I am proud of the fact that the Spanish contingent in this book is magnificent.

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