www.nature.com/clinicalpractice/cardio

Introduction

Francisco Fernández-Avilés

> "What giants?—said Sancho Panza.
> "Those you see over there," replied his master, "with the long arms; sometimes they are almost two leagues long" … And having said this, he spurred his horse, Rocinante, paying no attention to the shouts of his squire, Sancho, who warned him that, beyond any doubt, those things he was about to attack were windmills and not giants. But he was so convinced they were giants that he did not hear the shouts of his squire, Sancho, and could not see, though he was very close, what they really were …"
>
> (Miguel de Cervantes y Saavedra, *Don Quixote of la Mancha*, part 1, chapter 8)

This year marks the 400th anniversary of the publication in 1605 of Miguel de Cervantes' novel *Don Quixote of la Mancha*. The passage quoted describes the nobleman's fight against some windmills, which he believes to be evil giants. After the sail of one of the windmills throws him off his horse and to the ground, the injured Don Quixote begins to think that the forces of evil have transformed the giants into windmills out of enmity toward him. Sancho Panza, his loyal and wise squire, is unable to convince him otherwise.

Scientific thought has too often suffered the lack of realism and the excessive pride and obstinacy against which Cervantes warns us. Attitudes to cell therapy are an example. The therapeutic potential of cell progenitors is known. Researchers have also observed that vascular integrity is related to the presence of certain progenitor cells, and findings suggest that stem cells that can renew cardiac tissue exist. The use of stem cells in animals has led to discoveries compatible with the existence of myocardial and vascular regeneration, thereby leading to preliminary studies of their use in human medicine that have yielded positive results.

However, because these experimental observations contravene classical teaching and have proved difficult to reproduce, and because there have been as yet no important randomized studies to confirm the initial clinical results, it has been suggested that supporters of stem cells in the treatment of cardiovascular diseases could suffer Don Quixote's misfortune: many scientists suspect that we who have put our faith in this line of work could receive a sharp dose of reality.

This supplement gathers the latest basic and clinical experimental advances in studies of the capacity of the damaged cardiovascular structure for renewal and repair, through the transplantation of adult or embryonic stem cells, the stimulation of endogenous progenitor cells and the transfer of mitosis-promoting genes. The supplement's structure reflects many of the presentations at the Second International Symposium on Gene and Stem Cell Therapy for Heart Failure and Other Cardiovascular Diseases, held in April 2005 in Valladolid, Spain.[1] That symposium was aimed at translating cardiovascular knowledge from bench to bedside and vice versa. This supplement will help to educate preclinical researchers about how progenitor cells help to maintain and repair cardiovascular structures and how to identify, purify, and produce stem cells with therapeutic potential. Doctors specializing in cardiovascular medicine will learn more about gene transfer techniques, stimulating endogenous progenitor cells, and transplanting cells into the cardiovascular system, and about future prospects for this new therapeutic method.

The symposium, and this supplement, are aimed at helping to answer three key questions about gene and stem cell therapy: do cardiac regeneration and repair really exist, what is the best way to apply cell therapy to ischemic myocardium, and how long will it take for cell therapy to emerge as a clinical reality?

I hope that these will help readers to distinguish between a windmill and a giant.

Reference

1 Cardiovascularcelltherepy.com [http://www.cardiovascularcelltherapy.com] (accessed 30 November 2005)

F Fernández-Avilés is Professor of Cardiovascular Medicine and Head of the Instituto de Ciencias del Corazón at the Hospital-Clínico Universitario de Valladolid, Valladolid, Spain.

Acknowledgments

The Second International Symposium on Gene and Stem Cell Therapy for Heart Failure and Other Cardiovascular Diseases, and this supplement, have been supported in part by the Spanish Network for Cardiovascular Research (RECAVA) of the Instituto de Salud Carlos III (Spanish National Health Service).

Competing interests

The author declared he has no competing interests.

Correspondence

ICICOR (Instituto de Ciencias del Corazón)
Hospital Clínico-Universitario de Valladolid
Ramón y Cajal 3
47005 Valladolid
Spain
faviles@secardiologia.es

www.nature.com/clinicalpractice
doi:10.1038/ncpcardio0451