Editorial

Mini-Symposium on Stem Cells and Regenerative Medicine. Where are We and Where do We need to go?

Since the sequencing of human genome, few topics have generated as much interest and hope as stem cells in the minds of clinicians, researchers, lay public and especially those unfortunate people suffering from diseases with no known cure. Despite their undoubted potential, there is a lack of clarity about the biology behind the various cellular and metabolic processes that uniquely characterize stem cell as well as uncertainty about its exact place in clinical medicine. This is happening at a time when information, both good and bad, is increasingly easy to access. In this confused state, information overload serves to fuel misconceptions which result in exploitation of unsuspecting patients.

Research in the field of progenitor cells and regenerative medicine has gathered pace in the last decade; one sees new research papers every day. New biomedical journals have been established exclusively devoted to the study regenerative medicine. Our knowledge of the science behind stemness as well as differentiation ability which are characteristics of any stem cell has increased many fold. With the increase in this understanding also has come the realization that the clinical utility of stem cells may not be as simplistic as was initially thought. The early rather naïve concept was that these cells could somehow be induced to differentiate into the desired cell type which will then repair any injured organ or tissue. Now, we know that there are many other potential pathways through which stem cells can provide clinical benefit, and if one has to harness the full potential of this modality one needs to understand with greater clarity how one can exactly manipulate this process.

Discovery of stem cells has also opened some new fields in medicine, most notable of them is regenerative medicine which marries the concept of tissue engineering with stem cell therapy. Scientists and researchers with expertise in biomaterials, polymer science, chemistry and other similar specialities have devised new scaffolds that help and promote the growth and differentiation of these cells and hold great promise in advancing tissue repair.

Another new era in which special type of stem cells hold promise is immunomodulation, i.e. the ability to do what we currently try to achieve using potentially toxic immunosuppressive therapy. This has the potential to revolutionize treatment of autoimmune disorders and might allow us to find ways in which organ transplantation can be performed without the need of lifelong immunosuppressive therapy.

The only form of treatment using progenitor cells that is well accepted is hematopoietic cell transplantation for hematological disorders. Commonly known as bone marrow transplant, this procedure has saved the lives of large number of patients. All other types of proposed treatments using stem cells must be conducted as experimental clinical trials. A number of professional societies as well as governments have been concerned about the rampant use of purported cell therapies and the claims made by clinics that desire to make a quick buck out of desperate patients. The International Society for Stem Cell Research (ISSCR's) Task Force on Unproven Cell Therapies treatments has cautioned the public against such practices. In India, stem cell researchers have developed a set of guidelines for use of stem cells in research and therapy under the aegis of the Indian Council of Medical Research and the department of biotechnology. One hopes that this will very soon receive legal sanction.

These are exciting times and it is only right that the science of stem cells reaches as wide an audience as possible. With this in mind, we have planned this mini-symposium which will describe some of the essentials in the area of stem cells and regenerative medicine. The four articles in the symposium cover topics starting from the basics to possible futuristic use of these cells along with biomaterials. The authors are all clinicians and researchers who are currently involved in either studying or using these cells in clinical medicine.

We do hope that these will whet your appetite and stimulate the readers to find out more about this new and exciting field. We hope to be able to provide more information in future issues.

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