

Regenerative Medicine: The New Vista (Volume 4, Issue 1, January-March 2020)

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Evolution of man is a scientific fact. In ancient mythologies, be they from Greece, India, or China, there are stories of kings and emperors seeking the “fountain of youth” or “pearls” that would rejuvenate them so that they can rise above the fundamental problems of life ie, jara, byadhi, and mrityu (the problem of aging, disease, and death); why is this so? This is the fundamental question of Buddha who left his family and became a monk in search of an answer. The question remains even though science today has evolved from what was once the domain of spirituality, healers, and black magic practitioners. Many healing methods are found in the ancient literatures of traditional Chinese and Indian (Ayurveda) medicine. There are stories of kings and emperors seeking the “fountain of youth” or “pearls” that would rejuvenate them. The so-called Philosopher's Stone that medieval alchemists searched for fruitlessly was supposed not only to turn any substance into gold but also to prolong life and restore youth. Ancient Indian sages practised “Siddha Vaidya” as well as “trantric” methods for the same reason. In contemporary times, with a better understanding of the human body down to cellular structures and the DNA along with a better knowledge of debilitating diseases and their impact, scientists are looking not at rejuvenation but regeneration. A natural effect of aging is degeneration; every organ in a human body degenerates as it ages, leading ultimately to, as they say, death due to old age. Congenital defects and damage can also affect organs like the liver, the heart or the kidney, causing loss of function. Diseases like Parkinsonism or diabetes also cause specific organs for dysfunction. Many of these diseases are also associated with aging, and in today's world, improved healthcare has resulted in increasing longevity. Many significant human diseases arising from the loss or dysfunction of specific cell types in the body, such as Parkinson's disease, diabetes, and cancer, are becoming increasingly common. So far, there has been little reprieve from such debilitating diseases or from damage caused by burns or other accidents. Today, however, a new branch of medicine, regenerative medicine, shows much promise. The term probably comes from a 1992 paper of Leland Kaiser, “The Future of Multihospital Systems,” where in a paragraph subtitled “Regenerative Medicine,” the author noted that a “new branch of medicine will develop that attempts to change the course of chronic disease and in many instances will regenerate tired and failing organ systems” (Kaiser L. Top Health Care Finance, 1992 Summer; 18:4: 32-45). With work on stem cells getting a new boost in recent years, the process of regenerating dysfunctional and aging organs appears to be no longer a myth but a reality. Regenerative medicine refers to that branch of medicine which deals with living functional tissues that help to repair or replace damaged or aging tissues, thus regenerating the organ concerned. Research in this field includes cell therapy involving stem cells or progenitor cells, induction of regeneration by biologically active molecules, tissue transplantation, tissue engineering, and the use of cord blood, to mention a few. Regenerative therapies have been demonstrated (in trials or in the laboratory) to heal broken bones, burns, blindness, deafness, heart damage, nerve damage, etc. It has the potential to cure diseases through repair or replacement of damaged, failing, or aged tissue. Therapies include regeneration of tissues in vitro for future use in vivo as well as direct placement and regeneration Preface x of tissue in vivo. However, this area of medicine is still in its infancy despite the strides made in the last decade. Much of the work is still confined to animal or laboratory models. The next few years are critical as more and more human trials are undertaken and the true potential of this emerging branch of medicine is expressed. The present concepts has further broadened the focus to include a

variety of non-foetal sources of stem cells and their fascinating role in regenerative medicine. Menstrual blood stem cells, adipose tissue stem cells, stem cells from spongy gum tissue, and even stem cells from breast milk are discussed. Scientists from all over the world have participated in this academic collaboration. This article brings together some of the important work that is being done along with unpublished observations that will help to shape the contours of future therapy in the field of modern regenerative medicine. It promises to be an eye-opener to the enormous potential of hitherto discarded material, like menstrual blood or liposuction material, uprooted decidual teeth, or the operated spongy gum tissue, that had been so far considered as pure biological waste. It is well known that menstrual blood can rejuvenate a rose tree and its use to attract the lover when you mix it with coffee as per voodoo practice or Baul initiation tradition. The question is what is common in it? Science of botany can support the application of blood or other nitrogenous substances, which can help the growth of the plant in particular. In case of voodoo practice of adding menstrual blood to hot coffee to attract the lover, the stem cell or cytokine niche would be destroyed by the presence of the hot coffee and there would be doubts about the residual pheromone and the residual impact, but still people of that faith are practising this. Similarly, the menstrual blood of menarche is an important ingredient for the initiation process of the secretive practice of the "Baul" faith, if the concept works as a stimulant to professionals and clinical scientists who can build on the knowledge and expand the curative potential of pregnancy-specific biological substances.