JARIP 第１２回大会：論文原稿

[1] Subject

'Social Risk-Benefit Analysis of iPS/Stem Cells Application to Medical Treatment'

[2] Abstract

First, this paper describes the mechanism for iPS cells, including comparison between iPS cells and embryonic stem (ES) cells. Second, the discussion of the features of risk and benefit on iPS/Stem is explained. Third, a brief review is made on the current status and issues concerning development of therapeutic drag for intractable diseases such as AD (Alzheimer disease) and ALS. Fourth, the brief examination of the application to organ transplantation is made, because the procurement of the donor organ has been so limited that the dependence on organ transplantation could not be any longer. Finally, analyzing the cost drivers of iPS cells application for medical treatment as well as its cost effectiveness through comparing them with the standing medical treatment, including dialytic therapy by modeling. I put forward a suggestion to cover its efficacy risk with our public health insurance system, which is similar to excess of loss coverage, because statistical data and evidences are not available now, but for making alive better with enjoying advantage of scale in economics in the future.

[3] Key Words

iPS/Stem cells, tumor risk, therapeutic drag, intractable diseases, AD, organ transplantation, cost-driver, dialytic therapy, efficacy risk, health care insurance, excess of loss cover, economic advantage of scale

[4] Back ground

Induced pluripotent stem cells (iPSCs) can be generated from somatic cells such as skin cells and blood cells through the introduction of reprogramming factors and are able to give rise to cells of any type in the body and proliferate indefinitely in culture. Since Professor S. Yamanaka received the Nobel Prize in Physiology or Medicine 2012, it has been demonstrated that mouse and human fibroblasts can be reprogrammed into an embryonic stem cell-like state by introducing a combination of four transcription factors or four genes (so-called Yamanaka factors) bearing the complicated abbreviations Oct4, Sox2, c-Myc and Klf4, which are fibroblast homologous gene of human origin. As Mr. T. Tachibana said "This is a kind of time machine" what iPS stem cells do, in effect, is to turn the biological clock back. It is one of the well-known dogmas of biology that no