CHAPTER VI

1. CONCLUSION

Stem cell-based therapy is evolving as a therapeutic strategy for treating many neurodegenerative diseases. As embryonic stem cells have numerous disadvantages, adult mesenchymal stem cells are favourable candidate for cell based therapeutic approaches. Bone marrow mesenchymal stem cells are one of the best-characterized MSCs that were primarily considered as “master” MSCs for treating various diseases. However, due to its painful, invasive procedure that give fewer yield of MSCs along with lower proliferation rate and differentiation capacity, there is a need to search for the substitute MSCs source with easy isolation procedure as well as with comparable or even better neuroprotective potential than commonly used BM-MSCs. In our current study, we observed that the anti-apoptotic potential of hDPSCs were better than hBM-MSCs in an excitotoxic in vitro and in vivo conditions. The present study, demonstrated that hDPSCs/hBM-MSCs, their CM and exosomes could protect hippocampal neurons against excitotoxicity through neurotrophic factors-PI3K-Bcl-2 cell survival pathway. Thus, our study illustrates the proof-of-principle on utilizing MSC based “cell free” therapy for treating neurodegenerative diseases.
2. SALIENT FEATURES

➢ Human DPSCs/hBM-MSCs and their secretome are neuroprotective.
➢ Human DPSCs and its secretome has better anti-apoptotic potential.
➢ Human DPSCs and its secretome possess better anti-neuroinflammatory property.
➢ Human DPSCs and its secretome possess better neurogenic potential.
➢ Human DPSCs and its secretome based cell therapy assist in early hippocampal functional recovery.

3. LACUNAE OF THE STUDY

➢ The status of the transplanted MSCs in the degeneration milieu is not addressed.
➢ The contents of the exosomes that is rendering neuroprotection (which might include specific miRNAs, shRNAs) is not addressed.
➢ Neuroprotection mediated by exosomes derived from hDPSCs/hBM-MSCs in an in vivo condition has to be addressed.