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Immunosuppressive properties of mesenchymal stromal cells derived from amnion, placenta, Wharton's jelly and umbilical cordS Manochantr¹, Y U-pratya, P Kheolamai, S Rojphisan, M Chayosumrit, C Tantrawatpan, A Supokawej, S Issaragrisil

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Abstract

Background: The role of bone marrow-derived mesenchymal stromal cells (BM-MSC) in preventing the incidence and ameliorating the severity of graft-versus-host disease (GvHD) has recently been reported. However, as the collection of BM-MSC is an invasive procedure, more accessible sources of MSC are desirable.

Aim: This study aimed to explore the alternative sources of MSC from amnion, placenta, Wharton's jelly and umbilical cord, which are usually discarded.

Methods: MSC from those tissues were isolated using mechanical dissociation and enzymatic digestion. Their capacity for proliferation and differentiation, and ability to suppress alloreactive T-lymphocytes were studied and compared with those of BM-MSC.

Results: MSC derived from amnion, placenta, Wharton's jelly and umbilical cord were similar to BM-MSC regarding the cell morphology, the immunophenotype as well as the differentiation ability. These MSC also elicited a similar degree of immunosuppression, as evidenced by the inhibition of alloreactive T-lymphocytes in the mixed lymphocyte reaction, compared with that of BM-MSC. MSC from umbilical cord and Wharton's jelly had a higher proliferative capacity, whereas those from amnion and placenta had a lower proliferative capacity compared with BM-MSC.

Conclusion: The results obtained from this study suggest that MSC from amnion, placenta, Wharton's jelly and umbilical cord can therefore be potentially used for substituting BM-MSC in several therapeutic applications, including the treatment of GvHD.

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