Perbandingan tube formation sel punca mesenkimal manusia asal jaringan lemak dengan asal sumsum tulang untuk menilai potensi vaskulogenesis = Comparison of tube formation between human adipose and bone marrow-derived mesenchymal stem cells to evaluate vasculogenesis

Panjaitan, Ani Oranda, author

Abstrak

Latar Belakang: Uji tube formation merupakan uji paling luas yang digunakan sebagai uji vaskulogenesis/ angiogenesis secara in vitro. Sel punca mesenkimal atau mesenchymal stem cell MSC merupakan sel punca dewasa yang multipoten. Efek parakrinnya terhadap neovaskularisasi sudah banyak diketahui. Secara umum MSC diketahui tidak mengekspresikan penanda permukaan hematopoetik CD34 namun ada pendapat yang menyatakan bahwa MSC secara in vivo mengekspresikan CD34 dan kehilangan ekspresinya saat dikultur secara in vitro. MSC asal lemak dianggap masih memiliki ekspresi CD34 pada kultur in vitro pada pasase awal oleh beberapa ahli. MSC yang paling banyak digunakan dalam uji tube formation adalah BM-MSC padahal ASC juga berpotensi bagi terapi dan rekayasa sel punca. Hingga saat ini potensi vaskulogenesis antara ASC dan BM-MSC masih belum jelas mana yang lebih baik dan apakah ekspresi CD34 mempengaruhi hal ini. Pada penelitian ini kami ingin membandingkan potensi vaskulogenesis antara MSC asal lipoaspirat dengan MSC asal sumsum tulang melalui uji tube formation dan ekspresi CD34.
Hasil: Pengukuran kualitas vaskulogenesis menunjukkan bahwa rerata panjang tube lebih tinggi pada BM-MSC, rerata jumlah loop lebih banyak pada BM-MSC dan rerata jumlah titik percabangan lebih banyak pada BM-MSC. Tidak ditemukan kadar CD34 yang tinggi pada ASC.
Kesimpulan: BM-MSC memiliki kemampuan lebih baik dalam membentuk tube formation dibandingkan dengan ASC. Tidak ditemukan hubungan antara kadar CD34 dengan kemampuan vaskulogenesis MSC.
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Objective: Test tube formation is the most widely used method as an in vitro vasculogenesis test. Mesenchymal stem cells MSC is a multipotent adult cells known not expressing CD34 just like endothelial progenitor cells EPC that play a role in vasculogenesis. Adipose derived stem cells MSCs ASC is considered to still express CD34 2 in cultures. Bone Marrow BM MSCs is most widely used MSCs in vasculogensis research. ASC has great potential for stem cell therapy and engineering. The potential of vasculogenesis between ASC and BM MSC remains unclear which one is better and whether CD34 expression affects this. In this study we wanted to compare the potential of vasculogenesis between MSC of lipoaspiric origin and MSC from bone marrow through tube formation test and CD34 expression. Tube formation assay is the most widely used method as an in vitro vasculogenesis test. Mesenchymal stem cells MSCs are multipotent adult cells. known not to express CD34 surface marker which is expressed by haemapoietic stem cells, but according to some experts bone marrow mesenchymal stem cells BM MSCs express CD34 in vivo and lose its expression when they are cultured in vitro, while adipose derived stem cells ASCs still have CD34 expression in the early passages when cultured in vitro. BM MSCs are the most widely used MSC, but ASCs are also used in stem cell therapy and tissue engineering for angiogenesis purposes. Until now the potential of vasculogenesis between ASCs and BM MSCs is still unclear. Expression of CD34 is also

unknown whether effecting the quality of tube formation. In this study we wanted to compare the potential of vasculogenesis between ASC and BM MSCs through tube formation test and CD34 expression.
Results: Measurements of vasculogenesis quality showed higher tube length, number of loops and mean number of branch points on BM MSC. Both BM MSCs and ASCs showed low CD34 levels.
Conclusion: BM MSCs showed better tube formation ability compared with ASCs. No association was found between CD34 levels and MSC vasculogenesis capability.