Efek sekretom Sel Punca Mesenkimal asal jaringan adiposa donor usia muda dan tua terhadap sel fibroblas yang diinduksi UVB = Effect of secretome of Mesenchymal Stem Cells from adipose tissue in young and old donors on fibroblast cells induced by UVB

Anabel Abiyyah Nugroho, author

Abstrak

Sel punca adiposa (SPA) telah menjadi sumber pengobatan terkini yang menjanjikan. Penelitian terbaru menunjukkan bahwa mekanisme yang mendasari manfaat sel punca sebagai pengobatan berhubungan dengan efek modulasi parakrin daripada pemberian sel punca itu sendiri. Beberapa penelitian tentang SPA telah melaporkan adanya perubahan dalam jumlah, proliferasi, dan potensi diferensiasi, serta adanya penurunan sitokin dan growth factor pada SPA sehubungan dengan usia donor. Penelitian ini bertujuan untuk menyelidiki perubahan sekretom berdasarkan kelompok usia tua dan muda serta dampaknya terhadap sel fibroblas yang diinduksi UVB. Sel punca adiposa dari donor usia tua dan muda dikultur dan diisolasi untuk diambil sekretomnya. Sel fibroblas yang diinduksi UVB kemudian diinkubasi dengan sekretom sel punca adiposa tersebut. Parameter seperti viabilitas sel dan konsentrasi TGF-1 pada sekretom sel punca adiposa serta presentase apoptosis, sel mati, ekpresi gen MMP-3 dan COL1A pada sel fibroblas yang diinduksi UVB dan diberikan sekretom usia donor berbeda dievaluasi untuk menilai efek perbedaan usia donor tersebut. Hasil penelitian menunjukan bahwa sekretom sel punca adiposa dengan usia donor berbeda memberikan dampak yang berbeda pada sel fibroblas yang diinduksi UVB. Konsentrasi TGF-1 pada sekretom SPA asal donor usia muda lebih tinggi dibandingkan dengan SPA donor tua. Persentase apoptosis, sel mati dan ekpresi gen MMP-3 terhadap GAPDH lebih tinggi pada sel fibroblas yang diinduksi UVB dan diberi sekretom SPA donor tua dibandingkan dengan yang diberi sekretom SPA donor muda. Ekpresi gen COL1A lebih rendah pada pada sel fibroblas yang diinduksi UVB dan diberikan sekretom SPA donor tua dibandingkan diberikan sekretom SPA donor muda. Oleh sebab itu, dapat disimpulkan adanya penurunan kemampuan sekretom sel punca adiposa usia donor tua dalam memperbaiki penuaan pada sel fibroblas yang dipajan dengan UVB, berdasarkan morfologi sel, presentase sel apoptosis dan sel mati serta ekpresi MMP-3 dan COL1A terhadap GAPDH.

.....Adipose stem cells (ASC) have become a promising source of current treatment. Recent research suggests that the mechanisms underlying the benefits of stem cells as a treatment relate to paracrine modulatory effects rather than the administration of stem cells themselves. Several studies on ASC have reported changes in the number, proliferation and differentiation potential, as well as a decrease in cytokines and growth factors in ASC in relation to donor age. This study aims to investigate secretome changes based on young and old age groups and their impact on UVB- induced fibroblast cells. Adipose stem cells from young and old donors were cultured and isolated for secretome collection. The UVB-induced fibroblast cells were then incubated with the secretome of the adipose stem cells. Parameters such as cell viability and TGF-1 concentration in the secretome of adipose stem cells as well as the percentage of apoptosis, dead cells, MMP-3 and COL1A gene expression in fibroblast cells induced by UVB and given the secretome of different donor ages were evaluated to assess the effect of differences in donor age. The results showed that the secretome of adipose stem cells with different donor ages had different impacts on UVB-induced

fibroblast cells. The concentration of TGF-1 in the secretome of SPA from young donors was higher compared to ASC from old donors. The percentage of apoptosis, cell death and expression of the MMP-3 gene against GAPDH was higher in fibroblast cells induced by UVB and given the SPA secretome of old donors compared to those given the ASC secretome of young donors. COL1A gene expression was lower in fibroblast cells induced by UVB and given the ASC secretome of old donors compared to those given the ASC secretome of young donors. Therefore, it can be concluded that there is a decrease in the ability of the secretome of adipose stem cells from old donors to improve aging in fibroblast cells exposed to UVB, based on cell morphology, the percentage of apoptotic cells and dead cells as well as the expression of MMP-3 and COL1A against GAPDH.