Age-related changes of apoptotic cell death in human lymphocytes

Author(s) Schindowski, K; Leutner, S; Müller, W E; Eckert, A
Author(s) at UniBasel Eckert, Anne ;
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Apoptosis seems to be involved in immunosenescence associated with aging. Moreover, in lymphocytes (PBL) of patients with Alzheimer's disease, an increased susceptibility to the apoptotic pathway has been described possibly due to impaired protection of oxidative stress. Accordingly, it seemed to be of particular interest to investigate the contribution of normal aging to the susceptibility from human lymphocytes to programmed cell death. We could show that PBL from elderly individuals (>60 years) accumulate apoptosing cells to a significant higher extent in spontaneous and activation-induced cell death compared to younger controls (<35 years). Treatment with the oxidative stressor 2-deoxy-D-ribose or with agonistic-CD95-antibody pronounced this effect even more implicating a higher sensitivity to reactive oxygen species and a higher functional CD95 expression, respectively. In addition, expression of the activation markers HLA-DR and CD95 was significantly increased in CD3+-cells of aged subjects, while expression of CD25 did not seem to be affected by age. Expression of Bcl-2 was increased in aging and correlated with the number of apoptotic cells.

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