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Enhanced Cytotoxic Effect of Expanded NK Cells with IL12 and IL15 from Leukoreduction Filter on K562 Cell Line Exhibits Comparable Cytotoxicity to Whole Blood

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Abstract : Natural killer (NK) cells are innate immune effectors that play a pivotal role in combating tumors and infected cells. In recent years, the therapeutic potential of NK cells has gained significant attention due to their remarkable cytotoxic ability. This study focuses on investigating the cytotoxic effect of expanded NK cells enriched with interleukin 12 (IL12) and interleukin 15 (IL15), derived from the leukoreduction filter, on the K562 cell line. Firstly, NK cells were isolated from whole blood samples obtained from healthy volunteers. These cells were subsequently expanded ex vivo using a combination of feeder cells, IL12, and IL15. The expanded NK cells were then harvested and assessed for their cytotoxicity against K562, a well-established human chronic myelogenous leukemia cell line. The cytotoxicity was evaluated using flow cytometry assay. Results demonstrate that the expanded NK cells significantly exhibited enhanced cytotoxicity against K562 cells compared to non-expanded NK cells. Interestingly, the expanded NK cells derived specifically from IL12 and IL15-enriched leukoreduction filters showed a robust cytotoxic effect similar to the whole blood-derived NK cells. These findings suggest that IL12 and IL15 in the leukoreduction filter are crucial in promoting NK cell cytotoxicity. Furthermore, the expanded NK cells displayed relatively similar cytotoxicity profiles to whole blood-derived NK cells, indicating their comparable capability in targeting and eliminating tumor cells. This observation is of significant relevance as expanded NK cells from the leukoreduction filter could potentially serve as a readily accessible and efficient source for adoptive immunotherapy. In conclusion, this study highlights the significant cytotoxic effect of expanded NK cells enriched with IL12 and IL15 obtained from the leukoreduction filter on the K562 cell line. Moreover, it emphasizes that these expanded NK cells exhibit comparable cytotoxicity to whole blood-derived NK cells. These findings reinforce the potential clinical utility of using expanded NK cells from the leukoreduction filter as an effective strategy in adoptive immunotherapy for the treatment of cancer. Further studies are warranted to explore the broader implications of this approach in clinical settings.

Keywords : natural killer (NK) cells, Cytotoxicity, Leukoreduction filter, IL-12 and IL-15 Cytokines
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