Lei Xiao, J Blood Disord Transfus 2017, 8:2 (Suppl)
DOI: 10.4172/2155-9864-C1-024

Lei Xiao

Innovative Cellular Therapeutics Co., Ltd., China

Potent anti-leukemia activities of chimeric antigen receptor modified T (CAR-T) cell therapy in Chinese patients with relapsed/refractory hematological malignances

Background: Patients with relapsed/refractory hematological malignances, including acute lymphocytic leukemia as well as lymphoma, have a poor prognosis. Chimeric antigen receptor modified T cells against CD19 have displayed anti-malignance activities. Autologous CD19CAR-T performed in our clinical trials induced remission in patients with r/r hematological malignances. 41 subjects (from 10 clinical centers, in China) with r/r B-ALL and two subjects with non-Hodgkin's Lymphoma (NHL) were treated by autologous CD19 murine CAR-T cells (NCT 02813837). Another two subjects with r/r B-ALL were treated by autologous CD19 humanized CAR-T cells.

Methods: 41 subjects with r/r B-ALL and two subjects with r/r NHL were treated with murine CAR-T cells from May 8, 2015 to January 30, 2017, while three subjects with r/r B-ALL were treated with humanized CAR-T cells from December 16, 2016 to December 27, 2016. Both the murine and humanized CAR-T cells were infused with dose range between 0.45 × 106 CAR-T cells/kg and 10.51 × 106 CAR-T cells/kg. All subjects were monitored closely during the trial. Both murine and humanized CAR-T cells were prepared according to in-house built robust protocol to ensure quality.

Results: Following treatment with CD19 murine/humanized CAR-T cells, the proliferation of CAR-T cells were detected with both qPCR and flow cytometry techniques in blood and bone marrow samples in all clinical subjects. 34/41(82.93%) subjects with B-ALL achieved complete remission (CR) between 7 to 14 days after murine CD19 CART cell infusion, and 33/41(80.49%) subjects arrived at MRD negative. Additionally, Severe Cytokine Release Syndrome (CRS) was observed in 12 subjects (29.3%) and another 21 subjects have shown low-grade CRS symptoms (51.2%). Severe CRS subjects were adequately managed by anti-IL6R Tocilizumab and corticosteroid anti-inflammatory drugs. Two subjects with NHL achieved CR after CD19 murine CAR-T cells infused and neither of them suffered from irreversible neurotoxicity. Both two subjects with B-ALL treated with humanized CAR-T cells achieved CR as well as MRD negative.

Conclusions: This is the first multicentre report to our knowledge of successful treatment of r/r B-ALL with CD19 CAR T cells in China. Even r/r B-ALL with high-burden leukaemia patients also was effective and associated with a high remission rate after autologous CD19 CAR-T infusion (NCT 02813837). In addition, though the follow-up is short, CD19 murine CAR-T cells showed potent efficacy in subjects with NHL, meanwhile subjects with r/r B-ALL might benefit from CD19 humanized CAR-T cells therapy.

Biography

Lei Xiao is the Chairman and CSO of Innovative Cellular Therapeutics Co., Ltd. His research interests include chimeric antigen receptor T cells therapy, iPS cell technology & human embryonic stem cells and Gene therapy. During October 2005 - September 2010 he worked as Principal Investigator in Shanghai Institute of Biochemistry and Cell Biology. During January 2007 - September 2010, he was the Director of Cell Bank/Stem Cell Bank of Chinese Academy of Sciences, Shanghai Institute for Biological Sciences. He was a Professor at Zhejiang University from 2010 to 2015. From August 2009 to present, he is a Chief Science Officer at the Innovative Cellular Therapeutics Co., Ltd., which was formerly Shanghai SiDanSai Biotechnology Co, Ltd.

liwenjing@sidansai.com