Immunotherapy improves remission for relapsed, refractory leukemia: Clinical trial

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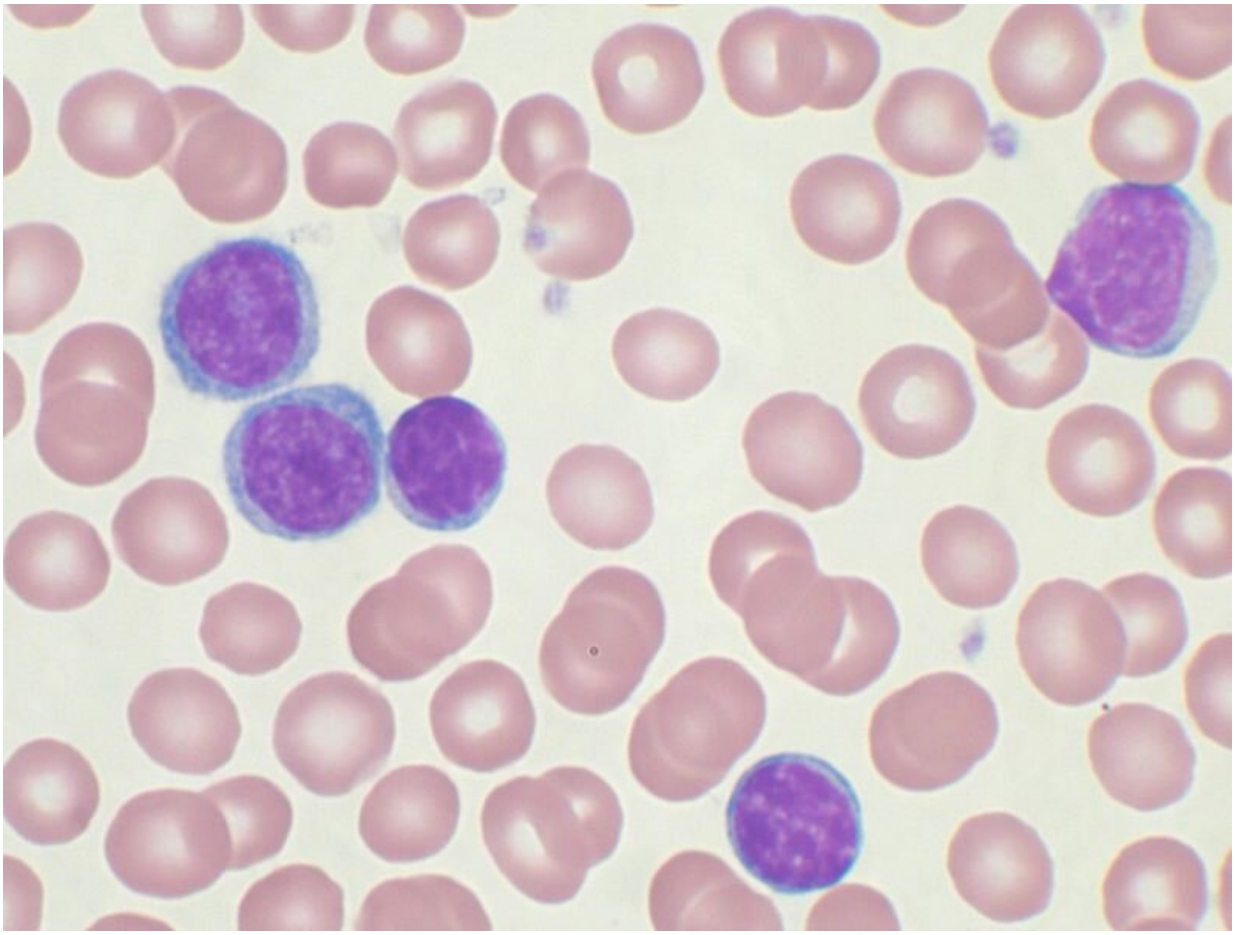

High-power magnification (1000x) of a Wright's stained peripheral blood smear showing chronic lymphocytic leukemia (CLL). The lymphocytes with the darkly staining nuclei and scant cytoplasm are the CLL cells. Credit: Mary Ann Thompson/Wikimedia Commons, CC BY-SA

A single infusion of chimeric antigen receptor T-cell (CAR-T) therapy induced complete response or remission in patients with relapsed or refractory chronic lymphocytic leukemia (CLL) or small lymphocytic lymphoma (SLL), according to a recent clinical trial published in *The Lancet*.

"CAR-T therapy uses the patient's own immune cells to fight cancer. This novel form of cellular immunotherapy has been a major advance in the treatment of relapsed B-cell lymphomas. Here we reported the first multi-center study of Liso-cel, a CAR-T therapy in CLL/SLL," said Shuo Ma, MD, '00 Ph.D., professor of Medicine in the Division of Hematology and Oncology and a co-author of the study.

CLL and SLL are essentially the same disease, and is the most common type of leukemia in adults. Both CLL and SLL are caused by cancerous white bloods cells called lymphocytes. In CLL, the lymphocytes originate in bone marrow and in SLL, they're found in the lymph nodes.

The landscape for CLL/SLL treatment has evolved significantly over the past decade, with oral targeted therapies (BTK inhibitors and Bcl-2 inhibitors) replacing conventional immunochemotherapy to become the new standard of care.

Although these targeted therapies are highly effective in CLL/SLL, there are high-risk patients who eventually become refractory, or resistant, to the treatment. Patients who've failed both classes of targeted therapies (double-refractory CLL/SLL) are left with few treatment options and poor outcomes, underscoring a need for better treatments.

In the current study, investigators aimed to evaluate the efficacy and safety of a CAR T-cell therapy, specifically lisocabtagene maraleucel (liso-cel), in 117 adult patients with relapsed or refractory CLL or SLL who received an average of five previous lines of therapy. CAR T-cell

therapy employs genetically enhanced T-cells to locate and destroy cancer cells more effectively.

For the trial, all patients received a one-time intravenous infusion of liso-cel at one of two dosage levels. Among the 49 patients with double-refractory CLL/SLL who received the higher dosage, the overall response rate was 47%, and the complete response and remission rate was 18%, comparing favorably to a historical rate of zero to 5%, according to Ma.

Time to response was about one month and of the patients who achieved complete response and remission, none had relapsed at a 20-month follow up, indicating the durability of the response, according to the authors.

Transient immune-related adverse effects were commonly observed after the liso-cel treatment. More significant (grade 3) adverse events including cytokine release syndrome (an acute systemic inflammatory syndrome) were reported in 9% of patients, and advanced neurological events were reported in 18% of patients.

Overall, the findings suggest that a one-time infusion of liso-cel can induce a rapid and durable response in patients with relapsed and refractory CLL or SLL who have exhausted other treatment options, Ma said.

"CAR-T therapy is a very promising future treatment option for our patients with CLL/SLL. Future studies are being planned to compare this novel treatment with the existing standard treatments," said Ma, who is also a member of the Robert H. Lurie Comprehensive Cancer Center of Northwestern University.

More information: Tanya Siddiqi et al, Lisocabtagene maraleucel in

chronic lymphocytic leukaemia and small lymphocytic lymphoma (TRANSCEND CLL 004): a multicentre, open-label, single-arm, phase 1–2 study, *The Lancet* (2023). DOI: 10.1016/S0140-6736(23)01052-8