

B-cell lymphoma: New treatment option doubles survival time compared to chemotherapy

Study published in New England Journal of Medicine

(Vienna, 04 December 2018) So-called CAR-T cell therapy is a promising option for treating around a fifth of patients with diffuse large B-cell lymphoma. That is the main finding of the multi-centre JULIET study, in which researchers from the Comprehensive Cancer Centre (CCC) of MedUni Vienna/Vienna General Hospital participated. In CAR-T cell therapy, previously modified T-cells recognise a specific protein on the surface of the tumour. This in turn triggers destruction of the tumour cells. This introduces a new option for treating such patients, besides the conventional standard treatment (chemotherapy). Because: the two-year survival rate following standard treatment is only 20%, whereas, with CAR-T cell therapy, overall survival was doubled to 40%. The results of this study have now been published in the prestigious "New England Journal of Medicine".

With 480 new cases a year, diffuse large cell B-cell lymphoma is the commonest type of lymphoma (cancer of the lymph cells) in Austria. Moreover, it is a very aggressive disease, which is normally treated with a combination of chemotherapy and immunotherapy. Around 50% of cases are permanently cured with this regime, the other half suffering a relapse, for which there has hitherto been no satisfactory treatment.

Immune system permanently modified

A potential new treatment could now help these people: CAR-T cell therapy. This is a targeted therapy directed against the protein CD19. CD19 is found on the surface of tumour cells in 90% of relapsed patients.

In CAR-T cell therapy, the T-cells are removed by blood dialysis and genetically modified in a special device, in that a receptor capable of docking onto CD19 is attached to their surface. In the third stage of the therapy, the modified T-cells are multiplied and returned to the patient by infusion. The modified T-cells are now able to recognise the tumour cells and so destroy them. Since the T-cells remain in the body and continue to multiply, they are permanently available to recognise and destroy newly occurring cancer cells with the surface characteristic CD19.

Says Ulrich Jäger, Head of the Division of Hematology and Hemastatology at the Department of Medicine I of MedUni Vienna/Vienna General Hospital, member of the CCC and principal investigator of the JULIET study in Austria: "Our study shows that CAR-T cell therapy is a ground-breaking treatment option that enables us to permanently cure the disease, even in previously hopeless cases."

Special know-how required

Since CAR-T cell therapy provokes a strong immune response, the treatment is administered on an in-patient basis, so that patients can be closely monitored. Says Jäger: "The procedure is very complex and can only be implemented in an interdisciplinary context. MedUni Vienna is one of the few centres in Europe capable of performing this treatment. We are therefore maintaining an active scientific exchange with other centres. These include, for example, St. Anna Children's Cancer Research in the field of CAR-T cell therapy for childhood leukaemia."

The next steps

The next goal for the researchers led by Ulrich Jäger is to find out why 40% of patients respond to CAR-T cell therapy, and are cured, while the remaining 60% do not; and, of course, how this situation can be rectified. It is planned to conduct a study into this, building on the JULIET study. Says Jäger: "We are expecting that the procedure can also be used for many other indications. With this major field of study, MedUni Vienna is positioning itself as a centre for cell therapy, where even complex treatments and procedures can be carried out."

Service: "Tisagenlecleucel in Adult Relapsed or Refractory Diffuse Large B-Cell Lymphoma"

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