Predicting late effects after childhood cancer treatment

In Sweden alone, there are 300 new cases of childhood cancer each year. The five-year survival rate of these children is currently a strong 80% in the western world. However, being cured from the cancer comes with a price. Cancer treatments usually involve irradiation, chemotherapy and/or surgery which can have serious side effects, on these patients later on in their lives. The field of late effects after childhood cancer is growing and developing as the number of survivors is increasing. In Europe 300,000 to 500,000 individuals are childhood cancer survivors and the number increases by approximately 12,000 each year. In recent years, accomplishments, thanks to joint international efforts, have resulted in more evidence based knowledge of what childhood cancer patients are at risk for.

During the last years Helena Linge has participated in a large-scale research project led by Lars Hjorth (Dept Pediatrics, LU) involving 11 European countries, with the goal to find links between previous cancer treatment in childhood and late effects like subsequent primary neoplasms and cardiac events.

Helena Linge, PhD, IKVL, Lund University, has now received a grant from Vinnova to support research in identifying novel relationships between primary cancer treatments and late complications in patients who were treated for childhood cancer.

The project builds on a registry, which contains treatment data on all patients having survived childhood cancer diagnosed between 1970 and 2015, an initiative by Thomas Wiebe, pediatric oncologist and associate professor in Paediatrics. The population based registry covers all of southern Sweden. In collaboration with a business intelligence company a search tool has enabled clinical outreach to risk group patients. With joint efforts between Lund university and the Late Effects Clinic this opportunity enables more accurate medical follow up. Exposure to radiation therapy to the chest in childhood is now known to increase the risk of developing breast cancer compared to the normal population. Thanks to the search tool a group of 48 women were identified in the registry.

- The Late Effects Clinic reached out to these women with information about the risks and their need to receive accurate medical follow-up. Through this work, we discovered two new cases of breast cancer which previously were unknown. In addition, two other women in the group had already developed breast cancer and had received treatment.

What makes the registry unique is that the data in the registry stretches back almost 50 years since the primary treatments in the patients. This makes it very useful as the effects of childhood cancer treatments may occur after several decades.

With the Vinnova grant, Helena Linge is hoping to gain new knowledge with the cross disciplinary input from experts in artificial intelligence (AI). This could provide new information.
patients who are at risk of developing novel late effects may be identified and can possibly be offered preventive treatment.

- It is important to me, that this project aims to benefit the patients. It may also open up new avenues for research which ultimately can lead to the discovery of novel therapies with less side effects, says Helena Linge.

- Joakim Hising