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Press release

For immediate publication

**Investigation of spinal cord tumors in children and adolescents
Med Uni Graz scientists provide comprehensive characterization**

Graz, 23 September 2021. Tumors of the central nervous system are the most common solid tumors in childhood and adolescence and are divided into low-grade and high-grade malignant tumors depending on their malignancy grade. They mainly occur in the brain but can also affect the spinal cord. A study by Med Uni Graz researchers that was published in the renowned journal *Neuro-Oncology* is dedicated to a specific tumor: low-grade glioma of the spinal cord. The comprehensive characterization of this type of cancer delivers important findings for how to best plan future therapy studies.

When the nervous system proliferates

A glioma is one of a group of cancers that develops from glial cells. These cells perform important roles in supporting tissue, insulating nerve cells and transporting nutrients and fluids. They can also undergo a series of changes—including malignant ones. Pooling their expertise with researchers from Austria, Germany and Switzerland, Med Uni Graz researchers have taken a look at the course of low-grade gliomas in 128 children and adolescents in order to obtain better insight into the course and the treatment of this disease.

As its name indicates, low-grade glioma (LGG) is malignant to a lesser degree and grows relatively slowly. This type of tumor mainly occurs in the brain but can also affect the spinal cord. Although the overall survival rate of young patients is nearly 100%, in most cases low-grade gliomas are a "chronic" disease. Patients often have relapses, which is why it is all the more important for their quality of life that the best possible therapy methods are discovered and explored.

A closer look at patients

The study in which Med Uni Graz scientists played a leading role took a look at the medical history and treatment of 128 children and adolescents with LGG of the spinal cord and observed how their health status has changed over the course of time. It explored what therapies were the most successful in the long term. The researchers laid the cornerstone on which other methods and treatments can be established.

In comparison to a low-grade glioma in the brain, a glioma in the spinal cord is usually more aggressive. After many years of stability, the disease advances—and sometimes several times—and also has a greater tendency to form metastases or to develop into a higher-grade malignant tumor.

Treatment of the disease is complicated. "The primary goal should always be to remove as much of the tumor as possible since (as we were able to show) the risk for a relapse or

disease progression decreases as more of the tumor tissue is removed. Such an operation is often very difficult or even impossible. To achieve the best results without any neurological complications, treatment should be provided at specialized centers and also take into consideration any long-term consequences for spinal growth," says Thomas Perwein.

The study shows that in the majority of the 128 patients who were observed, the disease progressed over the course of the observation period, even years after the last treatment. More than a third of the patients required more than one type of therapy (operation, chemotherapy, radiation). According to Thomas Perwein, the right time and the type of therapy must be well thought out with regard to the long-term progression of the disease and potential long-term consequences of therapy.

"In the event of a relapse or progression of the disease that requires treatment, another resection attempt should be made or at least a biopsy including molecular genetics analysis of the tumors should be done. This would yield important findings regarding the biology of these tumors and would also help to identify any existing molecular 'targets' for additional targeted therapy," explains Thomas Perwein.

Lessons for the future

The study provides an overview of the most successful treatments that keep this rare type of tumor under control. The analysis serves as a guideline for treating physicians so they can provide young patients with the best treatment possible.

The research also delivers leads for future studies. "Based on retrospective molecular genetics data from this study, further research should be done in the future on the biology of low-grade gliomas of the spinal cord in children and adolescents and also with regard to possible connections between genetic changes and clinical parameters. The relatively high rate of spinal LGG that progresses to a higher-grade, malignant tumor that was observed in this study provides the basis for our current project that explores the extremely rare phenomenon of malignant change from low-grade to high-grade gliomas in childhood and adolescence," says Thomas Perwein.

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Profile: Thomas Perwein

Thomas Perwein completed his medical degree at Med Uni Graz in 2010 and was named Best in Class. Since completing his training as an emergency physician, general practitioner and specialist in pediatrics and adolescent medicine, he has worked as a pediatric hematologist and oncologist at the Division of Paediatric Hematology/Oncology. In addition, he is currently working on his doctorate in medical science at Med Uni Graz.

The publication: High frequency of disease progression in pediatric spinal cord low-grade glioma (LGG): management strategies and results from the German LGG study group | Neuro-Oncology | Oxford Academic