

Study sheds light on why therapy for devastating brain cancer in kids often fails

Helen Branswell, **THE CANADIAN PRESS**  Wednesday, February 15, 2012 3:22 PM



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TORONTO - When a devastating form of brain cancer in kids spreads — and it too often does — treatments are life-changing and often ineffective. A new study is shedding light on why.

The work, led by a scientist at Toronto's Hospital for Sick Children, has found that in medulloblastoma, the small tumours that spread to other parts of the brain and spine aren't genetically like the main tumour from which they came. So treatments that target the main tumour often fail to shut down the secondary cancers, called metastases.

"We've been studying the wrong part of the disease all this time," said Dr. Michael Taylor, a pediatric neurosurgeon and senior scientist at Sick Kids.

"And that explains why a lot of the targeted therapies work in the dish," he continued, referring to the petri dishes used in laboratories.

"In the dish we can cure the disease because we're only studying the primary tumour. But then when we give the drugs to the kids they're not working on the metastases."

The work, reported Wednesday in the journal *Nature*, will be a wake-up call for the research community, said Dr. Poul Sorensen, an expert in the genetics of childhood cancers who is a senior scientist at the B.C. Cancer Research Centre and the University of British Columbia.

"People have always supposed that the primary tumour and the metastatic tumour are quite similar. And so that if you understand the primary tumour you'll know how to treat the secondary tumour. But in fact, this study shows that that's not the case," Sorensen said.

"It's slapping the research community in the face by saying ... we need to focus on the genetic changes, the drivers of metastatic disease, to hope to treat that compartment of the disease."

Medulloblastoma is rare, but tragic. It can be diagnosed at any time, but is most commonly seen in babies and around the age of seven. The Canadian Cancer Society says about 60 children a year are diagnosed with this form of brain cancer in Canada, and about half survive.

But the child who survives is not the child his or her parents knew before the diagnosis. To prevent or slow the spread of secondary tumours, children who've had surgery to remove the primary medulloblastoma undergo high dose radiation. Their entire brains and spinal columns are blasted, with heart-rending results.

Taylor doesn't sugar-coat the effects, saying the radiation can lead to physical deformities and can lower the child's IQ by as many as 30 points. "It's not trivial. We're not going from an A to an A- here."

Nancy Goodman's son, Jacob Froman, was eight when he was diagnosed with the disease. He went from being a happy, active child to one who was incontinent, couldn't speak properly, had cognitive impairment and was wheelchair bound. "After the surgery he was never the same," said Goodman from Washington, D.C., where she lives.

Jacob was not treated at Sick Kids, but Goodman had consulted with Taylor during her son's illness. After he died at age 10, his mother donated tissues from Jacob's cancer to Taylor for his research. Jacob's cancers were among the tissues used for this study, she said.

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Goodman started a non-profit organization, Kids v Cancer. One of the programs it runs encourages parents of children with cancer to donate their tissues for research.

"It is something we can do to prevent another family from losing a child the way we did. That Dr. Taylor made the scientific insights that he did based on my son's tissue is just such an achievement," she said.

Taylor's study was funded by the Canadian Cancer Society, which applauded the findings.

"Anything we can do to better understand the cancer itself and better treat these kids with more targeted treatments is incredibly worthwhile," said Christine Williams, vice-president for research.

Taylor said the field will now need to look for therapies that work against the secondary tumours. He noted there is already a drug on the market that might be useful and should be tested. If it's found to be effective that would vastly speed up the process of adopting it for use in medulloblastoma.

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