Bone Cancers May Be Hidden in Children Long Before Diagnosis

A new study could help shape how these cancers are diagnosed and treated.

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Bone cancer accounts for about 3 percent of childhood cancers. Now, new research published in the journal Science reveals that some children's bone cancers remain hidden for years before they're diagnosed, reports the Wellcome Sanger Institute.

For the study, researchers sequenced and analyzed the genomes of 124 tumors to understand the genetic events that lead to the fusing together of two specific genes (EWSR1 and ETS) in Ewing sarcoma, the second most commonly diagnosed bone cancer in children and young adults. (Gene fusions are often disease-defining events in cancer, researchers noted.)

"Many childhood sarcomas are driven by gene fusions. However, until now, we have not known how or when these key events occur, or whether these processes change at relapse," said Adam Shlien, PhD, one of the study's lead authors.

Shlien is associate director of translational genetics and a scientist in genetics and genome biology at SickKids, as well as co-director of the SickKids Cancer Sequencing Program.

While it was previously believed that Ewing sarcoma was a rapid growing cancer, scientists discovered that the complex DNA rearrangements responsible for Ewing sarcoma had taken place years before diagnosis.

"In principle, this study provides evidence that Ewing sarcoma could be detectable earlier, possibly even before it reveals itself as disease," said Sam Behjati, PhD, one of the study's lead authors from Wellcome Sanger Institute and the University of Cambridge Department of Pediatrics. "If we could detect these childhood cancers sooner, when tumors are smaller, they would be much easier to treat."

What's more, researchers also found that the complex genetic rearrangements make Ewing sarcoma more aggressive than cancers with simple gene fusions. If the cancer were to return, different treatment would be needed.

The results of this study open the door for finding ways to screen for childhood bone cancers in an

effort to treat them sooner rather than later.

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