Dear Alice,

My father has schizophrenia. My great grandmother was manic-depressive. What are the genetic risks of my child being schizophrenic if I have one? Are there any tests that can be done either before becoming pregnant or prenatally to determine probability? Has a gene been found linked to schizophrenia?

Answer

Dear Reader,

When different health conditions run in the family, it's not unusual to want to learn more about them and how genetics may impact the risk of others in the family being diagnosed with these conditions in the future. Schizophrenia is a psychotic disorder — a group of mental illnesses marked by hallucinations (such as visual, auditory, or tactile, for example) and other psychotic symptoms — affecting about one percent of the population throughout the world. Both men and women are at equal risk of having the illness, which tends to appear in men in their early- to mid-twenties and women in their late twenties. Bipolar disorder (formerly known as manic-depression), on the other hand, is a mood disorder. Genetics may play a role in developing either disorder, so your children may be at a higher risk, but there are plenty of other factors at play, as well. At this time, there aren't any tests that can be done to determine the probability of future children living with schizophrenia. If you're looking for more information about bipolar disorder, you can read more in the Q&A Bipolar disorder: Am I at risk? [2]. Otherwise, read on for more about schizophrenia and the role genetics (and other factors) play in its heritability.

Before getting into the nitty-gritty of the genetics, it'll be helpful to understand some of the basics about schizophrenia. The signs and symptoms of schizophrenia may vary person-to-person (and even day-to-day), but typically include a combination of delusions, hallucinations, disorganized speech, and impaired functioning. People with schizophrenia often experience a distorted sense of reality and may present as fearful, withdrawn, or disorganized in speech and action, which may make it challenging for others to make sense of their behavior. This has historically led to the assumption that those with schizophrenia are violent or dangerous to others. However, they're actually more likely to be the victims of violence themselves than they are to be perpetrators. While many people with schizophrenia episodically experience these symptoms,
they may actually lead mostly typical lives during the intervals between those episodes with the help of antipsychotic medication, a pharmaceutical treatment for schizophrenia that can help subdue symptoms of the disease. Alongside pharmaceutical treatments, psychosocial therapy is also effective in treating schizophrenia and typically includes assistance with daily functioning, individual psychotherapy, and psychoeducation for the family. Ultimately, schizophrenia is a condition that can be managed.

Even so, schizophrenia has a complex symptomology and carries considerable stigma, which may make it particularly difficult to watch a loved one experience the disease or worry that you, yourself, may ultimately receive a diagnosis. To speak further to your question, an abundance of genes have been found to be associated with schizophrenia. However, it’s currently unknown which of them might be responsible for the increased probability. Some hypotheses related to genetics exist but require further exploration. For example, some of these genes are implicated with dopamine-releasing neurons. Moreover, copy number variants (CNVs) are genes that have been duplicated or deleted and some genes with CNVs have been associated with schizophrenia. As far as probability goes, the most commonly cited statistic indicates that you have a one in ten chance of having schizophrenia if your parent does, but more current research may indicate that this isn’t entirely accurate. Given that so much is still unknown about schizophrenia and genetics, there aren’t existing tests that can help determine your risk, and the verdict is out on the level of risk as well.

Any future children may be at higher risk of being diagnosed with schizophrenia than the general population because of your genetic makeup. However, genes are only one piece of the puzzle in determining likelihood of developing the illness, and a host of other factors exist and may contribute. With that being said, research also highlights the role of environmental factors, including living in an urban area, being an immigrant (though the mechanisms for this are still being studied), obstetrical complications (such as exposure to substances that can affect neurological development), late winter and early spring birth (perhaps reflecting exposure to influenza virus and other viruses or infections during neural development), and advanced paternal age at conception (which may be associated with an increased risk of mutations). Similar to nearly any other illness that’s more recently been linked to genetics, familial background is only one factor out of many that may contribute to risk. Ultimately, so much about the causes of schizophrenia is still unknown. What is known is this: genetic probability isn’t fate.

Best wishes,

Alice!

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