Schizophrenia

Subjects: Genetics & Heredity
Contributor: Peter Tang

Schizophrenia is a brain disorder classified as a psychosis, which means that it affects a person's thinking, sense of self, and perceptions. The disorder typically becomes evident during late adolescence or early adulthood.

Keywords: genetic conditions

1. Introduction

Signs and symptoms of schizophrenia include false perceptions called hallucinations. Auditory hallucinations of voices are the most common hallucinations in schizophrenia, but affected individuals can also experience hallucinations of visions, smells, or touch (tactile) sensations. Strongly held false beliefs (delusions) are also characteristic of schizophrenia. For example, affected individuals may be certain that they are a particular historical figure or that they are being plotted against or controlled by others.

People with schizophrenia often have decreased ability to function at school, at work, and in social settings. Disordered thinking and concentration, inappropriate emotional responses, erratic speech and behavior, and difficulty with personal hygiene and everyday tasks can also occur. People with schizophrenia may have diminished facial expression and animation (flat affect), and in some cases become unresponsive (catatonic). Substance abuse and suicidal thoughts and actions are common in people with schizophrenia.

Certain movement problems such as tremors, facial tics, rigidity, and unusually slow movement (bradykinesia) or an inability to move (akinesia) are common in people with schizophrenia. In most cases these are side effects of medicines prescribed to help control the disorder. However, some affected individuals exhibit movement abnormalities before beginning treatment with medication.

Some people with schizophrenia have mild impairment of intellectual function, but schizophrenia is not associated with the same types of physical changes in the brain that occur in people with dementias such as Alzheimer disease.

Psychotic disorders such as schizophrenia are different from mood disorders, including depression and bipolar disorder, which primarily affect emotions. However, these disorders often occur together. Individuals who exhibit strong features of both schizophrenia and mood disorders are often given the diagnosis of schizoaffective disorder.

2. Frequency

Schizophrenia is a common disorder that occurs all over the world. It affects almost 1 percent of the population, with slightly more males than females developing the disorder.

3. Causes

Variations in many genes likely contribute to the risk of developing schizophrenia. In most cases, multiple genetic changes, each with a small effect, combine to increase the risk of developing the disorder. The ways that these genetic changes are related to schizophrenia are not well understood, and the genetics of this disease is an active area of research. The genetic changes can also interact with environmental factors that are associated with increased schizophrenia risk, such as exposure to infections before birth or severe stress during childhood.

Deletions or duplications of genetic material in any of several chromosomes, which can affect multiple genes, are also thought to increase schizophrenia risk. In particular, a small deletion (microdeletion) in a region of chromosome 22 called 22q11 may be involved in a small percentage of cases of schizophrenia. Some individuals with this deletion have other features in addition to schizophrenia, such as heart abnormalities, immune system problems, and an opening in the roof of the mouth (cleft palate), and are diagnosed with a condition called 22q11.2 deletion syndrome.

3.1. The genes and chromosome associated with Schizophrenia

- AKT1
- COMT
- YWHAE
- chromosome 22

4. Inheritance

The inheritance pattern for schizophrenia is usually unknown. The risk of developing schizophrenia is somewhat higher for family members of affected individuals as compared to the general public; however, most people with a close relative who has schizophrenia will not develop the disorder themselves.

5. Other Names for This Condition

- dementia praecox

References

1. Barker V, Bois C, Johnstone EC, Owens DG, Whalley HC, McIntosh AM, Lawrie SM. Childhood adversity and cortical thickness and surface area in a population atfamilial high risk of schizophrenia. Psychol Med. 2016 Mar;46(4):891-6. doi:10.1017/S0033291715002585. Epub 2015 Dec 14. Citation on PubMed
2. Debost JP, Larsen JT, Munk-Olsen T, Mortensen PB, Meyer U, Petersen L. JointEffects of Exposure to Prenatal Infection and Peripubertal Psychological Traumain Schizophrenia. Schizophr Bull. 2017 Jan;43(1):171-179. doi:10.1093/schbul/sbw083. Epub 2016 Jun 24. Citation on PubMed
3. Escudero I, Johnstone M. Genetics of schizophrenia. Curr Psychiatry Rep. 2014 Nov;16(11):502. doi: 10.1007/s11920-014-0502-8. Review. Citation on PubMed
4. Farrell MS, Werge T, Sklar P, Owen MJ, Ophoff RA, O'Donovan MC, Corvin A,Cichon S, Sullivan PF. Evaluating historical candidate genes for schizophrenia.Mol Psychiatry. 2015 May;20(5):555-62. doi: 10.1038/mp.2015.16. Epub 2015 Mar 10.Review. Citation on PubMed or Free article on PubMed Central
5. Giusti-Rodríguez P, Sullivan PF. The genomics of schizophrenia: update andimplications. J Clin Invest. 2013 Nov;123(11):4557-63. doi: 10.1172/JCI66031.Epub 2013 Nov 1. Review. Citation on PubMed or Free article on PubMed Central
6. Gulsuner S, Walsh T, Watts AC, Lee MK, Thornton AM, Casadei S, Rippey C,Shahin H; Consortium on the Genetics of Schizophrenia (COGS); PAARTNERS StudyGroup, Nimgaonkar VL, Go RC, Savage RM, Swerdlow NR, Gur RE, Braff DL, King MC,McClellan JM. Spatial and temporal mapping of de novo mutations in schizophrenia to a fetal prefrontal cortical network. Cell. 2013 Aug 1;154(3):518-29. doi:10.1016/j.cell.2013.06.049. Citation on PubMed or Free article on PubMed Central
7. Kavanagh DH, Tansey KE, O'Donovan MC, Owen MJ. Schizophrenia genetics:emerging themes for a complex disorder. Mol Psychiatry. 2015 Feb;20(1):72-6. doi:10.1038/mp.2014.148. Epub 2014 Nov 11. Citation on PubMed
8. Purcell SM, Moran JL, Fromer M, Ruderfer D, Solovieff N, Roussos P,O'Dushlaine C, Chambert K, Bergen SE, Kähler A, Duncan L, Stahl E, Genovese G,Fernández E, Collins MO, Komiyama NH, Choudhary JS, Magnusson PK, Banks E, ShakirK, Garimella K, Fennell T, DePristo M, Grant SG, Haggarty SJ, Gabriel S, ScolnickEM, Lander ES, Hultman CM, Sullivan PF, McCarroll SA, Sklar P. A polygenic burdenof rare disruptive mutations in schizophrenia. Nature. 2014 Feb13;506(7487):185-90. doi: 10.1038/nature12975. Epub 2014 Jan 22. Citation on PubMed or Free article on PubMed Central
9. Schizophrenia Working Group of the Psychiatric Genomics Consortium. Biologicalinsights from 108 schizophrenia-associated genetic loci. Nature. 2014 Jul24;511(7510):421-7. doi: 10.1038/nature13595. Epub 2014 Jul 22. Citation on PubMed or Free article on PubMed Central
10. Sekar A, Bialas AR, de Rivera H, Davis A, Hammond TR, Kamitaki N, Tooley K,Presumey J, Baum M, Van Doren V, Genovese G, Rose SA, Handsaker RE; SchizophreniaWorking Group of the Psychiatric Genomics Consortium, Daly MJ, Carroll MC,Stevens B, McCarroll SA. Schizophrenia risk from complex variation of complement component 4. Nature. 2016 Feb 11;530(7589):177-83. doi: 10.1038/nature16549. Epub2016 Jan 27. Citation on PubMed or Free article on PubMed Central

11. Sullivan PF, Daly MJ, O'Donovan M. Genetic architectures of psychiatricdisorders: the emerging picture and its implications. Nat Rev Genet. 2012 Jul10;13(8):537-51. doi: 10.1038/nrg3240. Review. Citation on PubMed or Free article on PubMed Central