

News & Comments

This Epilepsy and Migraine Drug Cause Birth Defects

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Birth defects are caused by epilepsy and migraine drugs, according to a study. Taken during pregnancy, valproic acid, a drug used for treating epilepsy, migraines, and bipolar disorder, can cause birth defects.

There are many indications for VPA besides epilepsy and migraine, and many women, who consume VPA have given birth to infants with birth-related defects like spina bifida, facial alterations, heart malformation, cognitive impairment, and Autism Spectrum Disorder.

By the use of organoids – a 3D cluster of lab-grown human cells, and mice scientists have studied the effects of VPA on embryonic cells. The study found that in neuroepithelial cells, which are stem cells that give rise to the nervous system, VPA induces cellular senescence. Researchers have found that valproic acid slows down neural development by inhibiting the growth and division of nerve cells.

VPA-induced senescence is known to be caused by a particular molecule, p19Arf, the study suggests. This particular gene that code for p19Arf which otherwise remains inactive is left rogue in the embryo by VPA. Normally this gene becomes active in adulthood and sweeps away cancerous cells from the body. The presence of this molecule in embryos, however, delays the development of the nervous system and drives cells into senescence.

Researchers found that a large number of neuroepithelial cells in the mice and organoids showed senescence, but the effect would probably be patchier in human embryos. The team hopes that in the future, they can repeat their lab experiments using a valproic acid regimen that is more realistic, meaning a long-term and low-dose treatment

KEYWORDS

valproic acid, Sodium valproate, Organoids, Microcephaly, Embryos, Phenotypes, Senescence, Somite, RNA sequencing, Midbrain, Aging, Autism

