Alzheimer's Disease Can Be Transmitted From One Person To Another During Certain Medical Procedures

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In a groundbreaking small study, researchers identified individuals with Alzheimer's disease whose condition was actually initiated by a medical procedure. Alzheimer's disease is partially attributed to the **slow buildup of amyloid-beta and tau proteins in the brain.** This accumulation initiates a series of events **culminating in the demise of brain cells.** But, a recent study offered potentially the first clinical proof that **these protein "seeds" can be transferred from one person to another**, inducing the disease. It's crucial to note, however, that this transmission happened under a highly unusual and specific medical scenario.
"*This is not transmissible in the sense of a viral or bacterial infection. You can't catch Alzheimer's disease by living with somebody with Alzheimer's, being a carer or healthcare worker, because the 'seeds' of the disease can't be transmitted that way*," explained Dr. John Collinge, the study's co-senior author and neurology professor at University College London.

Rather, the research examined eight individuals from the UK who received a specific medical treatment during their childhood that is now outlawed in numerous countries. From 1959 to 1885, they were treated with human growth hormone (hGH) derived from the brains of deceased humans. This treatment, aimed at addressing growth hormone deficiency, was particularly common in the U.K., the U.S., and France until it was prohibited in several countries during the 1980s. Subsequently, synthetic alternatives of hGH were introduced as replacements.

The hormone derived from cadavers was eventually prohibited after it was linked to fatalities from Creutzfeldt-Jakob disease (CJD)-a type of **prion** disease characterized by the buildup of abnormal proteins in the brain. Among the most well-known prion diseases is one that impacts cattle, commonly referred to as "**mad cow disease.**" Prions are proteins that function as "seeds" of disease, prompting normal proteins to misfold into detrimental shapes. These prions cluster together, forming lengthy fibers that eventually turn into plaques, akin to the process by which amyloid-beta and tau proteins accumulate and expand in the brain in cases of Alzheimer's.

In earlier studies, the researchers examined the brains of individuals who passed away from CJD after being treated with hGH obtained from cadavers. Alongside the indicators of CJD, these brains also showed signs of amyloid-beta pathology. However, since these individuals died at a relatively young age, it remained uncertain whether they had begun to exhibit Alzheimer's symptoms or if such symptoms would have been overshadowed by the effects of CJD. The researchers noted in the study that individual postmortem examinations of patients treated with hGH serviced from cadavers hinted at **the possibility of Alzheimer's being transmissible in this manner**. Still, until this study, such a transmission had not been verified in living individuals.

So, during the latest study, the team conducted clinical evaluations on eight people who received hGH from cadavers but did not contract CJD. Of these, five exhibited symptoms of early-onset dementia, with the onset of symptoms ranging from ages 38 to 55. Additionally, the researchers examined the proteins in the cerebrospinal fluid, which surrounds the brain and spinal cord of patients, ultimately finding more proof that supported an Alzheimer's diagnosis in two of the patients. Furthermore, the research team analyzed brain tissue samples from a patient who passed away during the study and identified indicators of Alzheimer's disease pathology. Through genetic testing, they eliminated the likelihood that genes linked to early onset Alzheimer's were responsible for the dementia observed in the patients, although they were unable to obtain this genetic information for two of the individuals.

The study's authors pointed out that other factors, including the medical conditions that initially called for the hGH treatments, might have impacted the patients' risk for Alzheimer's. Nonetheless, the sole common risk factor identified was **their treatment with hGH during childhood**. The most prevalent type of Alzheimer's is the sporadic form, which accounts for 90% of cases and typically appears after the age of 60. There is also no evidence to suggest that this widespread form of Alzheimer's ever stems from medical procedures.

Despite that, this new research implies that, although extremely uncommon, **Alzheimer's has the potential to be transmitted in a manner similar to prion diseases.**
Theoretically, there's a possibility for the accidental transfer of Alzheimer's "seeds" through other medical interventions. So, the researchers suggest that new safeguards be implemented to mitigate this risk.