Topic Brief: CRISPR Gene Editing for ADHD

Date: 10/19/2022
Nomination Number: 1017

Purpose: This document summarizes the information addressing a nomination submitted on October 5, 2022, through the Effective Health Care Website. This information was used to inform the Evidence-based Practice Center (EPC) Program decisions about whether to produce an evidence report on the topic, and if so, what type of evidence report would be most suitable.

Issue: The nominator for this topic requested that primary research be conducted to determine whether CRISPR-Cas9 gene editing may be beneficial for patients with attention deficit hyperactivity disorder (ADHD).

Findings: The EPC program synthesizes and appraises existing evidence and does not support primary research. In the absence of studies to support this question, this nomination does not meet the criteria for appropriateness

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Background

Attention deficit hyperactivity disorder (ADHD) is one of the most common neurodevelopmental disorders, often discovered in childhood and lasting into adulthood.[1] According to statistics from the Centers for Disease Control and Prevention, the all-time number of children every diagnosed with ADHD is approximately 6 million based on data from 2016-2019.[2] A 2019 guideline from the American Academy of Pediatrics on the treatment for ADHD in children and adolescents recommends a combination of behavior therapy and medication for children over the age of six. For children under the age of six, behavioral therapy alone is recommended.[3]

Clustered regularly interspaced short palindromic repeats, commonly known as CRISPR, is a relatively new technology that can be used to selectively modify the DNA of living organisms.[4] As part of this modification process, the CRISPR-Cas9 enzyme scans DNA, identifies the genetic sequence for a preselected match, and cuts or otherwise modifies the selected stretch of DNA. This technology has the potential for broad applicability but is still in the early stages of development for medical use in humans. As of 2021, the Food and Drug Administration approved human trials of CRISPR-based therapy for sickle cell disease,[5] and clinical trials are being conducted for other conditions, including lung cancer and genetic blindness.[6]

While it is possible that CRISPR may be explored as a treatment for ADHD in the future, we were unable to find any clinical trials underway testing the effectiveness of CRISPR to treat ADHD.[7]

Assessment Methods

We assessed nomination for priority for a systematic review or other AHRQ EHC report with a hierarchical process using established selection criteria. Assessment of each criteria determined the need to evaluate the next one.

1. Determine the *appropriateness* of the nominated topic for inclusion in the EHC program.
2. Establish the overall *importance* of a potential topic as representing a health or healthcare issue in the United States.
3. Determine the *desirability of new evidence review* by examining whether a new systematic review or other AHRQ product would be duplicative.
4. Assess the *potential impact* a new systematic review or other AHRQ product.
5. Assess whether the *current state of the evidence* allows for a systematic review or other AHRQ product (feasibility).
6. Determine the *potential value* of a new systematic review or other AHRQ product.

References

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Conflict of Interest: None of the investigators have any affiliations or financial involvement that conflicts with the material presented in this report.

Acknowledgements

Christine Chang
Lisa Winterbottom
Emily Gean

This report was developed by the Scientific Resource Center under contract to the Agency for Healthcare Research and Quality (AHRQ), Rockville, MD (Contract No.

HHSA 290-2017-00003C). The findings and conclusions in this document are those of the author(s) who are responsible for its contents; the findings and conclusions do not necessarily represent the views of AHRQ. No statement in this article should be construed as an official position of the Agency for Healthcare Research and Quality or of the U.S. Department of Health and Human Services.

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