# Infusion reactions to adeno-associated virus (AAV)-based gene therapy: Mechanisms, diagnostics, treatment and review of the literature

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July 12, 2023

**Abstract**

The use of adeno-associated virus (AAV) vectors in gene therapy has demonstrated great potential in treating genetic disorders. However, infusion-associated reactions (IARs) pose a significant challenge to the safety and efficacy of AAV-based gene therapy. This review provides a comprehensive summary of the current understanding of IARs to AAV therapy, including their underlying mechanisms, clinical presentation, and treatment options. Toll-like receptor activation and subsequent production of pro-inflammatory cytokines are associated with IARs, stimulating neutralizing antibodies and T-cell responses that interfere with gene therapy. Risk factors for IARs include high titers of pre-existing neutralizing antibodies, previous exposure to AAV, and specific comorbidities. Clinical presentation ranges from mild flu-like symptoms to severe anaphylaxis and can occur during or after AAV administration. There are no established guidelines for pre- and post-administration tests for AAV therapies, and routine laboratory requests are not standardized. Treatment options include corticosteroids, plasmapheresis, and supportive medications such as antihistamines and acetaminophen, but there is no consensus on the route of administration, dosage, and duration. This review highlights the inadequacy of current treatment regimens for IARs and the need for further research to improve the safety and efficacy of AAV-based gene therapy.

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`Figure. Notarte2023-AAV-Gene-Therapy-_KIN3.docx` available at https://authorea.com/users/638461/articles/654258-infusion-reactions-to-adeno-associated-virus-aav-based-gene-therapy-mechanisms-diagnostics-treatment-and-review-of-the-literature

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