Article type: Editorial

Home Page URL: https://www.alliedacademies.org/virology-research/

SVR in special populations: Children, pregnant women, and immuno compromised patients.

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Received: *04-Apr-2025, Manuscript No. AAVRJ-25-171342;* ***Editor assigned:*** *05-Apr-2025, PreQC No. AAVRJ-25-171342(PQ);* ***Reviewed:*** *19-Apr-2025, QC No. AAVRJ -23-11210;* ***Revised:*** *23-Apr-2025, Manuscript No. AAVRJ -23-171342(R);* ***Published:*** *30-Apr-2025, DOI:10.35841/aavrj-9.2.193*

Introduction

Sustained virologic response (SVR) is the cornerstone of hepatitis C virus (HCV) therapy, defined as undetectable HCV RNA in the blood 12 weeks after completing antiviral treatment. Achieving SVR is considered a virologic cure and is associated with reduced risks of liver-related complications, hepatocellular carcinoma (HCC), and mortality. While direct-acting antivirals (DAAs) have revolutionized HCV treatment with cure rates exceeding 95% in the general population, special populations—children, pregnant women, and immunocompromised patients—present unique challenges and considerations. This article explores SVR outcomes, treatment strategies, and clinical implications in these vulnerable groups [1].

Historically, pediatric HCV treatment relied on pegylated interferon and ribavirin, which were poorly tolerated and yielded modest SVR rates. The approval of DAAs for children has dramatically improved outcomes. Clinical trials of sofosbuvir/ledipasvir and glecaprevir/pibrentasvir in children aged 3–17 have shown SVR rates above 95%.DAAs are well tolerated in pediatric populations, with minimal adverse effects compared to interferon-based regimens. Limited access to pediatric formulations, delayed diagnosis, and stigma remain barriers to treatment. Early treatment in children prevents long-term liver damage and improves quality of life. Universal screening and expanded access to DAAs are essential for pediatric HCV elimination [2].

Pregnancy presents a complex scenario for HCV management due to concerns about fetal safety and vertical transmission. DAAs are not currently approved for use during pregnancy due to insufficient safety data. Treatment is typically deferred until postpartum. The risk of mother-to-child transmission is approximately 5–6%, higher in women co-infected with HIV. Preliminary studies suggest that DAAs may be safe during pregnancy, but randomized controlled trials are needed. Achieving SVR before conception or postpartum reduces the risk of transmission and liver disease progression. Future research may support safe DAA use during pregnancy, transforming care for HCV-positive mothers [3].

Immunocompromised individuals—including those with HIV, organ transplants, cancer, or autoimmune diseases—face unique challenges in achieving SVR. DAAs are highly effective in HIV/HCV co-infected patients, with SVR rates comparable to mono-infected individuals. Careful management of antiretroviral therapy is required to avoid interactions with DAAs. Immunosuppressive therapy can complicate HCV treatment and increase the risk of graft rejection. DAAs have shown excellent SVR rates in transplant recipients, improving graft survival and reducing fibrosis progression [4].

HCV treatment may be delayed during chemotherapy, but SVR is achievable with careful coordination. Clearing HCV reduces hepatic complications and improves eligibility for cancer therapies. Immunocompromised patients are also at risk for chronic hepatitis E virus (HEV), which may mimic HCV and complicate diagnosis. Reduction of immunosuppression and ribavirin therapy are used for chronic HEV, though ribavirin is contraindicated in pregnancy. Achieving SVR in immunocompromised patients improves overall survival, reduces liver-related morbidity, and enhances quality of life. Multidisciplinary care is essential to navigate drug interactions and immune-related risks. SVR is a critical endpoint in HCV

therapy, but its achievement in special populations requires tailored approaches: Universal screening in pregnancy and pediatric populations can identify candidates for early intervention. Ensuring availability of pediatric formulations and affordable DAAs is vital for global HCV elimination. More data are needed on DAA safety in pregnancy, long-term outcomes in children, and SVR durability in immunocompromised hosts. Guidelines must evolve to reflect emerging evidence and support treatment in special populations [5].

Conclusion

Sustained virologic response remains the gold standard for HCV cure, offering transformative benefits across populations. In children, SVR prevents lifelong liver disease. In pregnant women, it reduces transmission risk and protects maternal health. In immunocompromised patients, it improves survival and enables broader medical care. As DAA therapies continue to evolve, expanding access and tailoring treatment to special populations will be key to achieving global HCV eradication.

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Citation: Kononov N. SVR in special populations: Children, pregnant women, and immuno compromised patients. Virol Res J. 2025;9(2):193