



## Original Research Article

# Off-label Use of Ledipasvir-Sofosbuvir in a 10-Year-Old Pediatric Patient: A Case Report

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**Abstract:** Chronic hepatitis C virus (HCV) infection in pediatric patients presents unique treatment challenges due to limited options and the evolving nature of antiviral approvals. This article reports an off-label usage of ledipasvir-sofosbuvir in a 10-year-old with genotype 4 chronic HCV, covering clinical reasoning, dosing, monitoring, therapeutic efficacy, safety profile, and practical considerations. Broader literature experience on pediatric use is examined to contextualize the case. Illustrative data on efficacy and adverse events in the pre-adolescent population are provided.

**Keywords:** Pediatric hepatitis C, Ledipasvir-sofosbuvir, Genotype 4 HCV, Off-label antiviral use, Direct-acting antivirals (DAAs).

## INTRODUCTION

HCV infection in children is a significant but under-recognized global health concern. While direct-acting antiviral (DAA) therapies have revolutionized adult treatment, pediatric approvals have historically lagged. Ledipasvir-sofosbuvir (LDV/SOF) combination is now approved for some pediatric age groups; however, clinical scenarios may warrant off-label use, especially in children younger than guideline cut-offs or in those with special comorbidities<sup>[1][2][3]</sup>.

## CASE PRESENTATION

### Patient Details

- **Age/Sex:** 10 years, male.
- **Weight:** 29 kg.
- **Clinical Context:** Diagnosed with vertically transmitted genotype 4 chronic HCV. No prior antiviral therapy. No evidence of cirrhosis on imaging, normal growth and development, negative for coinfections.
- **Indication for Off-Label DAA:** Lack of response to interferon-based regimens and limited access to pediatric-formulated alternatives.

### Therapeutic Decision

- **Drug Regimen Chosen:** Ledipasvir 45mg / Sofosbuvir 200mg daily (weight-based dosing for children  $\geq 17$ kg and  $< 35$ kg)<sup>[4]</sup>.

- **Treatment Duration:** 12 weeks (standard for genotype 1 or 4 without cirrhosis)<sup>[3][4]</sup>.
- **Basis for Dose:** Literature supports safety and efficacy in children aged 6–11 years, even though product label at the time specified age  $\geq 12$  or weight  $\geq 35\text{kg}$ <sup>[2][5][4]</sup>.

#### Monitoring and Outcome

- **Clinical Monitoring:** Monthly examination and assessment for adverse drug reactions.
- **Virological Monitoring:** HCV-RNA titres at baseline, week 4, end of treatment, and 12 weeks post-therapy (SVR12).
- **Safety Labs:** CBC, liver/renal function, electrolytes at baseline and periodic intervals.

## RESULTS

- **Efficacy:** HCV RNA became undetectable by week 4. SVR12 achieved.
- **Biochemical Response:** ALT, AST normalized by week 4; remained within reference throughout.
- **Adverse Events:** Transient headache and fatigue in initial weeks, resolving spontaneously. No laboratory or clinical adverse events necessitating treatment interruption.

**Table 1. Case Timeline and Key Laboratory Results**

| Timepoint   | HCV RNA (IU/mL) | ALT (U/L) | Adverse Events         |
|-------------|-----------------|-----------|------------------------|
| Baseline    | 1,100,000       | 68        | None                   |
| Week 4      | Undetectable    | 24        | Mild fatigue, headache |
| End of Rx   | Undetectable    | 19        | None                   |
| 12-week SVR | Undetectable    | 20        | None                   |

## DISCUSSION

#### Literature Review of Ledipasvir-Sofosbuvir in Young Children

- **Efficacy:** Across clinical studies in children aged 6 to <12 years, ledipasvir-sofosbuvir yields SVR rates of 97–100% for genotypes 1 and 4, with rapid virological suppression and robust safety profile<sup>[1][2][5]</sup>.
- **Safety:** Most common adverse events are fatigue, headache, and GI symptoms (nausea, vomiting); nearly all are mild and self-limited<sup>[1][6][2]</sup>.
- **Pharmacokinetics:** Pediatric pharmacokinetic studies confirm adult-equivalent drug exposure with weight-based dosing, validating the regimen<sup>[1][2]</sup>.

**Table 2. Summary of Pediatric Cohorts (6–11 Years Old, Various Trials)**

| Study/Series                            | Age Range (years) | SVR12 (%) | Common AEs                    |
|-----------------------------------------|-------------------|-----------|-------------------------------|
| Schwarz et al. (2020) <sup>[1][5]</sup> | 6–11              | 99        | Headache, cough, fatigue      |
| Lega et al. (2021) <sup>[7]</sup>       | 7–11              | 98        | Nausea, malaise, None serious |
| PubMed, 2020 <sup>[6]</sup>             | 4–10              | 100       | Fatigue (90%), headache       |
| PubMed, 2018 <sup>[2]</sup>             | 6–11              | 99        | Headache, pyrexia             |

#### Off-Label Use Justification

- The patient fell just below the weight for adult tablet dosing but matched published pediatric protocols<sup>[2][4]</sup>.
- International guidelines and recent Indian experience endorse off-label use for children  $\geq 3$  years old using weight bands<sup>[3][8]</sup>.
- Literature consensus: Even in special populations (e.g., with comorbidities), SVR12 rates remain high ( $>95\%$ )<sup>[7][9]</sup>.

#### Graph: SVR12 Rates in Pediatric HCV (6–11 Years), Ledipasvir-Sofosbuvir

| Study                | No. of Patients | SVR12 Achieved (%) |
|----------------------|-----------------|--------------------|
| Schwarz et al., 2020 | 34              | 97                 |

|                   |    |     |
|-------------------|----|-----|
| PubMed, 2018      | 92 | 99  |
| Lega et al., 2021 | 29 | 98  |
| PubMed, 2020      | 30 | 100 |

### Clinical Pearls

- **Treatment of chronic HCV in children  $\geq 6$  years is highly successful with DAAs, even in off-label settings, under specialist supervision.**
- Solid data support use for genotypes 1 and 4; real-world experience continues to expand usage safely and effectively<sup>[11][7][6]</sup>.
- Transparent communication with caregivers and thorough safety/efficacy monitoring are mandatory.
- Mild, transient symptoms are the predominant adverse events and rarely require any intervention.

### CONCLUSION

This case illustrates that ledipasvir-sofosbuvir can be safely and effectively used off-label in a 10-year-old pediatric patient for chronic HCV genotype 4 infection, achieving SVR12 without significant adverse events. The experience aligns with emerging pediatric trial data endorsing high efficacy and tolerability in children under 12 years. This case advocates for flexible, evidence-informed decision-making in pediatric antiviral therapy when faced with limited alternative options.

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