Successful treatment of hepatitis C in young child on hemodialysis

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BACKGROUND: Direct-acting Antivirals (DAAs) dramatically improve the treatment of hepatitis C virus (HCV) infections; however, the treatment of HCV in young children with chronic kidney disease is controversial because of possible adverse effects.

Case summary: We report a case of sustained remission of a 9-year-old Egyptian girl with end stage kidney disease on regular dialysis as having chronic hepatitis C, genotype 1a. She was treated with Paritaprevir/ritonavir/ombitasvir and dasabuvir for 12 weeks.

Conclusion: Our case showed a high safety margin, efficacy and tolerability in Hemodialysis-dependent patient under the age of 12. Confirmation of these clinical observations in large clinical studies may help improve morbidity and decrease mortality outcome in pediatric with chronic kidney disease.

Key Words: HCV; Hemodialysis; DAAs

CASE REPORT

Globally, 130–150 million people have chronic hepatitis C virus (HCV) infection, 11 million of infected people are younger than 15 years of age, of whom 5 million are viraemic (1). After the universal screening of blood products, the leading source of infection in childhood is mother-to-child transmission in developed countries, and horizontal transmission in low-income and middle-income countries (2). While the prevalence of HCV in Qatar is 0.40.8%, reaching up to 8.7% in dialysis patients (3), little data are known about HCV infection in children, especially in KD subgroup. In the last 4 years, interferon-free direct-acting antiviral therapies have been approved, and several combinations have been studied in dialysis patients. The highest rate of eradication of HCV infection in patients with end-stage renal (ESRD) was reported with the second generation directly-acting antivirals (DAAs). Those patients were previously considered “difficult to treat”. In a recent report, the combination of Paritaprevir/Ritonavir/Ombitasvir (Viekirax), which is eliminated through the biliary system, shows higher rate of efficacy and safety in patients with chronic kidney disease (CKD) stage 4 or 5, whether cirrhotic or non-cirrhotic (4). Paritaprevir inhibits the HCV NS3/4A protease and ombitasvir is an inhibitor of NSSA, both working to prevent viral replication. Although HCV remains an important consideration in pediatric ESRD, and HCV infection may affect the renal replacement plan and outcome, the current guidelines do not apply directly and completely to this specific agegroup population. The United States Food and Drug Administration (FDA) recently approved sofosbuvir and the fixed-dose combination of ledipasvir/sofosbuvir for the treatment of hepatitis C virus infection in children ages 12 to 17 (5). Also, high rate of cure with high safety was reported in children with hepatitis C, aged from 6 to 11 years, who were treated with a halfstrength tablet of sofosbuvir/ledipasvir. Up-to-date, no satisfactory data are published on the use of Viekirax in pediatrics with severely decreased kidney function. We report the case of the youngest hemodialysis girl with chronic HCV infection on the new medication.

CASE SUMMARY

A 9-year-old Egyptian girl with ESRD secondary to focal segmental glomerulonephritis (FSGS) and steroid resistant Nephrotic syndrome (SRNS). The diagnosis of nephrotic syndrome was in March, 2016 was not responding to end-stage renal (ESRD) was reported with the second generation directly and completely to this specific age-group population. The United States Food and Drug Administration (FDA) recently approved sofosbuvir and the fixed-dose combination of ledipasvir/sofosbuvir for the treatment of hepatitis C virus infection in children ages 12 to 17 (5). Whether cirrhotic or non-cirrhotic (4). Paritaprevir inhibits the HCV NS3/4A protease and ombitasvir is an inhibitor of NSSA, both working to prevent viral replication. Although HCV remains an important consideration in pediatric ESRD, and HCV infection may affect the renal replacement plan and outcome, the current guidelines do not apply directly and completely to this specific agegroup population. The United States Food and Drug Administration (FDA) recently approved sofosbuvir and the fixed-dose combination of ledipasvir/sofosbuvir for the treatment of hepatitis C virus infection in children ages 12 to 17 (5). Also, high rate of cure with high safety was reported in children with hepatitis C, aged from 6 to 11 years, who were treated with a halfstrength tablet of sofosbuvir/ledipasvir. Up-to-date, no satisfactory data are published on the use of Viekirax in pediatrics with severely decreased kidney function. We report the case of the youngest hemodialysis girl with chronic HCV infection on the new medication.

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estimated that 13.2 (11.5–21.2) million children aged between 1 and 15 years are HCV infected worldwide (6), and the prevalence was higher among children with renal failure requiring hemodialysis and those treated for malignancy (7). It was reported that the prevalence of HCV is as high up to 18% in children with CKD have hepatitis C infection in Egypt and this may increase the duration of renal disease, the more likely to be positive for HCV (8). Also, HCV causes adverse effects leading to the poor long-term outcome in renal transplant recipients. HCV infection increases the risk of renal impairment with higher risk of morbidity and mortality and, on the other hand, renal impairment, especially stage 4-5 CKD, increases the incidence of HCV. This reciprocal negative influence emphasizes the need for priority access to oral antiviral drugs in these patients. Every HCV-infected patient waiting for kidney transplantation should be considered for antiviral therapy to reduce HCV-associated posttransplant morbidity and mortality. The EMA and the FDA, approved two DAA combinations for treatment of children with chronic HCV infection, ledipasvir/sofosbuvir and sofosbuvir and ribavirin, and studies have shown that SVR24 corresponds to a definitive cure of HCV infection in 98% to 100% of cases (9). Viekirax was reported to be safely and effectively used in adult patients with HCV infection and end stage chronic kidney disease (10), even those with factors predicting an unfavorable response to treatment, such as compromised cirrhosis or advanced fibrosis and nonresponse to previous treatment with PegIFN plus ribavirin (11). The Hepatology Committee of European Society of Pediatric Gastroenterology, Hepatology and Nutrition 2018 (12), recommended that treatment of children under 12 should be individualized, based on the severity of liver disease and the presence of co-morbid disease. Accordingly, we treated our patient with viekirax, so she can proceed for kidney transplantation. Similar to, preliminary results of 100% cure rate in children aged 6 to 11 years, who was treated with the fixed-dose combination of ledipasvir/sofosbuvir, our 9 years patient showed complete sustained viral eradication (13). We used a full dose of Viekirax/Exivira, which is not adjusted to the body size which, Where the Pharmacokinetics studies in Patients with Chronic HCV Infection, reported that, no dose adjustments are needed for the 3D regimen in patients with mild or moderate renal impairment (14). In accordance to Aby et al. (15), In spite of viral clearance, there was no significant differences in renal function decline or clinical improvement, suggests that viral eradication may not be associated with improvement in the progression of renal disease. This can be simply explained that, HCV infection causes membranoproliferative glomerulonephritis (MPGN) in the setting of cryoglobulinemia, which is not the cause in our patient with FSGS. The exact mechanism of HCV-induced kidney injury could be attributed to Immune complex deposition with HCV proteins and anti-HCV antibodies in the mesangium which associated higher proteinuria or HCV induces accelerated atheromatous disease at the kidney level. The effect of viral clearance on kidney disease progression is conflicting. While, a recent study by Emery et al. (16), showed that despite high SVR rates after DAA treatment in patients with HCV associated mixed cryoglobulinemia only 29.4% of symptomatic patients had complete cryoprecipitate clearance, our patient showed decrease in protein excretion. This similar to a meta-analysis, which showed that at least 75% exclusion with interferon-based therapy was not associated with a decrease in serum creatinine, however, those who achieved SVR12 did have a decrease in protein excretion (15), +l but, it may be simply explained by the decline in urine output over a period of dialysis. The most common reported adverse events associated with Paritaprevir/ritonavir/ombitasvir with dasabuvir therapy included nausea, pruritus, insomnia, diarrhea, asthenia, dry skin, vomiting, and anemia, but our patient did not experience any of them (17). Although, the main concern for DAAs therapy, remains drug-drug interactions, but in our case, no drug interaction noticed. Hematologic adverse events, which were frequently observed among patients with CKD, were not seen in our case.

CONCLUSION

Our case report demonstrates that treatment with Paritaprevir/ritonavir/ombitasvir (Viekirax), shows the high safety margin, efficacy and tolerability in the kidney- dependent patient under the age of 12. With implications of effective HCV-DAAs therapies in children, it may be prudent to institute strategies to decrease waiting time and waitlist mortality for HCV+ candidates by using DAA, which approved in adults, for children on waiting list, with close monitoring. Further studies are needed to increase the body of evidence related to use of the Viekirax with younger children on hemodialysis.

SUPPORT

This case has been treated in HMC and all investigations and medication were part of the routine work.

CONFLICT OF INTEREST

I declare that the authors have no competing interests or other interests that might be perceived to influence the results and/or discussion reported in this paper.

REFERENCES