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COMMENTARY

Hepatitis C virus (HCV) in dialysis units: where are we now?

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Hemodialysis patients are a high-risk group for infection by the hepatitis C virus (HCV). This was obvious within a few months of the discovery of HCV. Hundreds of studies have been published on this topic. The recent meta-analysis by Greeviroj et al. about HCV prevalence, associated risk factors and mortality in hemodialysis (HD) patients [1] is thus welcome. The authors are to be commended for this huge work: the meta-analysis covers 30 years of publications. This is a definite strength but unfortunately a limitation too. Indeed, as acknowledged by the authors, during this period there have been major changes in the epidemiology of HCV in HD, not fully apparent in the Abstract and Tables of their paper.

Table 1 reports a pooled prevalence of HCV in HD of 20.1% in Europe and 16.5% in North America [1]. In contrast, in the most recent (2012–2015) Dialysis Outcomes and Practice Patterns Study (DOPPS) phase, the prevalence is much lower, varying from 4.1% (Belgium) to 12.1% (Italy) in Europe, being 6.9% in the USA and 4.2% in Canada [2]. This striking improvement is certainly multifactorial: better hygienic precautions [2], reduction in blood transfusions with the availability of erythropoiesis-stimulating agents, and lastly a dramatic improvement in the testing of blood donors [3]. Over the last decade, the residual risk of post-transfusional HCV is considered to be < 1 case per million transfusions in most high income countries [3]. Thus, in a HD patient with a recent seroconversion for HCV, the seroconversion is much more likely to be due to the nosocomial risk of thrice-weekly HD sessions than to transfusions. Multiple lines of evidence support that some nosocomial transmission of HCV is ongoing in HD units, even in high-income countries. The incidence and prevalence of HCV are tightly correlated in HD units in the DOPPS, and new HCV cases are clustered in a minority of HD centers [2].

The authors identified dialyzer reuse as a risk factor for HCV prevalence in HD. This finding should be interpreted with some caution as it is based on only 4 studies. In addition, the outcome of interest is HCV prevalence, rather than HCV incidence that would be expected to be much more sensitive to recent events, and less prone to bias by other confounders and a cohort effect. The Kidney Disease: Improving Global Outcomes (KDIGO) guidelines do authorize dialyzer reuse, if unavoidable, provided that hygienic precautions are observed [4].

The correlation detected by the meta-analysis between young age and HCV prevalence is likely related to transmission by intravenous (IV) drug use, more prevalent in the younger age groups. The role of IV drug use in HCV transmission is further supported by the higher prevalence of HBV and HIV infection in HCV + HD patients [5].

The observation that a longer HD vintage is a risk factor for HCV prevalence in HD has been made repeatedly, especially in older studies. However, it should be noted that in the most recent DOPPS results, largely obtained prior to the widespread use of Direct-Acting Antiviral (DAA) regimens, prevalence at HD start is 4.8%, thus substantial as well. The more the incidence of HCV on HD decreases (it was more than halved between the early new millennium and 2012–2015), the more the group of patients starting HD with HCV will be a key target if HCV is to be eliminated from HD units.

Lastly, Greeviroj et al. conclude that HCV positivity is strongly associated with mortality and hospitalization in HD patients. This confirms the results of a previous meta-analysis [6]. As HCV can now be cured relatively easily, this is the right time to rid HD units of HCV. An 8- to 12-week course of a DAA regimen is very effective and well tolerated [4], and will contribute to a further reduction of both the number of infected patients and thus the virological source of nosocomial transmission within HD units. A recent report from Taiwan illustrates that HCV can almost be eliminated

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from HD units [7] by DAA regimens. This does of course not mean that hygienic precautions should be reduced [8], but eventually the frequency of screening for HCV in HD patients, currently recommended twice a year by KDIGO [4], could be reduced in units having won the battle against HCV.

Admittedly, a course of DAAs is expensive. However, one should not forget that a DAA almost consistently leads to HCV cure [9], unlike the suppression of HIV or HBV replication obtained with specific antivirals, with these viruses requiring lifelong (even more costly) therapy. In addition, some lower income countries have recently succeeded in obtaining affordable DAAs. Indeed, Egypt, admittedly the country with the highest HCV prevalence in the world, currently pays less than 100 USD for a full DAA course [11]. In Georgia, another high prevalence country, treatment with DAAs has been shown to be cost-effective [12]. Lastly, the most recent listing of WHO essential medicines includes several DAA regimens [13]. There are thus reasons to be reasonably optimistic for the availability of DAAs globally, although this will require discussion at the country level.

In conclusion, the pooled prevalence calculated by the authors largely overestimates the current prevalence of HCV in HD. Blood transfusions given over the last 2 decades in high income countries can hardly be considered a risk factor for acquiring HCV in HD. The ongoing nosocomial transmission and substantial positivity for HCV at HD start are the remaining challenges to be faced if the WHO 2030 targets to eliminate viral hepatitis as a public health problem are to be met in HD units. The excellent tolerance of current DAA regimens [9] should make the elimination of HCV from HD units both a priority and a target within reach [10].

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Data availability This commentary is not based on any original data.

Declarations

Conflict of interest Michel Jadoul declares being the co-chair of the HCV in CKD KDIGO workgroup, and the co-chair of KDIGO. The other authors have nothing to declare.

Ethical statement This commentary is based on published literature and does not need an ethical approval.

References

1. Greeviroj P, Lertussavavivat T, Thongsricome T, Takkavatakarn K, Phannajit J, Avihingsanon Y, Praditpornsilpa K, Eiam-Ong S, Susantiaphong P (2022) The world prevalence, associated risk factors and mortality of hepatitis C virus infection in hemodialysis patients: a meta-analysis. J Nephrol 35:2269–2282. https://doi.org/10.1007/s40620-022-01483-x
2. Jadoul M (1996) Transmission routes of HCV infection in dialysis. Nephrol Dial Transplant 11(suppl 4):36–38. https://doi.org/10.1093/ndt/11.supp4.36
3. Busch P, Kleinman SH (2009) Hepatitis C infection: recent insights relevant to transfusion safety. ISBT Sci Ser 4:72–79. https://doi.org/10.1111/j.1751-2824.2009.01214.x. (**Accessed December 13th, 2022**)
4. Jadoul M, Awan AA, Berenguer MC, Bruchfeld A, Fabrizi F, Goldberg DS, Jia J, Kamar N, Mohamed RJ, Pessoa MG, Pol S, Sise ME, Martin P (2022) KDIGO 2022 clinical practice guideline for the prevention, diagnosis, evaluation, and treatment of hepatitis C in chronic kidney disease. Kidney Int 102:S129–S205. https://doi.org/10.1016/j.kint.2022.07.013
5. Jadoul M, Bieber BA, Martin P, Akiba T, Nwankwo C, Arduino JM, Goodkin DA, Pisoni RL (2019) Prevalence, incidence, and risk factors for hepatitis C virus infection in hemodialysis patients. Kidney Int 95:939–947. https://doi.org/10.1016/j.kint.2018.11.038
6. Fabrizi F, Dixit V, Messa P (2019) Hepatitis C virus and mortality among patients on dialysis: A systematic review and meta-analysis. Clin Res Hepatol Gastroenterol 43(3):244–254. https://doi.org/10.1016/j.clinre.2018.10.009. (**Epub 2019 Mar 2**)
7. Tsung-Hui H, Wei-Wen S, Chi-Chieh Y, Chih-Chao Y, W-Hsien K, Yang-Yuan C, Yung-Hsiang Y, Shiou-Shiang C, Yu-Yu T, Kwei-Ming C, Sheng-Lei Y, Jun-Hung L, Chih-Da Y, Cherng-Harng L, Hsiao HJ, Yen-Po Y, Sam Li-Sheng C, Hsiu-Hsi C, Shih-Chung C, Changhua Hepatitis C, Force ET (2021) Elimination of hepatitis C virus in a dialysis population: a collaborative care model in Taiwan. Am J Kidney Dis 78:511–519. https://doi.org/10.1053/j.ajkd.2021.03.017
8. Jadoul M, Labriola L, Gordon CE (2021) HCV can and should be eliminated from dialysis units. Am J Kidney Dis 78:487–488. https://doi.org/10.1053/j.ajkd.2021.06.001
9. Pol S, Parlati L, Jadoul M (2019) Hepatitis C virus and the kidney. Nat Rev Nephrol 15:73–86. https://doi.org/10.1038/s41581-018-0081-8