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Direct-Acting Antiviral Agents are Urgently Needed in China

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Hepatitis C virus (HCV) infection is one of the most common hepatic diseases, which could pose a public health threat to the world. In China, there are more than ten million patients infected by HCV [1]. The treatment system for HCV infection has changed drastically over the past 5 years, direct-acting antiviral agents (DAAs) has stepped onto the historical stage and experienced unprecedented development with a real breakthrough [2,3]. In fact, when the pegylated interferons α-ribavirin was widely used to treat HCV infection, we have already realized that there was a possibility of being cured after infected by HCV.

Although using the oral antiviral drugs has become the major treatment option in most developed countries, DAAs are not available in China. The most common treatment still based on the use of pegylated interferons α-ribavirin. However, the cure rate of this treatment could only achieve 44% to 70% [4]. The recurrence rate for genotype 1b could even reach 10%. And it also has many side effects such as the long course of treatment, parenteral administration and the complicated operation. Moreover, for many patients with nephrosis or severe cirrhosis, such interferons are not allowed to be used. These limits towards interferons greatly hindered the patient's recovery and cure. With the development of economy, many of the domestic patients try to buy the DAAs from overseas in various ways. Unfortunately, these purchasing channels could not ensure the medicine quality, which could lead to the heavy potential safety hazard.

In 2016, the European Association for the Study of the Liver (EASL) has completely entered the DAA age, and the pegylated interferons α-ribavirin scheme was no longer recommended. The United States Food and Drug Administration (FDA) has approved the following, currently commercialised DAA:Sofosbuvir (Sovaldi) [5], Simeprevir (Olysio) [6], Daclatasvir (Daklinza) [7], Sofosbuvir+ledipasvir (Harvoni) [8], Ombitasvir-Paritaprevir/Ritonavir and dasabuvir (Viekirax) [9]. In the meantime, drugs pending commercialization in the near future are combinations of various antivirals.MSD (Merck Sharp and Dohme) combo: Grazoprevir (MK-5172), 100 mg, a second generation protease inhibitor, +Elbasvir (MK-8742), 50 mg, a second generation NS5A inhibitor(10).BMS (Bristol-Myers Squibb) combo: Asunaprevir+daclatasvir+beclabuvir: a combination of daclatasvir, asunaprevir (NS3 protease inhibitor), and beclabuvir (a non-nucleoside NS5B polymerase inhibitor) with activity in genotypes 1, 2, 3, 4 and 5; and variable activity in genotype 6 [10,11]. The main inconvenience of these new drugs is their high cost. This necessitates selection and prioritization of candidate patients to receive them, via strategies established by the various national organizations, in accordance with the recommendations of scientific societies. With the DAAs appearing on the market, the anti-HCV therapy has gone into the late DAA epoch. In this epoch, how to develop workable, practical as well as economical anti-HCV therapy based on different patient's individual need has become more complicated and challengeable.

In May 8th, 2018, Shanghai, Merck has announced that its polypill Zepatier, the DAAs towards HCV was approved by China's State Food and Drug Administration in April 28th, 2018. Zepatier is mainly used to cure the adult patients with chronic hepatitis for genotype 1 and 4 [12]. Clinical results showed that Zepatier has much higher sustained viral

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response (SVR). For genotype 1, the SVR could increase from 94% to 98% after the treatment for 12 weeks. For genotype 4, the SVR could increase from 97% to 100%for 12 weeks [13]. Nowadays, 56.8% the HCV infection patients was genotype 1b in China. Zepatier would definitely bring the patients more options and more convenient conditions for curing HCV infection [14].

Zepatieris called as the "binary star" combination for curing HCV infection. It is a kind of combination drug of elbasvir and grazoprevir. The patients should take one pill every day for sustaining 12 weeks. This treatment would not need to combine ribavirin, which provides a much more convenient therapeutic schedule with only one single tablet. Meantime, for the HCV infection patients with other diseases such as cirrhosis, HIV, advanced chronic kidney disease and hereditary blood disease, Zepatier treatment could also get satisfactory efficacy when combined with other common clinical drugs.

AUTHOR'S CONTRIBUTION

All authors have contributed to this article. YQL drafted the full manuscript and XG contributed in editing the manuscript.

COMPETING FINANCIAL INTERESTS

The authors declare no competing financial interests.

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