Elimination of Hepatitis B and C in Hong Kong

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INTRODUCTION

In recognition of the growing burden of hepatitis B virus (HBV) and hepatitis C virus (HCV) infections and the advances in the prevention and treatment of chronic hepatitis, the World Health Assembly in 2016 adopted Global health sector strategy on viral hepatitis, 2016-2021, which outlined a global goal of eliminating viral hepatitis as a major public health threat by 20301. The strategy provides a set of global targets, covering both impact (incidence and mortality) and service coverage. The impact targets refer to achieving a reduction of 90% in incidence and 65% in mortality by 2030, as compared with the baseline figures in 2015. Service coverage targets cover key interventions on (i) hepatitis B vaccination, (ii) prevention of mother-to-child transmission of HBV, (iii) harm reduction, (iv) blood safety, (v) injection safety, (vi) diagnosis of viral hepatitis B and C, and (vii) treatment of viral hepatitis B and C.

The Government of Hong Kong Special Administrative Region is determined to meet the World Health Organization (WHO) targets. It announced in the 2017 Policy Address the setting up of a steering committee to formulate strategies to prevent and control viral hepatitis effectively. Co-chaired by the Director of Health and the Chief Executive of the Hospital Authority, the Steering Committee on Prevention and Control of Viral Hepatitis (SCVH) was established in July 2018. The SCVH has been tasked to review local and international trends and developments in the prevention and control of viral hepatitis; advise the Government on policies and cost-effective targeted strategies for prevention and control of viral hepatitis; as well as conduct and coordinate the surveillance and evaluation of viral hepatitis control and recommend an appropriate response.

Against this background, this article discusses viral hepatitis elimination strategies for progressing towards the 2030 WHO targets in our local context in Hong Kong. As there are considerable differences in the epidemiology and interventions, strategies for eliminating new cases and deaths attributable to HBV and HCV infections would be elaborated respectively.

OVERALL STRATEGIES

Seroprevalence of hepatitis B surface antigen (HBsAg) has been decreasing in many populations without apparent risk of infection, such as new blood donors, antenatal women and pre-marital/pre-pregnancy screening clients, suggesting a shift from a region of high-intermediate to intermediate-low hepatitis B endemicity in the past decades2. However, the age- and sex-adjusted prevalence of hepatitis B surface antigen (HBsAg) in the latest territory-wide epidemiological study remained high at 7.2%, implying that over 500,000 people were having chronic hepatitis B in Hong Kong3. The major burden of HBV infections lies in the adult population (aged 30 or above) who did not benefit from the universal neonatal hepatitis B immunisation programme which started in 1988. Given a large size of the local general population affected by hepatitis B, the strategy shall focus on enhanced prevention of mother-to-child transmission (MTCT) and expansion of services for appropriate medical management to reduce risk of chronic liver disease.

In contrast, the prevalence of chronic HCV infection was low at 0.3% in the general population in Hong Kong, but it prevails in some specific populations4. The complexity of HCV epidemiology would be best addressed by applying targeted interventions towards “micro-elimination” in the populations most affected by and at risk of hepatitis C. Micro-elimination is considered a pragmatic approach for achieving HCV elimination by breaking down national elimination goals into smaller goals for individual population segments and delivering treatment and prevention interventions using targeted methods for the sub-population segments5. Pursuing the micro-elimination of HCV means working to achieve the WHO targets in specific sub-populations.

ELIMINATION OF INCIDENT CHRONIC HBV INFECTION

The risk of chronicity following acute HBV infection can be as high as 80% - 90% in infected neonates and around 30% in infected children before six years of age, in contrast to ≤ 5% in healthy adults6. Knowingly, the incidence of chronic HBV infection in Hong Kong is largely driven by the infections acquired in infancy through perinatal or early childhood exposure to HBV. The primary intervention for preventing HBV infection is vaccination, which is able to induce protective antibody titres in more than 95% of healthy vaccines7.

In Hong Kong, universal hepatitis B immunisation for newborn infants and administration of hepatitis B immunoglobulin (HBIG) to those born to HBsAg-
positive mothers have been in place since 1988, in addition to routine HBsAg screening for pregnant women. A series of immunisation coverage surveys since 2001 showed that the coverage of the third dose of hepatitis B vaccine among children aged 3 - 5 was consistently reaching 99% or more, far above the 2030 WHO target at 90%7. With those efforts, a significant achievement in the prevention of HBV vertical transmission was made. Hong Kong was verified by Western Pacific Regional Office of the WHO as having successfully achieved the goal of HBV control in July 2011, and was also verified as of June 2013 as having met the goal of achieving a seroprevalence of less than 1%. Despite the success, there is a residual risk of HBV transmission to the newborns. A recent local study found that MTCT has continued to occur at a rate of 1.1% (7 out of 641) and babies born to women with high viral load were particularly vulnerable8.

Greater efforts should be made to further prevent MTCT given the advent of potent antiviral drugs in pregnancy category B. In fact, antiviral treatment is recommended for women with HBV DNA levels exceeding 200,000 IU per millilitre in the latest international guidelines9,10. An initiative of providing HBsAg-positive mothers with high viral load with a treatment option to use tenofovir has been implemented in Hong Kong in a phased approach. The pilot phase commenced in two hospitals at the beginning of 2020, before rolling out in all birthing hospitals in Hospital Authority (HA).

In addition, WHO Western Pacific Region emphasises that post-vaccination serologic testing (PVST) of infants born to HBsAg-positive mothers is important to determine the effectiveness of prevention of MTCT of HBV when antenatal HBV screening is in place11. The PVST shall consist of tests for both HBsAg and hepatitis B surface antibody (anti-HBs) and the result can identify infants who do not have an adequate immune response to an initial hepatitis B vaccine series as well as those infected with HBV. From experience in some provinces in China, PVST programme was demonstrated to be feasible and considered an essential strategy to ensure full protection for vaccine non-responders and appropriate medical care for those infected12. Notably, various barriers, such as lost to follow up, parents’ refusal to venous blood draws and highly skilled procedure for paediatric blood sampling, have to be tackled for successful implementation of PVST13.

ELIMINATION OF HBV-RELATED DEATHS

Testing and treatment are the primary means of reducing HBV-related deaths for the WHO 2030 targets. In spite of widely available and accessible serological and molecular tests for hepatitis B and effective antiviral treatments, the diagnosis and treatment coverage rate in Hong Kong were still far below the WHO 2030 targets at 90% and 80% respectively. Nearly 50% of the HBsAg-positive participants in a population-based study in 2015-16 were not aware of their infection status7. A modelling study gave a much lower diagnosis rate for HBV infection at 27% in 2016, while an estimated 22% of those eligible for HBV treatment were being treated14.

The complexities and healthcare resources required for maintaining HBV treatment for a huge number of cases in Hong Kong pose a major challenge in improving the coverage of diagnosis and treatment. Although the incidence of cirrhosis, hepatocellular carcinoma (HCC) and even death can be effectively reduced with antiviral treatments, the infection can rarely be cured, and most cases would require lifelong treatment once initiated. Regular assessments of the liver function, testing for various HBV biomarkers and surveillance for HCC are also recommended for those on antiviral treatment. Understandably, there would be substantial resource implications on drug, laboratory capacity, clinical equipment and workforce, calling for the development of alternative service model and stepwise capacity building for hepatitis B medical care.

ELIMINATION OF INCIDENT HCV INFECTION

As percutaneous exposure to contaminated blood is the primary cause of most HCV infection, protection of injection and blood safety are key interventions in the healthcare setting. In Hong Kong, there are guidelines and training on standard infection control practices to prevent blood-borne infections in the healthcare setting. Standard management regarding the most important blood-borne infections, including HCV, is also in place. The facility-level injection safety is protected by the standard practice of using single-use of disposable injection equipment for all therapeutic injections in healthcare facilities.

The transmission of HCV to hemodialysis patients has declined over the years due to better screening of blood products, improved dialysis procedures, and less need for blood transfusion with the availability of erythropoiesis-stimulating agents. Still, HCV prevalence remains far higher in people receiving hemodialysis than in the general population. In the HA, the prevalence of HCV infection in hemodialysis patients is around 1 - 2%. Therefore, there is an ongoing plan to treat all HCV infection of patients with end-stage renal failure undergoing dialysis (both haemodialysis and peritoneal dialysis) in the HA, irrespective of their liver fibrosis stage or candidacy for a kidney transplant.

Similar to the situation in other high-income regions of the world, injecting drug use is the major source of incidental HCV infection in the community. Recent studies gave a high prevalence of anti-HCV in people who inject drugs (PWID) and ex-PWID at 76.4% and 73.4% respectively15,16. A Cochrane review and meta-analysis found that a lower risk of hepatitis C acquisition was associated with opioid substitution therapy (OST), which could further be strengthened with safer injection practices17. It is anticipated that the methadone treatment programme, as an OST for harm reduction in Hong Kong since the 1970s, would play a role in the elimination of HCV infections among PWID. The importance of coordinated, multi-disciplinary care teams in increasing linkage of HCV care and uptake of treatment in PWID can never be overemphasised. The plan is to start engaging different stakeholders and conducting needs assessments to design the focus of effort.
In the past decade, sexually transmitted HCV infections among men who have sex with men (MSM), especially those who were HIV-positive, was increasingly reported worldwide and in Hong Kong. As a well-defined population in linkage to healthcare, people living with HIV are suitable for HCV micro-elimination. Empirical studies showed that scale-up of HCV testing and treatment would be followed by a decrease in the incidence of HCV infections in this key population, signifying the effect of "treatment as prevention".

ELIMINATION OF HCV-RELATED DEATHS

The mortality reduction target is now justified with the excellent diagnostic and therapeutic interventions for HCV infection. Direct-acting antiviral (DAA) treatment regimens for 8-12 weeks are effective for all HCV genotypes, with a cure rate generally exceeding 90%. In Hong Kong, the estimated diagnosis and treatment rates were just 50.9% and 12.4% respectively, while interferon-based regimens were the first-line therapy and DAA reimbursement was restricted to patients with advanced liver diseases only. Clearly, a generalised use of DAA in HCV treatment is needed for achieving a larger reduction in the disease burden. Since 2019, the HA has started to further extend the use of DAA to milder stages of the disease with a view to cover more patients who are clinically eligible for treatment until HCV is eliminated.

Removing fibrosis restrictions makes it possible to treat more people, but even countries with unrestricted access to DAAs have reported a decline in treatment rates after an initial expansion. To eliminate HCV, it will be essential to find people living with HCV, many of whom have been disenfranchised from the healthcare system, and engage them in care that is adapted to their needs.

HONG KONG VIRAL HEPATITIS ACTION PLAN

Noting all these opportunities and challenges in the elimination of HBV and HCV, the SCVH has been working with different stakeholders to develop an Action Plan for Hong Kong. The Action Plan will set out the direction and strategies to work towards the WHO goals, thereby realising the vision "Hong Kong will be a place where new viral hepatitis infections have ceased, and where everyone with chronic viral hepatitis has access to effective and affordable care and treatment."

References
