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An Investigation of Hepatitis B Infection in China

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Abstract: *The most serious kind of viral hepatitis is hepatitis B virus (HBV). In China, there are 87 million persons who are chronic HBV carriers. People who have been infected with HBV for a long period are more likely to develop HBV-related liver diseases. In this paper, we examine differences in two variables (hepatitis B antibody rate and screening rate) between countries, taking into account social factors and prevailing transmission factors, and propose governance recommendations that are consistent with China's national situation. We draw on the public health governance of relevant countries and refer to WHO governance strategies. First, regulate the primary transmission channels, interrupt mother-to-child transmission, then apply viral interruption in newborns in less developed areas, to create a demographic faultage of the virus. Second, to limit transmission rates and preserve liver health, combine medical resources and encourage people to take free immunizations and antiviral therapy.*

Keywords: *Adult; Hepatitis B; China*

1. Introduction

The hepatitis B virus (HBV) is the most dangerous type of viral hepatitis, causing a potentially fatal liver infection as well as chronic liver disease and cancer (Ott, Stevens and Wiersma, 2012)[1]. China's overall number of infections is expected to outnumber any European country's entire population. (Andr é, 2000)[2]. In detail, there are 87 million people who are chronic carriers of the HBV in China, accounting for about one-third of all HBV chronic carriers in the world (Hepatitis, 2021)[3]. People who have been infected with HBV for a long time are at a higher risk of acquiring HBV-related liver illnesses such as cirrhosis and hepatocellular carcinoma (Chang and Liaw, 2014)[4]. As CDC 2020 Yellow Book (*figure1*) showed, Hyperendemic areas are defined as regions where the hepatitis B surface antigen (HBsAg) is positive in more than 8% of the population;higher intermediate prevalence is referred to as areas where the HBsAg is positive in 5–7.99 percent of the population, China belongs to this range now.

MAP 4-4. **Prevalence of hepatitis B virus infection**[1]
Boundary representation is not necessarily authoritative.
[1] Disease data source: Schweitzer A, Horn J, Mikolajczyk R, Krause G, Ott J. Estimations of worldwide prevalence of chronic hepatitis B virus infection: a systematic review of data published between 1965 and 2013. www.thelancet.com. 2015.Vol 386.

(Picture from:(CDC,2O15).Disease data source: Schweitzer et al, 2015)[5]

Figure 1: Prevalence of hepatitis B virus infection in 2015

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2. Direction of governance

HBV can also be transmitted through close personal contact with an infected person on a regular and long-term basis. Transmission from a chronically infected woman to her infant after birth is one of the most common routes of HBV infection in China (Peng, 2020)[6].

Hepatitis B virus prevalence is more hidden among pregnant women in rural areas, where medical testing is less developed than in urban areas. Therefore, relevant investigation and research are more meaningful and authentic. Xin's (2016)[7] investigation found that HBV serological markers were absent in 50.38% of people from rural regions, indicating that they were vulnerable to HBV infection. HBV vaccination rates in children have reached over 90% (CDC, 2007), however rates in women of reproductive age from rural regions remain low. Hu's (2012)[8] finding also confirmed that the screening rate of HBs-Ag among pregnant women in rural areas was lower than that of urban women, only 46.9%, but the screening rate of urban women was also lower than developed country. It is undeniable that higher rates of hepatitis B carriage in women tend to increase the rate of hepatitis B carriage in the next generation of children, thus creating a new wave of hepatitis B outbreaks. The direction of governance in China therefore requires the use of virus-blocking technologies, i.e. vaccines, to isolate cross-generational transmission of the virus.

On the other hand, the systematic data analysis by Huai (2019) showed that 90% of recent HBV infections in China are adults over the age of 20. According to the *figure2*, Wang et al (2019)[9] data study also confirms this phenomenon, implying that the majority of these folks haven't been vaccinated against HBV and are unimmune to it. Such approaches, have covered nearly 30 years of data in China, elucidating that limited antibody levels and detection rates, as well as a lack of early vaccination lead to Chinese adults group and the newborns are at increased risk of HBV infection. The next step in China's governance direction is the large, high-risk adult population.

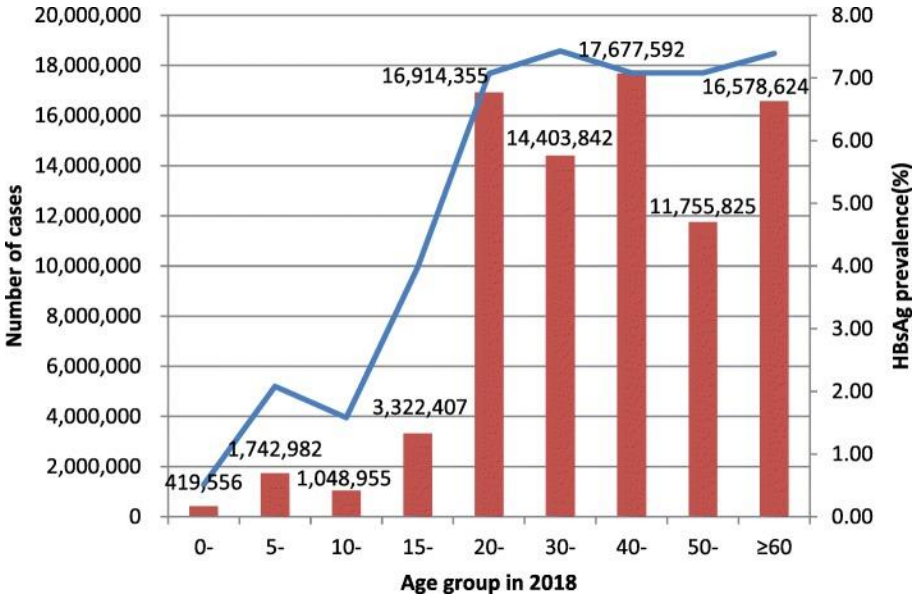

Figure 2: Estimated HBsAg morbidity and the number of people with HBVin the general population of China according to age in 2018(Wang et al.,2019)

3. Policy Recommendations

Policy 1: Ensure that every infant born to a hepatitis B-positive pregnant woman receives a virus-blocking treatment.

The WHO in South Asia implemented hepatitis B vaccine intervention in many countries, such as Thailand and Bangladesh, which successfully reduced the number of chronic infections by 30%. Since the analysis model did not consider herd immunity or delayed immunization, which would lead to data delay. In fact, subsequent data also showed that introduction to the vaccine is effective against reducing HBsAg prevalence (Childs, Roesel and Tohme, 2018)[10]. The intervention program refers to a birth dose of hepatitis B vaccination followed by two to three further doses, chronic HBV infection is usually prevented. Similarly, Shepard's research approved that in newborns' virus-blocking therapy has

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been demonstrated to be 95% effective in avoiding acute and chronic HBV infection.

(Source from Shepard,CW.etal,2006)[11]

Figure 3: Prevalence of hepatitis Bvirus infection in 2002

Compared with the prevalence of degree in 2015, the prevalence of HBsAg in 2002 among population aged under 60 was 9.75%, indicating a high HBV prevalence region (Pic2), it was estimated that 120 million people were infected with HBsAg, and nearly 300,000 people died each year as a result of the long-term effects of HBV infection. (Xia et al., 1996)[12]. Moreover, researchers discovered that rural Chinese women had a high probability of carrying HBV and a poor diagnosis rate. What's worse, Willis (2010)[13] further found that some maternity hospitals in China were unavailable for hepatitis B immune globulin and virus-blocking was neglected by obstetricians, resulting in the propagation of HBV has been dominated by mother-to-child transmission.

In view of good examples and necessity, Chinese government began to adopt the Hepatitis B immunization program since 2002 (Cui et al., 2013)[14]. The prevalence of HBsAg in population aged below 60 decreased to 7.18%, which meant that HBV vaccination of newborns protected an estimated 16–20 million HBV carriers against infection. (Liang, X. et al., 2009)[15]. Although these infant-prevention efforts in China have shown to be effective, some maternity hospitals still lack artificial immune mechanisms, infants must be vaccinated at designated infectious disease vaccination sites. which allows time for viral replication. As a result, regulations should require that all obstetrics and gynaecology departments be equipped with artificial immune mechanisms, despite a more complicated and costly screening procedure for pregnant women.

Policy 2: Strengthen the entire adult vaccination process and make antiviral treatment available

The challenge of expanding hepatitis B diagnostic coverage is not the only barrier for this policy; it is also the simplicity with which patients may receive testing and treatment, as well as the capacity of national health care financing to further lower the cost of long-term hepatitis B medication (Liu *et al.*, 2019)[16]. For instance, despite the government's introduction of the corresponding vaccine policy in 1992, the adult population who wanted to be vaccinated still needs to pay, especially when patients are advised that they require long-term or lifetime antiviral therapy, they are typically reluctant and mentally burdened by the high expense of treatment, low compliance is detrimental to liver treatment and these negative feelings per se are harmful to the liver organ as well (Chida, Sudo and Kubo, 2006)[17], and the population's health awareness was poor at the moment, resulting in a high prevalence of HBV among adults, particularly the middle-aged population adults.

To solve these, government health department should make full use of adult liver health fund. Adults with negative hepatitis B antibodies must receive free hepatitis B vaccines, and HBV carriers will receive free antiviral treatment to ensure that their virus load and infectiousness are lowered. Although providing free medical service will increase the government's financial burden, when compared to long-term or even lifelong antiviral therapy, national health authorities should vigorously promote it.

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4. Conclusion

Over the past three decades, China has made good progress in the prevention and treatment of hepatitis B, but China remains in the higher intermediate prevalence zone. Using excellent examples from successful WHO pilot countries, this paper compares disparities in hepatitis B screening rates and hepatitis B antibody coverage among women in developed countries and China, as well as the findings that hepatitis B carriage rates among adults and minors in China are currently stratified. On the one hand, it is suggested that the present focus of treatment should be on preventing hepatitis B in babies in remote locations, and on the other, minimising the distance between hepatitis B vaccinations, hepatitis B medications, and health facilities for the general public.

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