

## Ministry of Health in Iran Is Serious about Controlling Hepatitis B

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**H**epatitis B is one of the most common infectious diseases globally. It has been estimated that there are 350-400 million chronic hepatitis B virus (HBV) carriers worldwide, of whom 75% are Asians. About one-quarter of these will eventually die from the consequences of this chronic infection. Iran is located in the Middle East and has an intermediate prevalence of hepatitis B chronic infection, according to CDC. The prevalence of chronic carrier state in Iran had been reported to be 3% in 1980s <sup>(1)</sup>. It is estimated that over 35% of Iranian have been exposed to the HBV and about 3% were chronic carriers<sup>(1)</sup>, ranging from 1.7% in Fars province to over 5% in Sistan-Baluchestan<sup>(2)</sup>. In 1979, the prevalence of hepatitis B surface antigen in Iran ranged between 2.5% and 7.2% <sup>(1)</sup>. It decreased to 1.7% in blood donors in 1987. In general population, this prevalence was 1.7% and 2.49% <sup>(3)</sup> in 1992 and 1993, respectively. Another study showed that HBV prevalence is 1.07% in blood donors in Shiraz in 2000 <sup>(4)</sup>. HBV prevalence has decreased dramatically in Iranian population during the last decade. Improvement of the people's knowledge about HBV risk factors, national vaccination program since 1993 for all neonates, vaccination of high risk groups such as healthcare workers and the introduction of disposable syringes for use in vaccinations, hospitals and clinics might justify this decrease. Sexual transmission is the most important mode of spread of HBV in most developed countries. Fifty-one to 56% of Iranian cirrhotic patients were hepatitis B surface antigen (HBsAg) positive<sup>(5, 6)</sup>. In a study performed on 250,000 healthy volunteer blood donors in Tehran, 3.6% of male and 1.6% of female donors were HBsAg carriers <sup>(7)</sup>. The most common

cause of acute viral hepatitis in adulthood, chronic hepatitis, cirrhosis, hepatocellular carcinoma and acute liver failure is hepatitis B <sup>(2, 5, 6)</sup>. In Iran, several studies have been performed to determine the prevalence of hepatitis B carrier state. The prevalence rate of HBsAg positivity is low now, with HBsAg carrier rate of less than 2% <sup>(8)</sup>. The neonatal vaccination program launched in 1992 was not expected to change these figures for the general population before the year 2002. A recent study showed that the rate of hepatitis B carriers varied between zero and 3.9% with an average of 1.7% <sup>(9)</sup>. In this study, 3.6% of the population was HBsAg positive, putting Khorassan among the highly affected areas of Iran.

The overall seropositivity rate showed no significant decline between 1991 and 1999 but in the age group 2-14 years, the rates reduced significantly (1.3% versus 0.8%, P<0.05). Interestingly, we observed a significantly higher decline in hepatitis B virus carrier rate in rural (1.5% versus 0.6%) than in urban areas (1.1% versus 0.9%). Universal vaccination significantly decreased the carrier rate among young children in this country <sup>(9)</sup>. Universal vaccination of all neonates against hepatitis B virus has been implemented in the Islamic Republic of Iran since 1993 (Ministry of Health report). The impact of vaccination programs had been illustrated by 1999 and 1991 studies. The prevalence of HBsAg in children has decreased from 1.3 to 0.9% within 6 years of starting a Expanded Program on Immunization (EPI)<sup>(9)</sup>. Similarities to it have been reported from other countries such as Saudi Arabia and Taiwan. In Iran, the vaccination against hepatitis B was done in 2 provinces in 1989

(Zanjan, Semnan), and in 1993 the vaccination was included in the extended program of immunization (EPI) countrywide with the aim of eradication of the infection. It was recommended to be done in all infants, and high risk groups. After 13 years of implementation, the coverage has reached an appropriate level from 62% in 1993 to 94% in 2005.

Evaluation of risk factors in HBV infected people is important for designing the strategies to control the disease. In a study in blood donors of Tehran (all blood donors of Tehran city from April 1997 to March 2000 were studied in a case control design), the most common risk factors were family history of positive HBsAg, history of blood transfusion, male gender, history of hospitalization, history of unsafe sex and living in city area. There was a significant difference between cases and controls regarding HBsAg status in donors' mother and spouse (10). Another study in blood donors in Ghazvin revealed that close contact with an HBV infected person, extramarital sexual contact, history of sexually transmitted diseases and high risk jobs were independent risk factors for prediction of hepatitis B infection. Horizontal mode is more important than vertical transmission in this region of Iran (11). In Karaj, the risk factors in chronic hepatitis B were older age, male gender, marital status, history of contact with hepatitis, extramarital sexual activity, IV-drug use, major surgery, experimental dentist visit, and some jobs (police, barber, and driver) (12). In a Cohort study (Nov 2001-Dec 2003) with historical controls, the prevalence of HBV infection increased after 16 years old (13).

### Prospect for future

The age at which HBV infection occurs influences the long-term outcome and determines the primary targets of a vaccination program. Thus, perinatal transmission from mother to child at or soon after birth results in about 90% chronic carriage, with its long-term complications of chronic hepatitis, cirrhosis and hepatocellular carcinoma, leading to death in middle age, particularly in men. This has serious economic consequences for the family and for the country as a whole (14). The contribution of each mode of transmission to morbidity and mortality must be known in order to develop the optimal vaccination program. Those countries that vaccinate only children will produce an impact in early life, but it will not be until those vaccinated children reach adolescence or early adult life that any impact on sexual transmission will be seen. Thus, if sexual transmission is the main mode

in a country, adolescents would have to be vaccinated to have an immediate impact on acute cases of hepatitis B and on the development of chronic carriage in this age group. Another important consideration before starting any intervention is the baseline disease situation.

Fortunately in Iran, there is a good healthcare infrastructure for vaccination program. The long-term objective of a hepatitis B vaccination program is to prevent virus transmission in all age groups (newborns, children, adolescents, and at-risk adults), with the ultimate aim of eliminating the infection, even in long-term, of eradicating the virus. This is likely to prove much more difficult than the eradication of smallpox and polio, because of the pool of chronic carriers. The short and medium term goals are to prevent chronic and acute symptomatic infection and to reduce healthcare costs. The long-term goals are to prevent the chronic complication, i.e. cirrhosis and hepatocellular carcinoma.

The Center for Disease Control (CDC) has recommended universal vaccination for high risk adolescents and all newborns; furthermore, recently in a cost-effectiveness analysis, vaccination for schoolchildren at the age of 10 was recommended, as the risk of exposure becomes higher as these children enter the high risk teenage and young adult years. WHO recommended all countries that have reached the satisfactory coverage level of hepatitis B immunization through routine vaccination, to deal with other groups at risk (these groups may be infected through other routes). According to published data, the prevalence of HBsAg positivity increases with age. The epidemiology of infection is also changing from vertical to horizontal route. In 2002, regarding the country's health needs and priorities, in order to extend the target groups for hepatitis B vaccination, the program was revised by the "National Committee of Hepatitis". That committee recommended also vaccinating people with high risk occupations like firefighters, workers of city hall, etc. Ministry of Health and Medical Education (MOHME) did a rapid survey and it was concluded that 12% of the first target group were already vaccinated against HBV. MOHME and undersecretary of Health Affairs, and CDC have been supported directly by His Excellency Minister of Health, Professor Lankarani to start this campaign. Ministry of Health and Medical Education in Iran held the mass campaign of immunization against hepatitis B for those born from 1989 to March 2007. During this campaign 1,320,000 people were vaccinated and about 90% coverage was reached. Hepatitis B vaccination takes

years if not decades to show effectiveness in the community. We, epidemiologists, gastroenterologists, infectious disease specialists and health care staff are responsible to capture this unique opportunity to elucidate the epidemiology of hepatitis B in Islamic Republic of Iran. Fortunately, the health infrastructure to expand the coverage for more vaccination is accessible in Iran.

I believe that this approach will decrease the incidence rate in Iranian population, especially if followed by these considerations:

- educating the people, especially at risk group
- implementing strategies to prevent the transmission to others
- screening and finding the patients in early stages and asymptomatic phase

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