BIRDEM Med J 2026; 16(1): 1-2
DOI: https://doi.org/10.3329/birdem.v16i1.87558

Screening for hepatitis B virus infection

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Hepatitis B virus (HBV) being a global health issue affecting approximately 364 million world population with an overall yearly mortality around one million, primarily from cirrhosis and liver cancer mostly in countries with high prevalence in Asia (2-6.89%) and Africa (8-19%) having relatively low financial and infrastructural background.[1,2]

As the pathophysiology of this viral infection is well understood, its incidence and prevalence are amenable to reduce to a reasonably tolerable level through vaccination to newborns within 24 hours and to at-risk individuals plus practicing safe sex, avoiding sharing needles/personal items (razors, toothbrushes), ensuring sterile equipment for tattoos/piercings and practicing universal precautions in healthcare settings to block contact with infected blood or body fluids.

Being exposed to HBV by any mean, an individual is to pass through a number of virological and clinical stages, based on which, follow up and treatment are scheduled. Treatment, so far available for this infection is to keep the virus under control in non-replicating form. Fortunately, the vaccine developed through recombinant DNA technology, against this infection is highly effective to prevent getting this infection.

Although, the effects of screening versus on clinical outcomes have not specifically evaluated, screening can lead to vaccination and counseling of high-risk uninfected individuals, as well as linkage to appropriate medical care and treatment for those who have chronic infection or are at risk for reactivation of resolved infection .[3,4] Recommended tests for screening for HBV are to check for **HBsAg** (hepatitis B surface antigen), **anti-HBc or HBcAb total** (hepatitis B core antibody) and **anti-HBs or HBsAb** (hepatitis B surface antibody).[5]

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The test for hepatitis B surface antigen detects the presence of HBV. A positive result means the person is currently infected and can pass the infection to others. If positivity persists for more than 6 months, the infection is considered chronic.

The test for hepatitis B core antibody detects the presence of the core protein of the virus (by antibody). A positive result means the person has been infected with or vaccinated against HBV but it does not specify whether the person has cleared the virus, still has the infection, or is immune to reinfection. A negative result means the person has never been infected with HBV.

The test for hepatitis B surface antibody detects the presence of antibody against surface protein (or the surface antigen) of the virus that appears after clearance of the virus (or successfully vaccinated). People who have surface antibodies have lifetime protection from future HBV infection. In people who do not clear the virus but develop chronic infection, these antibodies never appear.

Screening is recommended for:

- All adults at least once (many guidelines now support universal adult screening)
- Pregnant women (every pregnancy)
- People born in or with parents from high-prevalence regions (Asia, Africa, Pacific Islands, parts of Eastern Europe)
- Household or sexual contacts of someone with HBV
- People with HIV, HCV, or other STIs
- Injection drug users
- Patients on hemodialysis or immunosuppressive therapy
- Healthcare and public safety workers at risk of blood exposure

Interpretation of common results

HBsAg	Anti-HBs	Anti-HBc	Interpretation
“	“	“	Susceptible → vaccinate
“	+	“	Immune (vaccinated)
“	+	+	Immune (past infection)
+	“	+	Current infection
“	“	+	Possible resolved infection / occult HBV (needs follow up)

Use of results of screening

- Negative & not immune→Vaccinate
- Positive HBsAg→Further evaluation (HBV DNA, ALT, HBeAg) and monitoring or treatment
- Pregnant + HBsAg positive→Newborn needs HBIG + vaccine at birth

So, screening for hepatitis B not only will provide a comprehensive data regarding the magnitude of the problem in a community or a country but will also unveil a spectrum of clinical conditions that merits specific intervention for that stage. Among them, birth day vaccination of the infant (both active and passive) especially to HBsAg positive mother can play an important role in eradication or substantial reduction of this infection.

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