

## Shanvac™-B

Hepatitis-B Vaccine IP (r-DNA)

### QUALITATIVE AND QUANTITATIVE COMPOSITION:

**Shanvac™-B**, hepatitis-B vaccine is a sterile suspension containing purified major surface antigen of the hepatitis B virus manufactured by recombinant DNA technology. The antigen is produced by culture of genetically engineered cells of *Pichia pastoris*, methylotropic yeast, which carry the gene that codes for the major surface antigen of the hepatitis B virus (HBV). The surface antigen expressed in *Pichia pastoris* cells is purified by several physiochemical steps and formulated as a suspension of the antigen adsorbed on aluminium hydroxide gel. The vaccine does not contain any material of human or animal origin.

Each ml of vaccine contains 20mcg of Hepatitis-B surface antigen (purified), 0.5 mg of aluminium hydroxide gel, and 0.05 mg of Thiomersal as preservative.

### THERAPEUTIC INDICATIONS

Hepatitis B vaccine is indicated for immunization against infection caused by hepatitis B virus.

#### Routine vaccination

- All infants, children, and adolescents.<sup>1</sup>

#### High-risk populations

- Health care personnel in direct contact with patients (Physicians, surgeons, dentists, nurses, first aid, ambulance and cleaning personnel, etc.).
- Students in medical, dental and nursing schools in contact with patients.
- People who work with blood or blood products.
- A Thalassaemic/Haemophilic/Other patient who receives blood transfusion.
- Haemodialysis and organ transplant recipients.<sup>2</sup>
- Military personnel on active duty.
- Prisoners, prison guards and other prison employees.
- Persons living in institutions and community homes and the staff of these institutions.
- Household contacts and sexual partners of infected persons.<sup>1</sup>
- Newborn children of infected mothers.
- Persons at increased risk of disease due to their sexual practices such as promiscuous persons, male homosexuals, prostitutes and venereal disease patients.<sup>1</sup>
- Injectable drug abusers.<sup>1</sup>
- Travellers going to and coming from high-risk countries or regions.<sup>1</sup>

### DOSAGE AND ADMINISTRATION

- For neonates, and children the recommended dosage of **Shanvac™-B** is 10mcg of antigen protein in 0.5ml suspension.
- For adolescent below the age of 19 years **Shanvac™-B** can be used at a dose of 10mcg of antigen protein in 0.5ml suspension.
- For adult over the age of 19 years, the recommended dosage of **Shanvac™-B** is 20mcg of antigen protein in 1ml suspension.

**Shanvac™-B** should be injected intramuscularly.

IT SHOULD NOT BE GIVEN INTRAVENOUSLY.

In neonates and infants **Shanvac™-B** should be given in the anterolateral thigh. In adults the injection should be given in the deltoid region. The

vaccine may be administered subcutaneously in patients with severe bleeding tendencies (e.g. hemophiliacs). **Shanvac™-B** should not be given in the gluteal region, as the immune response may be lower.

#### Immunization Regimen

Protective antibody titre level is 10mIU/ml. Primary immunization consists of three intramuscular doses of hepatitis B vaccine following either Schedule A or Schedule B. Schedule A is recommended for those who come under high-risk category. Schedule B is recommended for routine immunization.

#### Schedule A

1 <sup>st</sup> dose	At an elected date
2 <sup>nd</sup> dose	1 month after the 1 <sup>st</sup> dose
3 <sup>rd</sup> dose	2 months after the 1 <sup>st</sup> dose
A booster dose is recommended 12 months after the 1 <sup>st</sup> dose.	
A second booster dose may be required after 8 years if the titre falls below 10mIU/ml.	

#### Schedule B

1 <sup>st</sup> dose	At an elected date
2 <sup>nd</sup> dose	1 month after the 1 <sup>st</sup> dose
3 <sup>rd</sup> dose	6 months after the 1 <sup>st</sup> dose
A booster dose may be required after 8-10 years if the titre falls below 10mIU/ml.	

#### Immunization in special situations

- Neonates Born to HBV Carriers Mothers**

First dose of hepatitis B vaccine can be administered simultaneously with hepatitis B immunoglobulin, which must be given at a separate injection site. The immunization should start immediately after birth and preferably use 0,1 and 2 months schedule.

- Known/Presumed Exposure to HBV**

First dose of hepatitis B vaccine can be administered simultaneously with hepatitis B immunoglobulin, which however must be given at a separate injection site.

- Chronic Haemodialysis Patients<sup>2</sup>**

The recommended dosage of hepatitis B vaccine is 40 mcg (2 ml) using a 0, 1, 2, 6 months vaccination schedule. Anti-HBs surveillance every 3-6 months is warranted so as to maintain the accepted protective levels of 10mIU/ml.

### CONTRA-INDICATIONS

**Shanvac™-B** should not be administered to

- Subjects who are hypersensitive to any component of the vaccine or to subjects who have shown signs of hypersensitivity after previous **Shanvac™-B** vaccination.
- Subjects with severe febrile infections.

### PRECAUTIONS

- As with any injectable vaccine, epinephrine should be available for use in case of anaphylaxis or anaphylactic reaction.
- The vaccine should be well shaken before use.
- In presence of minor infection **Shanvac™-B** to be used only when clearly needed, and the possible advantage outweighs the possible risks.

### WARNING

- Immune response is generally weaker for the people over 40 years of age, obese individuals, subjects with immuno-deficiency or those receiving immuno-suppressive therapy. Thus adequate anti-HBs antibody titres may not be obtained after primary immunisation course. In such subjects/patient's additional doses of vaccine may be required.

- The vaccine does not prevent infection by hepatitis A, hepatitis C, hepatitis D, hepatitis E or other pathogens known to infect the liver.

- Pregnancy and Lactation

**Pregnancy:** Adequate human and animal data on use during pregnancy is not available. Hepatitis B vaccine should be used during pregnancy only when clearly needed, and the possible advantage outweighs the possible risks to the fetus.

**Lactation:** Adequate human and animal data on use during lactation is not available. Caution should be exercised when hepatitis B vaccine is administered to lactating women.

- If the individual is already a carrier of hepatitis B virus with or without disease he may not respond to vaccine. However the vaccine has not been shown to have any deleterious effects.

### INTERACTIONS WITH OTHER VACCINES

- Hepatitis B vaccine can be co-administered with DPT, DT and/or OPV.
- Hepatitis B vaccine can be co-administered together with measles mumps-rubella vaccines, Haemophilus influenzae b vaccine, hepatitis A vaccine and BCG.

Different injectables should be administered at different sites using separate needles and syringes.

#### Interchangeability with Other Hepatitis B Vaccines

**Shanvac™-B** can be used, for primary vaccination as well as for booster doses interchangeably with plasma derived or other rDNA based hepatitis B vaccines.

### ADVERSE REACTIONS

#### Common:

**Injection site:** Mild soreness, indurations, erythema.

#### Rare:

**Systemic:** Fatigue, low-grade fever and malaise.

**Skin and appendages:** Rash, pruritus, urticaria.

**Musculoskeletal system:** Arthralgia, myalgia.

**Digestive system:** Nausea, vomiting, diarrhoea, and abdominal pain.

**Hepatobiliary system:** Abnormal liver function tests.

**Nervous system:** Dizziness and paresthesia.

#### Extremely rare:

**Systemic:** Anaphylaxis, serum sickness, angioedema and erythema multiforme.

**Musculoskeletal system:** Arthritis.

**CVS:** Syncope, Hypotension.

**Nervous system:** Neuropathy, neuritis (including Guillain-Barre' syndrome, optic neuritis), encephalitis, and meningitis.

**Respiratory system:** Bronchoconstriction like symptoms.

**Lymphoid system:** Lymphadenopathy.

### PHARMACOLOGICAL PROPERTIES

#### Pharmacodynamic properties

**Shanvac™-B** generates specific protective immune response against HBsAg.

For protection against HBV infection the anti-HBsAg titre (Anti HBs antibodies) should be above 10 mIU/ml.

#### Immunogenicity and Safety of Shanvac™-B

##### I. Infants & Children

In six controlled studies conducted in infants and children using 0,1,2 months and 0,1,6 months vaccination schedule **Shanvac™-B** has shown 100 % seroprotection after 3<sup>rd</sup> dose with GMT ranging from 643 mIU/ml to 2643 mIU/ml and 17611 mIU/ml to 19183 mIU/ml respectively.<sup>3,4,5,6</sup>

##### II. Healthy Adults

In eight controlled studies **Shanvac™-B** has shown seroconversion in 96.4 % to 100 % subjects with a GMT ranging from 419mIU/ml to 24338mIU/ml after 3<sup>rd</sup> dose of vaccination.<sup>7,8,9</sup>

### III. Studies In High Risk Groups

Study in patients with chronic renal failure **Shanvac™-B** showed seroprotection in 80% of patients with a GMT of 218mIU/ml after 3<sup>rd</sup> dose of 0,1,2 schedule.<sup>2</sup>

**Shanvac™-B** showed 100% seroprotection in a study of haemophilic patients, with the GMT of 2767mIU/ml. after third dose of 0,1,6 schedule.<sup>6</sup>

### IV. Long Term Efficacy

Even four years after vaccination with **Shanvac™-B** 100% of subjects were seroprotected. The GMT after four years was 306mIU/ml and 832mIU/ml after last dose of 0,1,6 and 0,1,2,12 schedule respectively.<sup>6</sup>

### PHARMACEUTICAL DETAILS

#### Preparation for Administration:

- **Shanvac™-B** is presented as a ready to use suspension.
- The vaccine should be shaken well to obtain a homogenous turbid white suspension.
- The vaccine should be inspected visually for particulate material or discolouration prior to administration.
- Sterile needle and syringe should be used for withdrawal of vaccine.
- Aseptic techniques should be followed.

#### Form

**Shanvac™-B** is presented as a sterile ready to use suspension for intra-muscular administration.

#### Shelf Life:

36 months from the date of manufacture.

#### Special Precautions for Storage:

Protect from light. **DO NOT FREEZE**. Discard vial if contents are frozen.

**Store and transport the vaccine at +2° C to +8° C.**

#### Presentation:

**Shanvac™-B** is marketed as:

- 0.5ml and 1ml Single dose Vial.
- 2.0ml Vial for use in Immuno-Compromised Patients.
- 2.5ml, 3.0ml, 5.0ml and 10.0ml Multi-dose Vials.

### LEGAL CATEGORY

Schedule H

### REFERENCES

1. ACIP. *MMWR* 1999;48(02):33-34.
2. *Indian J Nephrol* 1998;8:141.
3. *Indian Pediatrics* 2000;37:75-80.
4. *Indian Pediatrics* 1999;36:581-583.
5. *Indian Journal of Gastroenterology* 1999;18:S24-S25.
6. DATA ON FILE: Shantha Biotechnics Pvt. Ltd
7. *Vaccine* 1999;17:1125-1129.
8. *JAPI* 1998;46:620-622.
9. *Indian Journal of Gastroenterology* 2000;19:71-73.

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