



HBsAg Screening Using Immunochromatography Method in Preoperative Patients at Dr. Soegiri Hospital, Lamongan

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Abstract

Patients undergoing surgery require HBsAg screening to determine their hepatitis B infection status. Hepatitis B remains a global health concern with a relatively high incidence rate, including in Indonesia. This study aimed to describe the results of HBsAg screening using the immunochromatographic method among preoperative patients at Dr. Soegiri Lamongan Hospital. This study employed a descriptive design with a cross-sectional approach. The research sample consisted of 100 preoperative patients selected using purposive sampling. HBsAg detection was performed using an immunochromatographic rapid test method. Data were analyzed using frequency distribution. The results showed that most preoperative patients had negative HBsAg results, with 92 samples (92%), while positive results were identified in 8 samples (8%), consisting of 4 male and 4 female patients aged 46–60 years. Based on these findings, it was concluded that the majority of preoperative patients tested negative for HBsAg, while positive HBsAg results were detected in a small proportion of samples.

INTRODUCTION

Preoperative examinations are essential steps in preventing the transmission of infectious diseases. Patients undergoing surgery require HBsAg screening (Hepatitis B surface antigen) to determine their hepatitis B infection status. The examination results are important for both patients and healthcare workers. Surgical procedures require optimal implementation of universal precautions to minimize infection risks (Balgahoom et al., 2024). Preoperative screening can help identify asymptomatic carriers of hepatitis B virus (HBV) and reduce the risk of transmission in healthcare settings, including nosocomial transmission (George et al., 2025).

Hepatitis B is an infection of the liver caused by the hepatitis B virus (HBV). The disease can develop into acute or chronic infection and may lead to liver inflammation, cirrhosis, hepatocellular carcinoma, and death. Hepatitis B is characterized by an inflammatory process in liver tissue and is commonly associated with liver disease or jaundice (Firdayanti et al., 2024). According to the World Health Organization (WHO) (2024), approximately 254 million people worldwide were living with hepatitis B, with 2.2 million new infections reported in 2022. In the same year, approximately 1.3 million deaths occurred, with a substantial proportion among individuals aged 30–54 years. Of the reported cases, 58% occurred among men and 12% among women.

Needle stick injuries (NSIs) are significant occupational hazards in healthcare facilities due to exposure to blood that may contain infectious pathogens. These injuries commonly occur because of improper needle recapping, inadequate disposal of sharp instruments, and fatigue associated with high workloads. Globally, more than 2 million healthcare workers are exposed

to NSIs annually, and studies indicate that 30–60% of laboratory and clinical workers have experienced at least one NSI during their careers. The high proportion of unreported NSI cases, which reaches approximately 70%, complicates risk assessment and safety evaluation in healthcare facilities. Healthcare workers may be exposed to blood-borne pathogens, particularly HBV, which has a transmission risk of approximately 6–30%. Workers in blood-exposure-prone units, such as emergency departments, laboratories, and operating rooms, have a higher incidence of NSIs than those in other units. Fatigue and poor adherence to safety procedures further increase NSI risks, making HBV exposure a significant occupational threat for healthcare workers (Jan and Benazir, 2025; Nadan et al., 2025).

In Indonesia, hepatitis B infection remains a disease with a significant prevalence. In 2022, Indonesia ranked third globally, with an estimated 17.5 million infected individuals (6.2%). China ranked first with approximately 79.7 million cases (27.5%), followed by India with approximately 29.8 million cases (11.6%) (World Health Organization, 2024). In 2023, the prevalence of hepatitis B among all age groups in Indonesia reached 877,531 cases (0.12%). Among pregnant women participating in Early Detection of Hepatitis B (DDHB), 3,358,549 individuals (68.4%) were screened, with 50,789 women (1.5%) testing positive for HBsAg (Ministry of Health BKPK, 2023; Ministry of Health of the Republic of Indonesia, 2023).

According to the Ministry of Health of the Republic of Indonesia (2023), the prevalence of hepatitis B among pregnant women undergoing DDHB in East Java reached 83.4%, with 1.6% testing positive for HBsAg. The detection rate of hepatitis B-positive pregnant women decreased from 1.79% in 2021 to 1.64% in 2023. In 2024, DDHB coverage among pregnant women reached 72.79%, with 1.6% testing positive for HBsAg. Lamongan Regency ranked sixth, with the prevalence of HBsAg-positive pregnant women reaching 2.31%. Although these data represent pregnant women, they indicate that HBV exposure remains present among East Java residents, particularly in Lamongan Regency. Therefore, HBsAg testing remains important among other risk groups, especially patients undergoing surgery in hospitals (Ministry of Health of the Republic of Indonesia, 2023, 2024).

Several factors contribute to hepatitis B infection, including vertical transmission. In chronic hepatitis B infection, older individuals may experience reduced immune responses and may become asymptomatic carriers of HBsAg. Gender differences may also influence hepatitis B progression. The predisposition to chronic disease progression is associated with biological and hormonal factors. HBV-related complications and severe liver outcomes tend to be more common among men than women (Parmono et al., 2024). Surgical indications among preoperative patients include various health conditions requiring surgical intervention, whether elective or emergency. Each procedure carries different risks related to blood exposure depending on the type and duration of surgery. These differences highlight the importance of preoperative HBsAg screening for early detection of infection (Malik et al., 2020).

Hepatitis B transmission occurs through vertical transmission (from mother to child) and horizontal transmission (between individuals). Horizontal transmission may occur through contact with infected body fluids, including blood and other biological fluids (Ministry of Health, 2023). Transmission may also occur through blood transfusions, contaminated needles, sexual contact, and the use of medical or personal equipment contaminated with HBV (Angeli et al., 2024).

HBsAg examination is necessary to confirm the presence of HBV infection. One method used for qualitative immunoserological detection of HBsAg is the immunochromatographic method. This method can detect antigens with adequate accuracy and is considered efficient for large-scale screening activities (Angeli et al., 2024). However, the effectiveness of this method requires further evaluation, particularly among high-risk populations (Ansar et al., 2025).

A study by George et al. (2025) involving 11,131 preoperative patients reported that 231 patients (2.07%) tested positive for HBsAg, while 10,900 patients (98%) tested negative. Among the 231 HBsAg-seropositive patients, 170 (73.6%) were male and 61 (26.4%) were female. Therefore, this study was conducted to examine HBsAg screening using the immunochromatographic method among preoperative patients at Dr. Soegiri Lamongan Hospital, a type B hospital, to determine the distribution of HBsAg examination results and support universal precautions in the operating room.

The research question was: What is the description of HBsAg screening results using the immunochromatographic method among preoperative patients at Dr. Soegiri Lamongan Hospital?

The limitations of this study were as follows: (1) the samples were obtained from inpatients who underwent HBsAg screening and surgical procedures at Dr. Soegiri Lamongan Hospital; and (2) HBsAg examination was performed using the immunochromatographic method.

The aim of this study was to determine the incidence of hepatitis B infection among preoperative patients at Dr. Soegiri Lamongan Hospital.

The specific objectives of this study were: (1) to perform HBsAg screening using the immunochromatographic method among preoperative patients at Dr. Soegiri Lamongan Hospital; and (2) to analyze the distribution of HBsAg screening results among preoperative patients at Dr. Soegiri Lamongan Hospital.

METHOD

Design

This study uses a descriptive design with an approach *Cross-sectional*, with the aim of determining the incidence of hepatitis B infection in preoperative patients at Dr. Soegiri Lamongan Hospital.

Location and Time

Location

This research was conducted in the laboratory of Dr. Soegiri Lamongan Hospital located on Jl. Kusuma Bangsa No.7, Lamongan, East Java.

Time

The planning and implementation of the research began in October 2025 to May 2026.

Operational Variables and Definitions

Operational Variables

Independent Variables

The independent variable of this study was preoperative patients at Dr. Soegiri Lamongan Hospital.

Bound Variables

The binding variable of this study is the results of *Hepatitis B Surface Antigen* (HBsAg) screening.

Operational Definition

- 1) Preoperative patients are patients who received surgery at Dr. Soegiri Lamongan Hospital during the research period. Data were obtained from medical records and direct examinations conducted by researchers on preoperative patients who had screened HBsAg using the immunochromatography method.
- 2) HBsAg is the result of HBsAg screening obtained from preoperative patients who have been measured using *the HBsAg* Rapid test measuring tool with the immunochromatography method, and the scale used is nominal.

Design Sample

Research Population

This study involved preoperative patients undergoing HBsAg screening at Dr. Soegiri Lamongan Hospital in the January-December 2025 period for secondary data and February-March 2026 for primary data.

Research Sample

The number of samples to be used in this study uses a formula from *Lemeshow*, because the population is unknown or infinite. The following is the formula of the *Lemeshow*, namely:

$$n = \frac{z^2 \cdot P (1 - P)}{d^2}$$

Description :

n = number of samples

z = z score at 95% confidence = 1.96

P = maximum estimate = 0.5

d = alpha (0.10) or *sampling error* = 10%

Through the formula above, the number of samples to be used is:

$$\begin{aligned} n &= \frac{z^2 \cdot P (1 - P)}{d^2} \\ n &= \frac{1.96^2 \cdot 0.5 (1 - 0.5)}{0.10^2} \\ n &= \frac{1.9208 \cdot 0.5}{0.01} \\ n &= 96.04 = 100 \end{aligned}$$

If based on this formula, then the n obtained is 96 samples which are rounded by the researcher into 100 samples. So in this study, data was taken from at least 100 samples.

The sampling techniques used are *purposive sampling*, which is a sampling method that relies on the assessment of the researcher according to predetermined criteria (Firmansyah and Dede, 2022).

Sample Criteria

The sample of this study is part of the population that has met the inclusion and exclusion criteria.

A. Inclusion Criteria

- 1) Pre-operative patients who will carry out surgery at Dr. Soegiri Lamongan Hospital.

2) Preoperative patients who were screened for HBsAg.

B. Exclusion Criteria

1) Pre-operative patients who did not carry out surgery at Dr. Soegiri Lamongan Hospital.

2) Preoperative patients who were not screened for HBsAg.

Research Flow

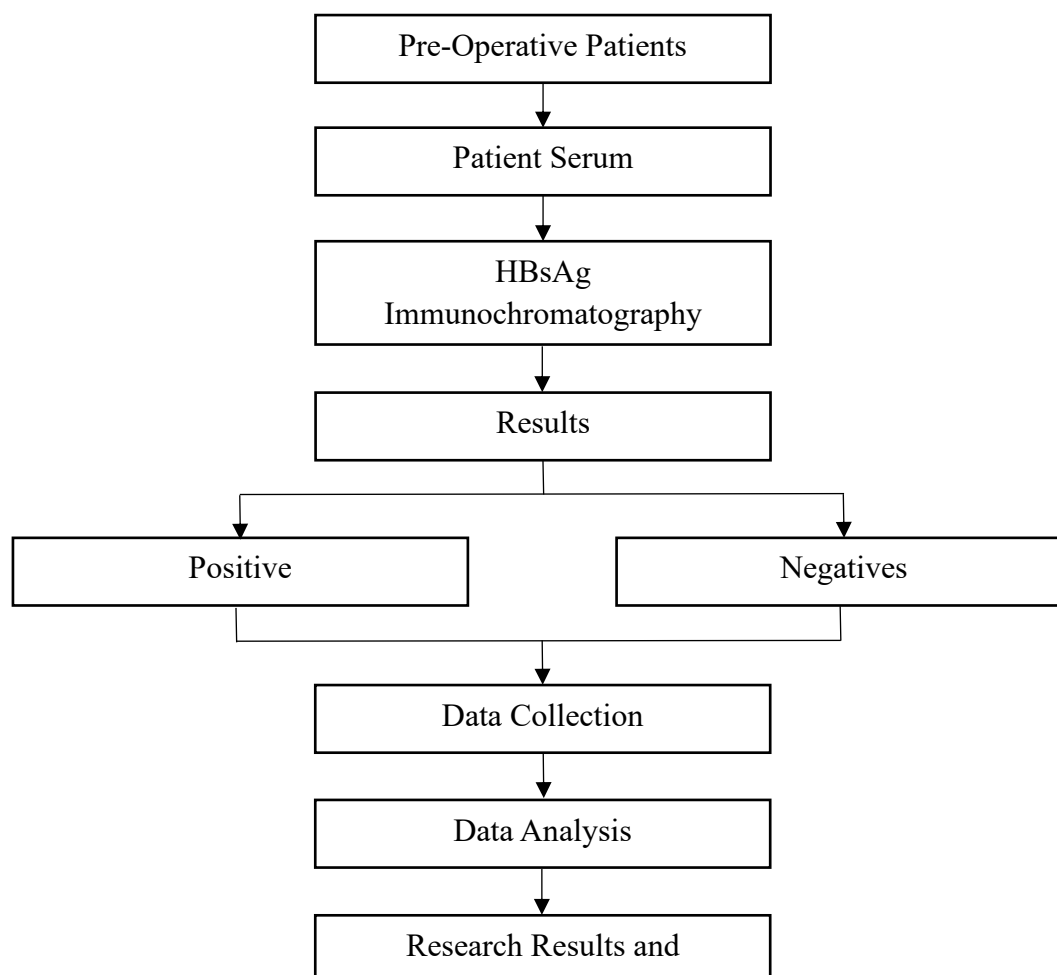


Figure 1. Research Flow

RESULTS AND DISCUSSION

Research Results

The results of the study in the form of a percentage of HBsAg examinations that have been carried out on preoperative patients at Dr. Soegiri Lamongan Hospital can be seen in the table below.

Table 1. Frequency Distribution of HBsAg in Preoperative Patients

Results	Frequency (n)	Percentage (%)
Positive	8	8%
Negatives	92	92%
Total	100	100%

Based on table 1 of the distribution of HBsAg frequencies in preoperative patients at Dr. Soegiri Lamongan Hospital, the results of 100 samples were obtained as many as 8 samples (8%) positive for HBsAg and 92 samples (92%) negative for HBsAg.

Table 2. Frequency Distribution of HBsAg in Preoperative Patients
By Age

Patient Age	HBsAg Examination				Quantity	
	Positive		Negatives			
	n	%	n	%	n	%
0-15 Years	0	0%	12	12%	12	12%
16-30 Years	0	0%	19	19%	19	19%
31-45 Years	3	3%	22	22%	25	25%
46-60 Years	4	4%	25	25%	29	29%
61-75 Years	1	1%	14	14%	15	15%
Total	8	8%	92	92%	100	100%

From table 2 of the frequency distribution based on the age of preoperative patients, it can be seen that in the age interval of 0-15 years as many as 12 samples (12%) and 16-30 years as many as 19 samples (19%) were not found positive results for HBsAg. In the age interval of 31-45 years with a total sample of 25 samples (25%), there were 3 samples (3%) positive for HBsAg and 22 samples (22%) negative for HBsAg. In the age interval of 46-60 years, out of 29 samples (29%) there were 4 samples (4%) positive for HBsAg and 25 samples (25%) negative for HBsAg. And of the 15 samples in the age range of 61-75 years, there was 1 sample (1%) tested positive for HBsAg and 14 samples (14%) were negative for HBsAg.

Table 3. Frequency Distribution of HBsAg in Preoperative Patients
By Gender

Gender	HBsAg Examination				Quantity	
	Positive		Negatives			
	n	%	n	%	n	%
Female (P)	4	4%	50	50%	54	54%
Male (L)	4	4%	42	42%	46	46%
Total	8	8%	92	92%	100	100%

Of the 3 frequency distribution by sex, out of 54 samples (54%) in female patients, 4 samples (4%) were HBsAg positive and 50 samples (50%) were HBsAg negative. Then, of the 46 samples (46%) in male patients, there were 4 samples (4%) positive for HBsAg and 42 samples (42%) negative for HBsAg.

Table 4. Frequency Distribution of HBsAg in Preoperative Patients
Based on Operating Indications

Operation Indications	HBsAg Examination				Quantity	
	Positive		Negatives			
	n	%	n	%	n	%
Infectious/Inflammatory	1	1%	20	20%	21	21%
Neoplastic/Tumor/Cystic	2	2%	22	22%	24	24%
Orthopedic/Musculoskeletal	2	2%	22	22%	24	24%
Urological/Urinary Tract	2	2%	17	17%	19	19%
Digestive Surgical	0	0%	7	7%	7	7%
Gynecological	1	1%	1	1%	2	2%
Other Disorders	0	0%	3	3%	3	3%
Total	8	8%	92	92%	100	100%

Based on table 4 of the frequency distribution based on surgery indications, the number of patient samples with the highest surgical indications in *Neoplastic/Tumor/Cystic* and *Orthopedic/Musculoskeletal*, each of 24 samples (24%) with 2 samples of positive HBsAg each and 22 negative HBsAg samples (22%). Next, there are *Urological/Urinary Tract* as many as 19 samples (19%), with positive HBsAg results of 2 samples (2%) and negative HBsAg as many as 17 samples (17%). Furthermore, *Infectious/Inflammatory* as many as 21 samples (21%), with positive HBsAg results of 1 sample (1%) and negative HBsAg of 20 samples (20%). Then, there are *Gynecological* with a total of 2 samples (2%), the results of the examination were 1 sample (1%) positive for HBsAg and 1 negative sample for HBsAg. While the indications of surgery *Digestive Surgical* 7 samples (7%), and *Other Disorders* As many as 3 samples (3%) were not found to have HBV infection, so the test results were negative for HBsAg.

Based on the results of the study on "HBsAg Screening with Immunochromatography Method in Preoperative Patients at Dr. Soegiri Lamongan Hospital" which has been carried out on 100 samples of preoperative patients at Dr. Soegiri Lamongan Hospital. This study can be found out the personal data of preoperative patients based on the medical records available at Dr. Soegiri Lamongan Hospital, such as age, gender, and surgery indications. Upon the doctor's diagnosis that indicated the patient to perform surgery, a pre-operative examination was carried out, one of which was HBsAg. The results of the HBsAg examination came from 2 different sources, namely primary data and secondary data. The data was obtained within 1 month, namely in February. This means that the research was completed sooner than previously planned in February-March. This study aims to describe the results of HBsAg examination conducted on preoperative patients at Dr. Soegiri Lamongan Hospital.

The pre-analytical stage in the HBsAg examination in preoperative patients begins with the determination of the examination request based on the diagnosis by the doctor. The sample used is in the form of the patient's venous blood collected into a 3cc vacutainer tube, then processed through *centrifuge* to obtain serum as a test material. This stage is important because

errors in the process of collecting, labeling, and storing samples can affect the validity of the test results. Next, the analytical stage or sample examination process is carried out.

At the analytical stage, HBsAg examination was performed using the immunochromatographic method (*Rapid Test*) with *Brand ViroCheck*. The principle of this examination is based on the reaction of antigens and antibodies that will produce lines on the area *Control* (C) and the *Test* (T). The test result is declared negative if only a line appears in area C, while a positive result is marked by the appearance of lines in areas C and T, and *Invalid* if there are no colored lines in 2 areas or there is only 1 colored line in area T. This method is used because it has the advantages of a simple process, short examination time, and is quite effective for the initial screening of Hepatitis B infection in preoperative patients. Then it is continued to the next stage, namely the post-analytical stage.

The post-analytical stage includes the process of reading the results, recording, and reporting the results of the audit to the DPJP. The interpreted results are then entered into the LIS system as a medical record that is used for clinical consideration before surgery is performed. If a positive result of HBsAg is found, the results are categorized as critical so that the reporting of the results of critical laboratory examinations must be submitted quickly, accurately, and on target to the DPJP so that appropriate medical actions can be carried out immediately. The JCI in the AP standard confirms the existence of a special system for reporting critical results from diagnostic examinations. This standard explains that hospitals are required to have procedures that govern the management of critical outcomes, including guidelines for health workers in requesting and receiving test results, especially in emergency situations or STAT examinations (immediate) (Iswanto *et al.*, 2021).

After the study was carried out, the results as shown in table 4.1 showed that as many as 8 samples (8%) were positive for HBsAg and 92 samples (92%) were negative for HBsAg. This is in line with research conducted by George *et al.*, (2025) that there were 231 patients (2%) tested positive for HBsAg and as many as 10,900 patients (98%) tested negative for HBsAg. According to Antique *et al.*, (2023) and Wijayadi *et al.*, (2018) patients can contract HBV through contact with blood or body fluids, invasive medical procedures, as well as exposure from the work environment. Infections are also often associated with certain medical procedures, such as surgery and tools used in medical interventions, such as catheters or breathing apparatus. Based on these results, samples that were positive for HBsAg showed the presence of HBV antigens in the blood and indicated that they had been infected with HBV, HBV was found in the blood for six weeks after infection and was no longer found after three months. A person is considered *Carrier* if the virus lasts more than six months. Meanwhile, a negative HBsAg result shows the absence of HBV antigens in the blood, meaning that the patient is in good health and not infected with HBV.

The results of the study in table 4.2 show that the frequency distribution based on the age of preoperative patients, the most HBsAg positive examination results at the age interval of 46-60 years as many as 4 samples (4%) from 29 samples (29%), followed by 31-45 years old as many as 3 samples (3%) from 25 samples (25%), and 61-75 years old 1 sample (1%) from 15 samples (15%). The results of this study are not in line with the research conducted by George *et al.*, (2025) that the majority of positive cases in the age of 21-40 years were 85 cases (37%), followed by 41-60 as many as 77 cases (33%), and >60 years old as many as 56 cases (24%). However, this research is in line with research conducted by Beautiful Hippy *et al.*,

(2022) The highest HBsAg positive cases in the age range of 45-59 years were 63 cases (1.26%). The difference in the results of this study can be influenced by population characteristics and risk factors in each research area.

According to George *et al.*, (2025) The high prevalence in the age interval of 21-40 years is due to high exposure to risk factors such as risky sexual behavior, drug use, and occupational factors that increase the likelihood of exposure to HBV infection. In addition, the lack of awareness of HBV prevention in productive age is also a supporting factor in the increase in cases in young age groups. However, in this study, the prevalence was more found at the age of 46–60 years, which is suspected to be related to long-term exposure to infection, a history of previous medical procedures, a decline in the immune system with age, and the possibility of chronic infections that have lasted for many years and were only detected during preoperative examinations. According to Wijayadi *et al.*, (2018) The prevalence of HBV tends to increase in older age due to continuous exposure to risk factors over a long period of time, such as contact with blood or body fluids, invasive medical procedures, and exposure to the work environment.

Based on the results of the study in table 4.3, it shows that the results are equivalent, namely women with positive HBsAg results as many as 4 samples (4%) from 54 samples (54%), and men with positive HBsAg results as many as 4 samples (4%) from 46 samples (46%). However, from these results, it is shown that there is a difference in the number of sexes, so it can be concluded that the male sex is more susceptible to HBsAg positive than women with a difference of 8 samples (8%). This is in accordance with research conducted by George *et al.*, (2025) showed a higher proportion of men, namely 170 patients (73.6%) and 61 female patients (26.4%).

According to Ruggieri *et al.*, (2018) and Talitha Rambe *et al.*, (2023) Men tend to have a higher risk of transmission than women because they are influenced by hormonal factors, immune system, and risky behaviors. Biologically, androgen hormones, such as testosterone in men can increase HBV replication, while estrogen hormones in women have a protective effect on liver cells and help improve the body's immune response to viral infections. In addition, women generally have a stronger innate and adaptive immune response than men, making them more effective in eliminating HBV. In addition to biological factors, lifestyle factors also affect high levels of HBsAg in men, such as smoking habits, alcohol consumption, risky sexual activities, and higher exposure to the work environment to blood or body fluids. Therefore, a combination of hormonal, immunological, and lifestyle factors causes HBsAg sufferers in men to generally be higher than women.

The results of the study from table 4.4 show that the frequency distribution is based on the indications of surgery, the number of patient samples with the most surgical indications in *Neoplastic/Tumor/Cystic* and *Orthopedic/Musculoskeletal*, each with a positive HBsAg result of 2 samples (2%) from 24 samples. Next, *Urological/Urinary Tract* there were 2 samples (2%) positive for HBsAg out of 19 samples (19%) and *Infectious/Inflammatory* with a positive HBsAg result in 1 sample (1%) from 21 samples. Then, there are *Gynecological* with the result of 1 sample (1%) positive HBsAg from 2 samples.

According to Correct *et al.*, (2020) and Malik *et al.*, (2020) Surgical indications are assessed based on the patient's condition. This is considered based on the results of the anamnesis, physical examination, and supporting examinations. Indications for surgery in

preoperative patients involve a wide range of health problems that require elective and emergency surgical procedures. Each indication of surgery has a different level of risk. These differences show the importance of screening for HBsAg as a condition of surgery to detect infection early.

Indications for operation *Neoplastic/Tumor/Cystic* requires HBsAg screening because patients with cancer or tumors often require invasive procedures, blood transfusions, and immunosuppressive therapies that can increase the risk of transmission or reactivation of HBV infection (Sundaram *et al.*, 2020). Indications for operation *Orthopedic/Musculoskeletal* is a procedure that has a high risk of blood exposure due to the use of sharp tools and invasive procedures, so HBsAg testing is needed to protect health workers and prevent nosocomial transmission during surgery (Agarwal *et al.*, 2025). Then, for the indication of operation *Urological/Urinary Tract*, which is a surgical procedure on the urinary system that often involves invasive procedures that risk exposure to blood and body fluids (Sandhu *et al.*, 2023). Then for the indication of operation *Infectious/Inflammatory* is an operation that is performed due to infection or inflammation. This condition can worsen the patient's condition and increase the risk of postoperative complications if the patient is also infected with HBV. Therefore, HBsAg screening is needed as part of preoperative evaluation to detect HBV infection early (Malik *et al.*, 2020). Furthermore, there are indications of surgery *Gynecological* that requires skiring HBsAg due to the procedure *Gynecological* often involves contact with blood and body fluids. So there is a risk of HBV transmission if the patient's infection status is unknown. In the operating group *Digestive Surgical* and *Other Disorders* no HBsAg positive results were found, but screening is still necessary because patients with a history of liver disease have a higher risk of complications if infected with HBV (Admass *et al.*, 2022; Agarwal *et al.*, 2025).

If the preoperative screening results are found to be positive, then stricter infection management and control are needed during the operation, such as the application of complete PPE, sterilization of equipment, control of NSI/blood exposure, and well-documented work procedures. The goal is to reduce the risk of biological exposure during surgery and protect healthcare workers from nosocomial infections. Surgical management in patients with positive HBsAg test results is carried out by considering the risk of transmission, as well as infection control during surgery. ATLM has an important role in handling samples and infectious waste to prevent the transmission of diseases, including HBV. In the process of handling samples, ATLM is obliged to apply the principle of *Biosafety* and GMPP by using PPE such as gloves, masks, lab coats, and face shields if there is a risk of splashes. Samples of the patient's blood or body fluids should be treated as infectious materials, stored in a sealed and labeled container *Biohazard*, and handled carefully to prevent spills, aerosols, and NSIs. In addition, the work area and examination equipment must be decontaminated after use so that cross-contamination does not occur in the laboratory (World Health Organization, 2020).

In medical waste management, ATLM is responsible for segregating waste according to categories, such as sharp waste, infectious waste, and non-medical waste. Needles, lancets, and other sharp objects should be thrown into the *Safety Box* to prevent NSI, while blood tubes, used cotton swabs, gloves, and blood-contaminated materials are put into labeled infectious waste bags *Biohazard*. Medical waste is then decontaminated, sterilized, or destroyed according to hospital procedures so that it does not become a source of infection spread or environmental pollution. WHO also emphasized that lack of compliance with SOPs, improper use of PPE, and

inadequate training can increase the risk of biological exposure in laboratory personnel (World Health Organization, 2020).

Overall, the different types of surgery indications indicate that each surgical procedure has a different level of risk of blood exposure and complications. Therefore, HBsAg screening is important in preoperative screening to detect HBV early, so that it can prevent infection transmission in hospitals, as well as assist health workers in determining safer surgical management (Malik *et al.*, 2020).

The limitation in this study is that the type of examination used is still in the form of qualitative method examinations so that the results of the examination have not provided more specific and accurate levels as in the ELISA method (Andayani *et al.*, 2023; Angela *et al.*, 2024).

CONCLUSION

Based on the results of the HBsAg screening study using the immunochromatographic method among 100 preoperative patients at Dr. Soegiri Lamongan Hospital, it can be concluded that: (1) HBsAg screening results showed that 8 samples (8%) were positive for HBsAg, while 92 samples (92%) were negative for HBsAg. (2) Positive HBsAg results among preoperative patients were most frequently identified in the 46–60-year age group, with 4 samples (4%). The number of HBsAg-positive patients was equal between women and men, with 4 samples (4%) in each group. Furthermore, positive HBsAg results were most commonly found among patients with neoplastic/tumor/cystic, orthopedic/musculoskeletal, and urological/urinary tract surgical indications, with 2 samples (2%) in each category.

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