

Seroprevalence Study of HBsAg Positive in Entrant Candidates of Medical Specialist Program at Dr. Kariadi General Hospital, Semarang

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ABSTRACT

Background: Hepatitis B Virus (HBV) infection is one of main diseases that infects human kind and constitutes a serious health problem in community. As a consequence of their job, health personnel have gained higher risk to HBV infection. Medical personnel (doctors) are determined as one of the high-risk group of the HBV infection through blood transmission. The objective of this study was to determine the prevalence of HBsAg positive in doctors who were entrant candidates of medical specialist program at Dr. Kariadi hospital.

Method: The study was conducted retrospectively by reviewing medical record of 1,145 doctors who were entrant candidates of medical specialist program at Dr. Kariadi hospital since April 2000 to October 2004. The HBsAg assay as a marker of HBV infection was analyzed by EIA (Enzyme Immuno Assay) method.

Results: Among the 1,145 doctors examined, the range of age was 29.34 ± 3.04 years, and more than 3-year work period as doctor was 64% (733/1,145), and less than 3-year work period as doctor was 36% (412/1,145). The prevalence of HBsAg positive in population was 3.9% (45/1,145). The seropositive of HBsAg in the group of doctors with more than 3-year work period was significantly higher than the group with less than 3-year work period (5.1% (38/73) vs. 1.6% (7/412) with $p < 0.05$).

Conclusion: The prevalence of HBsAg positive in doctors who were entrant candidates of specialist doctoral program at Dr. Kariadi hospital was 3.9%. The prevalence of infection was higher in the group of doctors with more than 3-year work period.

Keywords: prevalence, HBsAg, doctor

INTRODUCTION

Hepatitis B Virus (HBV) infection is one of main diseases that infects human kind and constitutes a serious health problem in community. In Asia Pacific countries such as Indonesia, the HBV infection is also apparently a major problem due to its high rate prevalence and complication.¹ It has been more than two decades that HBV infection has been recognized as one of work-related diseases to health personnel.^{2,3,4} Related factors to the high prevalence of disease are blood exposure and its products from infected patients.^{5,6}

One of the most common route of HBV transmission in health services is occurred by contaminated syringe-needle injury in health personnel with the patient's blood containing HBV (Hbs Ag (+)).⁷⁻⁸ Possible transmissions of the HBV after exposure in work would depend on concentration of infectious virus in body fluid and the volume of infectious material transmitted from the inoculation route such as percutaneous/mucosal.⁷ Several prevalence studies of the HBV infection in health personnel have been reported by local and foreign investigators.

In USA, the risk of HBV infection in health personnel population is estimated four times higher than general population. Medical personnel and dentist have been reported of getting 5-10 times more frequent HBV infection than general adult population.⁷ This study was aimed to determine the seroprevalence of hepatitis B

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surface antigen (HBsAg) and the role of work period as doctor against HBsAg exposure in medical personnel at Kariadi hospital who underwent the selection test as entrants of medical specialist program.

METHOD

A retrospective study was carried out by reviewing medical records of 1,145 doctors who underwent medical specialist program of health examination at the Dr. Kariadi hospital, Semarang since January 2000 to October 2004. The prevalence of HBsAg was determined by conducting HBsAg assay using Enzyme Linked Fluorescent Assay (ELFA) method (R/VIDAS HBsAg Ultra). Collected data included HBsAg results, sex, age, and work period as a doctor.

RESULTS

Among 1,145 medical personnel, 422 were females and 723 were males aged 25 - 35 year old, with mean of age 29.34 ± 3.04 years. The prevalence of HBsAg positive was 3.9% (45/1,145). Based on sex, there was no different HBsAg seropositivity (male on 27/723, 3.7% and female on 18/422, 4.2%, $p = 0.19$). Most of the medical personnel (64%) (733/1,145) have worked more than 3 years, and 36% (412/1,145) have worked as doctors in less than 3-year period.

The seropositivity of HBsAg in medical personnel who have worked more than 3 years as doctors was 5.1% (38/733); and for the doctors with less than 3-year work period was 1.6% (7/412) ($p = 0.003$). There was significant difference of HBsAg seropositivity between medical personnel groups who have more than 3-year work period as doctors and less than 3-year work period.

DISCUSSION

Among the 1,145 medical personnel who have undergone HBsAg test, HBsAg seropositive was resulted in 45 respondents (3.9%). This prevalence was significantly higher than general population in Semarang (2.0%) at the same period (data collected by the Indonesian Red Cross in 2000-2004). Tribowo reported a study with 2.0% prevalence of HBsAg in general population of Jogjakarta.⁹

Several studies in Western countries showed 2-10 times higher prevalence of HBsAg positive in health personnel than general population. A study by Asok Kumar et al has reported 2.6% prevalence of HBsAg positive in health personnel.⁵ In Tehran, Hamidi et al has reported the prevalence of 1.83%.¹⁰ In USA, several surveys have reported that the HBsAg (+) seroprevalence in health personnel was 3-5 times higher than general population.⁷ A study by Ciorlia et al has reported that the prevalence of HBsAg (+) in health

personnel was 0.8%, which was 4 times higher than general population, and 0.2% in blood donors.¹¹

In our study, the HBsAg seropositivity has showed no significant difference between male subjects (27/723, 3.7%) and female subjects (18/422, 4.2%) ($p = 0.19$). Different results were showed by Hovig et al in Norway and Elavia in India that demonstrated higher HBsAg seropositivity in male than female subjects.⁵ The cause of such differences was remained unknown.

There was significant difference for the prevalence of HBsAg positive between the medical personnel who have worked more than 3 years as doctor and those who have worked less than 3 year period (5.1% vs. 1.6% $p = 0.003$). Such difference may be caused by the high exposure of the HBV infection through blood, medical tools or needle stick injury occurred in the health personnel who have worked as doctors for more than 3 year period than those who have worked less than 3 years. The results of this study have demonstrated similar findings to other prevalence studies in other countries which reported that the HBV infection would increase with age and the work period as health personnel. Mean value of blood volume inoculated during the needle stick injury with no. 22 needle was about 1 μ l, a sufficient number containing 100 dose of infectious HBV.⁷

The limitation of this study is that no medical record is available about the respondent's vaccination status; therefore, a bias of vaccination influences to the risk of infection was not able to be eliminated. It is concluded that the medical personnel or doctors have high risk of being infected by HBV than the general population. The work period as doctor may affect the high frequency of getting HBV infection. Based on this study, it is indicated that prevention by hepatitis B vaccination and universal precaution policy for health personnel are highly recommended to reduce the risk of HBV infection.¹²

CONCLUSION

The prevalence of HBsAg positive in doctors who were entrant candidates of medical specialist program at Kariadi hospital was 3.9%. The prevalence of infection was higher in the group of doctors with more than 3 - year work period.

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