

# Varicella-Zoster Virus Seroprevalence in Healthcare Workers in Kuala Lumpur, Malaysia

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## SUMMARY

Varicella-zoster virus (VZV) infections are a particular problem in healthcare settings. A survey of chickenpox was carried out amongst healthcare workers (HCWs) following potential ward exposures. A prior history of chickenpox was given by 61/98 (62.2%). Of 64 HCWs tested for VZV IgG, 10 (15.6%) were seronegative, indicating susceptibility. The sensitivity, specificity, positive predictive value, and negative predictive value of a history of prior chickenpox were 57.4%, 90%, 96.4%, and 31.0%, respectively. VZV screening of HCWs without a history of chickenpox, and vaccination of susceptible HCWs should be undertaken in this hospital.

## KEY WORDS:

*Varicella-zoster virus, Chickenpox, Health personnel, Malaysia*

Varicella-zoster virus (VZV) is highly transmissible via the respiratory route, and may cause severe clinical disease in immunocompromised patients and pregnant women. Therefore, infections in patients or staff are of particular concern in healthcare settings<sup>1</sup>.

Following potential ward exposures to VZV, 98 healthcare workers (HCWs) were surveyed for a prior history of chickenpox infection or vaccination, and offered serological testing for VZV IgG (Radim, Rome, Italy). The HCWs included nurses, attendants, clerical workers, and doctors. There were 88 women with a median age of 26.2 years. A positive history of chickenpox was given by 61 (62.2%), while 37 (37.8%) had no recall of previous chickenpox. Only 4 (4.5%) had been vaccinated.

A total of 64 HCWs were tested for VZV IgG, including 7 staff who did not answer the survey questions. Of these, 10 (15.6%) had no detectable IgG, and were thus susceptible to chickenpox. This relatively high proportion of susceptible adults is often seen in tropical countries like Malaysia, whereas in temperate countries, >90% of people over 15 years of age are immune<sup>2</sup>.

A total of 57 HCWs answered the survey questions and were tested for VZV IgG (Table I). The sensitivity and specificity of a prior history of varicella was 57.4% and 90%, respectively. Of 28 HCWs who recalled prior chickenpox, 27 were seropositive for VZV IgG (positive predictive value of 96.4%). Of 29 HCWs with no history of chickenpox, only 9 were seronegative (negative predictive value of 31.0%). Therefore, a positive history of chickenpox is a good predictor of immunity to VZV, whereas a negative history of chickenpox does not reliably predict absence of immunity. A high PPV and low NPV of a history of varicella is consistent with previous findings<sup>3</sup>.

Screening and vaccination of HCWs against VZV is thus recommended<sup>1,3</sup>, but implementation is less likely in developing countries with limited resources. However, HCWs in developing countries are likely to have higher VZV susceptibility rates than those in temperate countries<sup>2</sup>. Certainly, vaccination is not routine in Malaysian hospitals. A relatively high susceptibility to VZV amongst HCWs may contribute to hospital outbreaks, causing significant morbidity and costs<sup>4</sup>. Although there are few analyses from developing countries, some have suggested that screening those with no/uncertain chickenpox history, and vaccinating the susceptible staff is cost effective<sup>4,5</sup>.

Cost should not be of major consideration as it is the employer's responsibility to protect staff from occupationally-acquired diseases. In this survey, a significant number were women of child-bearing age, mainly nurses who are in constant contact with patients. In fact, 9.1% of them were pregnant at the time of survey. Of those women under 45 years, 8/52 (15.4%) tested negative for VZV IgG. These women are susceptible to severe complications like pneumonitis and congenital varicella if they are exposed to VZV while pregnant.

Between September 2006 and April 2008, nine inpatients tested positive for active VZV disease (positive VZV IgM or

Table I: Healthcare workers' history of chickenpox and VZV immune status

History of chickenpox	VZV IgG		Total
	Positive	Negative	
Positive	27	1	28
Negative	20	9	29
Total	47	10	57

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immunofluorescence of skin scrapings). The true incidence of VZV cases in this facility is probably higher, as clinical diagnoses are often made without laboratory tests. Therefore, exposure of HCWs to VZV cases is relatively common. In conclusion, VZV screening and vaccination of HCWs should be undertaken in this hospital.

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