کارگاه‌های آموزشی مرکز اطلاعات علمی

مقاله نویسی علوم انسانی

اصول تنظیم قراردادها

آموزش مهارت های کاربردی در تدوین و چاپ مقاله
Seroepidemiology of Varicella Zoster Virus among children, adolescents and medical students in a referral children medical center, Tehran, Iran

Pourakbari B1, Shahbaznezhad L2, Parvaneh N2, Nikkhah S1, Mahmoudi S1, Teymuri M1, Alyari AE2, Mamishi S1,2*

1Pediatric Infectious Disease Research Center, Tehran University of Medical Sciences, Tehran, Iran.
2Departments of Infectious Disease, Children Medical Center, Tehran University of Medical Sciences, Tehran, Iran.

Received: February 2012, Accepted: July 2012.

ABSTRACT

Background and Objective: Varicella is a benign childhood infection with considerable complication in none immune adults. The aim of this study was to survey Varicella Zoster Virus (VZV) seroepidemiology in children, adolescents and medical students in Children Medical Center, Tehran, Iran.

Material and Methods: In this cross sectional study, serum sample of children, adolescents 10 to 18 years old and medical students 18 to 25 years old were tested for VZV IgG with a commercial ELISA kit.

Results: A total of 412 individuals who were 10 to 25 years old were tested for VZV IgG with a commercial ELISA kit. Overall 269 individuals (65.3%) were seropositive for VZV IgG. Seroprevalence of VZV antibody increased with age of participants, from 59% in 10-11 years children to 80% in 20-21 years old young adult students, except in 22-23 and 24-25 years old, whom the frequency of positive results decreased interestingly to 41.7 and 52.8%, respectively. Prevalence of positive VZV antibody between two genders was not statistically different.

Conclusion: On-going monitoring of the seroepidemilogy of VZV is necessary to assess trends of infection in the community. A considerable proportion of young medical students in this study were still susceptible to VZV and consequent complications.

Keywords: Seroepidemiology, Varicella Zoster Virus, Children, Adolescents, Medical students

INTRODUCTION

Varicella is usually a mild and self-limiting disease in healthy preschool and school aged children (1). Nevertheless severe complications like cerebellar ataxia, encephalitis, varicella pneumonia (2-4) and bacterial super infection of skin and lung (5) especially in newborns, immunocompromised patients, adults and pregnant women has been reported. Although nearly 5% of all cases of varicella are adults (6), up to 70% of mortality is reported in adolescents and adults (7).

The epidemiology of varicella differs and this might be related to differences in population density and risk of exposure, environmental and social factors, humid conditions, or a combination of all these factors (1).

Attack rate of varicella infection following a house hold contact is about 65-85% in none immune individuals (8). Immunity to VZV is complex and not yet fully understood. Antibodies which develop following the rash of varicella may play a role in immunity to varicella and persist for many years (1). With no active immunization policy, increasing number of susceptible adolescents and adults, the era with greater risk for complications is inevitable.
In this study, the seroprevalence of varicella antibodies in children, adolescents and young medical students was evaluated in a tertiary Children Medical Center in Tehran, Iran.

**MATERIAL AND METHODS**

In this cross sectional study, the target population was children, adolescents and medical students aged 18 to 25 years old whom referred into medical center during 2008. Individuals who received blood or blood products for six month before study were excluded. After getting a signed informal consent about the aim of the study from students and parents of children, the questioner form including data of sex and age of the participants were recorded consequently. A 3 mls of venous blood sample obtained from individuals. Serum then separated and stored at -70° C for further testing. Commercial Enzyme Linked Immunoassay kit (Trinity Biotech, USA) used for detection of specific IgG antibodies against VZV. The assay was done in accordance with manufactures recommendations. Results were assumed positive if ratio value was more than 1.1 and assumed negative when value was less than 0.9. Equivocal samples retested. The sensitivity and specificity of kit were 99.4% and 97%, respectively.

Data were analyzed by SPSS software version 16. Basic descriptive analyses were utilized to summarize participants > characteristics (sex and age) and VZV seropositivity. VZV seropositivity compared in both sex and 8 separate age groups (10-11, 12-13, 14-15, 16-17, 18-19, 20-21, 22-23, 24-25 years) by chi square test. P value of less than 0.05 was considered as significant.

**RESULTS**

A total of 412 individuals who were 10 to 25 years of age participated in this study. Distribution of participants in separate age groups were: 10-11, n = 71; 12-13, n = 76; 14-15, n = 69; 16-17, n = 54; 18-19, n = 47; 20-12, n = 35; 22-23, n = 24; 24-25, n = 36. Mean age were 164.3± years and 219 (53.2%) were male. Overall 269 individuals (65.3%) were seropositive for VZV IgG. Seroprevalence of VZV antibody was increasing with age of participants, from 59% in 10-11 years children to 80% in 20-21 years old young adult students. In 22-23 and 24-25 years old frequency of positive results was decreased interestingly to 41.7 and 52.8%, respectively. Fig. 1 shows the frequency of positive VZV IgG in separate age groups. Prevalence of positive VZV antibody between two genders was not statistically different and in both groups were nearly 65% (P = 0.852).

**DISCUSSION**

More than 95% of infected people with VZV develop antibody against the virus (9), which remains detectable for a long period of time (10). Finding varicella specific antibody in serum samples is an accepted approach to epidemiological studies about previous varicella infection in the community.

In our study seroprevalence rate of VZV was nearly 65%. Sharifi and Emadi (11) in 2005 reported that 83.6% of individuals 1 to 60 years in Tehran were seropositive for VZV. Ziyaeyan and colleagues from the central region of Iran, Shiraz, reported that VZV IgG was positive in 66.3% of 1-70 years old individuals (12) that is closer to our results. The rates of seropositive VZV in other countries are 87.6% in South Korea (13), 85.6% in Slovenia (8), 80.8% in Brazil (14) and 78% in Turkey that are higher than our report (15).

According to our results nearly 40% of children less than 10 years old are susceptible to VZV (seronegative) that it is similar to other published result from Iran (11). In Turkey, 92.3% of children at the age of 10 years were seropositive (15). In another adjacent country, Pakistan with nearly tropical climate, the overall prevalence of seropositive VZV is 41.5% in the age group of 6-10 years and 42.5% in the 11-15 years age group (16).

Regional and geographical difference in seroprevalence of VZV was explained previously (17, 18). In temperate climates regions where varicella vaccination has not been implemented, primary varicella infection more often occur in younger
children (preschool) while in the tropical regions this infection is less frequently present in childhood
(5). The incidence of varicella infection has seasonal variation and occur more often in the winter and
spring (5), it may explain by the discrepancy between tropical and temperate regions.

Varicella may be considered as a nosocomial infection. Not only susceptible adult healthcare
workers are at greater risk of serious complication of this disease, but also they can infect susceptible
patients especially immunocompromised children and other adults. Distribution of seropositive status in
medical students was notably different in our study. Although more than half of them are taking part in
duties at hospitals and deal with patient care, they are still seronegative and susceptible to VZV infection.

There are some studies about seropositive status of healthcare workers (HCWs). In the western region
of our country, Kermanshah, 84.5% of HCW and medical students were seropositive (19). Seventy
one percent of HCWs in a general tertiary hospital in Tehran were seropositive for VZV (20). In other
countries the seroprevalence of varicella among medical students is greater than our reports. In
Germany and Switzerland, 97% of medical students is greater than our reports. In

Our study shows that varicella infection occurs in

8. Socan M, Berginc N, Lajovic J. Varicella susceptibility
and transmission dynamics in Slovenia. BMC Public
9. Glantz JC, Mushlin AI. Cost-effectiveness of routine
antenatal varicella screening. Obstet Gynecol 1998; 91:
519-28.
10. Amanna IJ, Carlson NE, Sliftka MK. Duration of
Humoral Immunity to Common Viral and Vaccine
11. Sharifi Z, Emadi Ghanjin S. The seroepidemiology of
Varicella Zoster Virus (VZV) in different age groups in
Tehran, Iran. Iran J Allergy Asthma Immunol 2005; 4:
95-98.
12. Ziyaeyan M, Alborzi A, Jamalidoust M, Moieni M,
Pourrabbas B. Seroepidemiology of Varicella Zoster
Virus Infection among 1-70 year individuals in Iran.
al. Seroprevalence of varicella-zoster virus in Korea. J
14. Latier MM, de Mones-Pinto MI, Wecks L.V. Prevalence
of IgG varicella zoster virus antibodies in the Kuikuro
and Kaiabi indigenous communities in Xingu National
Park, Brazil, before varicella vaccination. Rev Inst Med
Trop Sao Paulo 2005; 47: 139-142.
A. Seroepidemiology of varicella-zoster virus infection
in a cosmopolitan city (Erzurum) in the eastern Turkey.
16. Akram DS, Qureshi H, Mahmud A, Khan AA, Kundi
Z, Shafi S, et al. Seroepidemiology of varicella-zoster
virus infection in Pakistan. Southeast Asian J Trop Med
17. Tseng HF, Tan HF, Chang CK, Wang LY, Yang SE,
Liau MY, et al. A seroepidemiology study of varicella
among children aged 0-12 years in Taiwan. Southeast
18. Clemens SA, Azevedo T, Fonseca JC, Silva AC,
Silveira TR, Clemens R. Seroepidemiology of Varicella
in Brazil - results of a prospective cross-sectional study.
19. Farshchi A, Niayesh A. seroprevalence of Varicella
antibodies in healthcare workers in Imam Reza hospital
20. Talebi-Taher M, Noori M, Shamshiri AR, Barati M.
Varicella Zoster antibodies among health care workers
in a university hospital, Teheran, Iran. Int J Occup Med
21. Wicker S, Rabenau HF, Gottschalk R, Doerr HW,
Allwinn R. Seroprevalence of vaccine preventable and
bloodtransmissible viral infections (measles, mumps,
rubella, polio, HBV, HCV and HIV) in medical students.
Seroprevalence and immunization history of selected
vaccine preventable diseases in medical students.
کارگاه‌های آموزشی مرکز اطلاعات علمی

مقاله نویسی علوم انسانی

اصول تنظیم قراردادها

آموزش مهارت های کاربردی در تدوین و چاپ مقاله