

学位論文の要旨

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学位論文名 Seasonal Influenza Infection Risk Factors of Personnel at Shimane University Hospital

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論文内容の要旨

INTRODUCTION

Seasonal influenza infection control in hospitals is important for securing patient safety. An annual vaccination is recommended for hospital employees to avoid contracting seasonal influenza and spreading it to others, especially hospitalized patients. Influenza vaccination decreases the risk of complications and death among elderly people, children, and patients with underlying diseases. According to the website of the Ministry of Health, Labour and Welfare, influenza vaccination does not entirely prevent influenza infection but has a potent effect on the reduction of severity of the disease. However, the reported decrease in the incidence of influenza infection due to vaccination varies among studies.

Some employees at Shimane University Hospital (SUH) have to be absent because of influenza infection despite being vaccinated. We conducted this observational study to identify for risk factors for influenza infection.

MATERIALS AND METHODS

A questionnaire survey was administered to hospital employees at SUH, a tertiary and referral hospital with 600 beds, between the four seasonal influenza vaccination campaigns (2014/2015, 2015/2016, 2016/2017, 2017/2018). In this hospital, the seasonal influenza vaccination campaign starts on October 30 and ends by the second week in November. A

questionnaire survey has been administered since 2014 for the purpose of investigating the risk factors for influenza infection. This questionnaire assessed the following information: 1) age, 2) gender, 3) occupation, 4) whether the person had been vaccinated in the preceding fiscal year (preseason vaccination status), 5) whether the individual lives with children younger than 15 years of age, and 6) the respondent's history of seasonal influenza infection in the preceding season. A chi-squared test was used for the comparison between the two groups for each item. The odds ratio for influenza infection risk was calculated, and predictive factors for influenza infection were determined by using logistic regression analysis. The level of significance was set at $p < 0.05$.

This study protocol was approved by the Medical Research Ethics Committee of Shimane University.

RESULTS AND DISCUSSION

The numbers of vaccine inoculators and responders to the questionnaire during the study period were 7130 and 5891, respectively. Of 5891 respondents, we excluded 441 respondents who did not answer the question about the history of influenza infection, and thus, data from a total of 5450 employees were analyzed.

The seasonal influenza infection incidence during the whole period was 6.2%. The incidence rate was 5.3% in 2013/2014, 4.9% in 2014/2015, 6.7% in 2015/2016, and 7.5% in 2016/2017, respectively.

The incidence rates of seasonal influenza infection were significantly different between both genders. The total infection rate of females for all 4 seasons was significantly higher, odds ratio (OR): 1.36, 95% confidence interval (95% CI): 1.03-1.81, $p = 0.027$. No significant differences were observed in every season.

A significant difference in the distribution of infected subjects was found according to age. Employees aged 30-39 years were more susceptible to seasonal influenza infection than those aged 20-29 years (OR: 2.02, 95% CI: 1.51-2.71, $p < 0.001$) and those aged ≥ 60 years (OR: 4.21, 95% CI: 2.04 - 8.67, $p < 0.001$).

No difference was found in the incidence according to occupation. The incidence rate of seasonal influenza infection was 6.2% in vaccinated employees and 5.8% in unvaccinated employees ($p = 0.75$). No significant differences were observed in every season.

The incidence rate of seasonal influenza was higher in respondents living with children aged

<15 years old (with-children) than in those not living with children aged <15 years old (without-children) (OR: 2.19, 95% CI: 1.72-2.80, $p<0.001$). During 2015-2017, the infection rates were markedly higher in the with-children group than in the without-children group.

A significant difference was found for hospital employees in their 30s. Employees in their 40s also reported higher rates of influenza infection than other age groups. Moreover, the living together rate with children under fifteen in the 30s group was found to be 65.6% and the highest among generation groups. Subsequently, the living together rate with children were 57.3% in the 40s group, 14.5% in the 20s group and 14.7% in the 50s group, and 9.3% in the 60s group.

Furthermore, the incidence rate of seasonal influenza infection for females was significantly higher than that for males (6.6% for females and 4.9% for males; $p=0.03$), and the odds ratio of influenza infection for females was 1.36 (95% CI: 1.03-1.81). The rate of living together with children among males was 37.1%, and the rate among females was 37.9%, and no significant differences were found between the groups ($p=0.33$).

According to respondents' comments on the questionnaire sheets, some females stated that they did not want to be separated from their children. The association between influenza infection in children and influenza infection in hospital personnel could not be evaluated in this investigation. This study showed that the incidence rates were significantly high among female personnel in their 30s living with children.

CONCLUSION

For hospital personnel living with children younger than 15 years old, the OR of seasonal influenza infection was 2.19. These individuals have an increased risk of influenza infection.

Therefore, it is important for hospital employees to reduce the risk of influenza infection not only in the workplace but also at home. Hospital administrators should take many measures so that hospital employees do not catch seasonal influenza inside and outside of hospitals.