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Vaccination rates of healthcare workers vary according to their occupational group

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Abstract

Nosocomial infectious diseases (e.g. influenza, pertussis) are a threat particularly for immunocompromised and vulnerable patients. Although vaccination of healthcare workers (HCWs) constitutes the most convenient and effective means to prevent nosocomial transmissions, vaccine uptake among HCWs remains unacceptably low. Worldwide, numerous studies have demonstrated that nurses have lower vaccination rates than physicians and that there is a relationship between receipt of vaccination by HCWs and knowledge. Measures to improve vaccination rates need to be profession-sensitive as well as specific in their approach in order to achieve sustained success.

Selection and peer-review under responsibility of Prof. Ray Spier

Keywords: healthcare workers; influenza; pertussis; vaccination rates

1. Objectives

A series of nosocomial outbreaks of airborne infectious diseases worldwide show alarming evidence of a transmission of vaccine-preventable diseases in the healthcare environment [1]. Healthcare workers (HCWs) are at risk of occupational exposure to infectious diseases (e.g. influenza, pertussis) and may transmit the infection to their patients and co-workers. Encouraging HCWs to receive occupationally-recommended vaccines could play a vital role in preventing the transmission of vaccine-preventable diseases, and thereby reduce institutional outbreaks. The vaccination of HCWs plays an important part in

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prevention programs aimed at reducing infectious diseases-related morbidity and mortality (e.g. influenza, pertussis, measles) among high-risk patients [2].

Numerous studies have shown that nurses have lower influenza vaccination rates than physicians [3-6].

At the University Hospital Frankfurt nurses demonstrate seasonal influenza and pandemic influenza H1N1/2009 immunization rates which are between 2 and 2.5 times lower than the vaccination rates of physicians [7].

The purpose of this study was to identify the attitude of physicians and nurses towards pertussis immunization at a German university hospital. A further objective of the present study was to determine the correlation between the influenza and pertussis vaccination status among HCWs.

2. Methods

This study was conducted at the Frankfurt University Hospital (Germany), a 1,169-bed tertiary-care hospital with 3,900 employees (e.g., 726 physicians, 1,380 nurses, and 930 medical technicians) spanning 24 medical disciplines and research departments. The University Hospital has an annual admissions rate of approximately 47,200 in-patient and 220,000 out-patients.

From the beginning of January until the end of May 2010 HCWs (mostly physicians, nurses, nursing assistants, and medical technicians) and medical students were asked to complete an anonymous questionnaire. Questionnaires were distributed before regular occupational medical check-ups. The anonymous questionnaire comprised eight questions regarding demographic data, profession group, and influenza and pertussis immunization status.

2.1. Statistical analysis

Statistical analysis of the data and calculation of p values were calculated with χ^2 test two-tailed, using the BiAS program for Windows 9.04 (Epsilon Verlag, Hochheim Darmstadt 2007). Probability (p) values < 0.05 were defined as statistically significant.

3. Results

Overall, 32.3% (n = 1,258/3,900) of the HCWs of the University Hospital Frankfurt completed the anonymous questionnaire. Additionally, 246 medical students completed the survey. In total, 1,504 questionnaires were analyzed. Approximately 66.1% (n = 994/1,504) of the participants were female, 33.9% (n = 510) male, in accordance with the age and gender distribution of the employees and student body. Significant more physicians than nurses were vaccinated against influenza (Fig. 1), the same applies to pertussis ($p<0.05$).

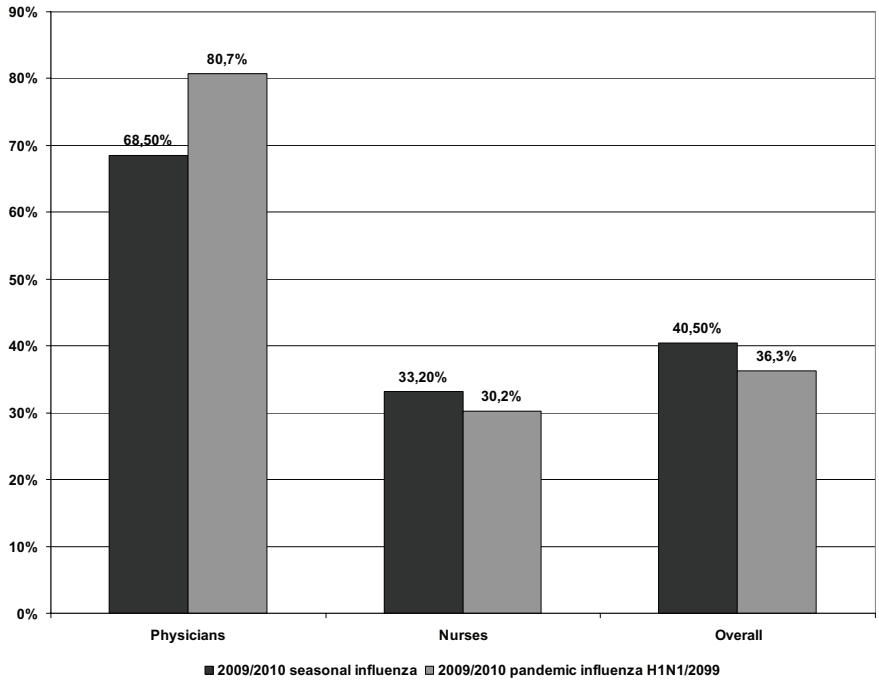

Fig. 1: Influenza vaccination rates among healthcare workers (HCWs) according to occupational group

In total, 72.4% of the HCWs who were vaccinated against pertussis were also vaccinated against influenza. Surprisingly, there was not such a strong correlation vice versa – only 34.2% of HCWs who had the influenza vaccine were also vaccinated against pertussis. A strong correlation between the immunization status of pertussis and influenza was found among physicians: overall, 93.1% of physicians who were vaccinated against pertussis were also vaccinated against influenza. Nurses showed significant weaker correlation rates ($p<0.05$) as well as lower vaccination rates ($p<0.05$) (Table 1).

Tab. 1: Pertussis and influenza immunization status and its correlation
(e.g., 93.1% of the physicians who were vaccinated against pertussis were vaccinated against influenza as well; reciprocally, 58.9% of the physicians who were vaccinated against influenza were vaccinated against pertussis as well).

Immunization status	Physicians (n=390)	Nurses (n=530)	p-value	Overall (n=1,504)
Influenza	76.2%	32.1%	p<0.05	46.8%
Pertussis	48.2%	13.4%	p<0.05	22.1%
Pertussis & Influenza	93.1%	39.4%	p<0.05	72.4%
Influenza & Pertussis	58.9%	16.5%	p<0.05	34.2%

4. Conclusion

Our findings indicate that there seems to be a different perception of the benefit of immunizations among occupational groups. Nurses demonstrate influenza and pertussis vaccination rates which are between 2 and 3 times lower than the vaccination rates of physicians [8].

Our data clearly shows that there is a strong correlation between the immunization status of pertussis and influenza, especially among physicians. Overall 93.1% of physicians who were vaccinated against pertussis were vaccinated against influenza as well.

Consequently, the question arises: Why does the influenza and pertussis vaccination program at the university hospital Frankfurt work among physicians, but fail among nurses? Despite working at an university hospital with widespread education and convenient immunization access, a large proportion of nurses were reluctant to get vaccinated against influenza in the recent years [2].

Studies conducted in several countries have shown that there is a relationship between receipt of the influenza vaccination by HCWs and knowledge [9-11]. Significantly higher knowledge scores were obtained by HCWs who had been vaccinated compared to those who were unvaccinated [9]. A Swiss study provided evidence of strong associations between information receipt, knowledge and immunization status [12].

Numerous studies indicate that vaccination campaigns have a proven positive effect on vaccination uptake among HCWs, but physicians are significantly more likely to accept vaccination and to switch from “non-vaccinated” – to “vaccinated” HCWs [9,13].

Efforts should be focused on identifying the best ways of distributing information on occupationally required vaccines to HCWs. Education programs ought to address the most frequent anti-vaccination-beliefs, because when concerns are addressed, coverage rates might increase.

However, combating vaccine misinformation with education is necessary, but often not sufficient [14].

Measures to improve vaccination rates may need to be profession-sensitive as well as specific in their approach because levels of knowledge and attitudes regarding occupationally-recommended vaccinations vary widely among different occupational groups.

Key messages:

- Nurses have lower influenza and pertussis vaccination rates than physicians ($p<0.05$).
- Overall 93.1% of physicians who were vaccinated against pertussis were also vaccinated against influenza.
- Our data clearly shows that there is a strong correlation between the immunization status of pertussis and influenza, especially among physicians.
- Measures to improve immunization rates may need to be profession-sensitive.

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