

Influenza vaccine coverage for healthcare workers in geriatric settings in France

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ABSTRACT. Background and aims: Because of a relative lack of efficiency of influenza vaccine in the elderly population, influenza outbreaks in geriatric healthcare settings are probable, despite high influenza vaccination rates in patients. Nosocomial influenza outbreaks, more probably related to healthcare workers, have also been reported. Therefore, vaccination of healthcare workers is considered to be an important preventive policy, to decrease the in-hospital influenza burden during the viral circulation period. **Methods:** This multicenter study measured influenza vaccine coverage of Health Care Worker in 102 geriatric healthcare settings (acute care, rehabilitation care, long-term care) by a first questionnaire. A second questionnaire assessed main factors associated with vaccine acceptance. **Results:** 102 geriatric healthcare settings (20%) answered the first questionnaire. Vaccine coverage for physicians ($n=187$), nurses ($n=631$) and nurse assistants ($n=1487$) were 48.4%, 30.5% and 27.9%, respectively. Vaccination rates were correlated between occupational categories according to healthcare settings. Vaccination rates were significantly lower in acute care settings compared with rehabilitation and long-term care settings. Local recommendations was reported for 29.9%, but was not correlated with vaccine coverage. The second questionnaire showed that lack of motivation and knowledge, and organizational problems were the three main reasons for reluctance to be vaccinated. **Conclusions:** In French geriatric settings, influenza vaccine coverage of health-

care workers is low and highly variable, according to the type of healthcare setting. A group effect was found between occupational categories. However, the reasons for non-acceptance need further evaluation to improve HCW influenza vaccine coverage. (Aging Clin Exp Res 2006; 18: 512-516)

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INTRODUCTION

Annual immunization with inactivated influenza vaccine is efficient in preventing influenza-associated mortality and morbidity (1-4) and is considered as the best cost-effective strategy in elderly individuals (5). However, the immune response to influenza vaccine, as measured by antibody titres, is lower in the elderly than in young adults (6). The immune response covers only 30% to 70% of vaccinated elderly patients, according to viral strains, health, and nutritional status (6). Yet influenza outbreaks have been described despite high influenza vaccination rates in patients (7-10). Nosocomial influenza outbreaks have also been confirmed, and transmission was more probably related to healthcare workers (HCW) (2, 8). Therefore, HCW vaccination is considered as an important preventive policy to decrease the in-hospital influenza burden during the flu season. In addition, mortality in institutionalized elderly patients is decreased by high vaccine coverage in HCW (11). Therefore, for several years, international and national recommendations have been made to promote HCW influenza vaccination (12, 13). In France, HCW vaccination has been recommended by national ad-

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ministration since 1999 (13). However, HCW influenza vaccine coverage in high-risk settings such as geriatric wards have not yet been assessed.

This study was designed to measure HCW influenza vaccine coverage in various types of geriatric settings in France, and to assess the main reasons for refusal to be vaccinated.

METHODS

An observational multicenter survey in geriatric settings in France was carried out from January to June 2003, in four types of geriatric healthcare settings: acute care, rehabilitation care, long-term care, and nursing-homes. Two questionnaires were designed by members of the ORIG association. In January 2003, the first questionnaire was sent to 530 geriatric healthcare settings with a covering letter explaining the aims of the study. It asked for demographic information (number of beds and patients, residents), number of HCW (physicians, nurses, and nurse assistants) and number of HCW who received influenza vaccine for each staff category (2002-2003, winter season). It also asked about the existence of local recommendations (written policies) by local occupational medicine or hygiene units to promote influenza vaccination of HCW.

The second questionnaire was sent in June 2003, to units where vaccination uptake was under the median score found in the first questionnaire (n=51). Each answer sent back presented the reasons for declining influenza vaccination from all the HCW of the facility. The questionnaires included seven major questions and one open question (lack of resources, lack of time, adverse effects, inefficiency, refusal of any vaccine, don't know, allergy, other reasons).

Statistical analyses were performed with SPSS (11.1 version, 2001). Because many variables were non-nor-

mally distributed, non-parametric tests were used both for comparisons (Fisher exact test, Mann-Whitney test, and Kruskal Wallis test, when covariates had more than 2 levels) and for correlations (Spearman test). For subgroup analysis, nursing-homes were excluded from analysis, because of a low denominator.

RESULTS

The response rate for the first questionnaire was 20% (102 healthcare settings) from 74 districts of France. The number of beds was 8082, and analysis covered 2315 HCW, including 187 physicians, 631 nurses and 1497 nurse assistants. The 102 healthcare facilities represented all regions of France: 431 HCW were from the north, 269 from the west, 561 from the east, 498 from the south-west and 556 from the south-east regions.

The overall influenza vaccine coverage for healthcare workers was 31.2%. Vaccination rates were significantly lower in acute care settings (30%), compared with rehabilitation care (32.5%) and long-term care (31.1%). There were no differences according to region. Of 187 physicians, 631 nurses and 1497 nurse assistants, 48.2%, 30.9% and 29% were vaccinated respectively (Table 1). Physicians were significantly more frequently vaccinated than nurses or nurse assistants. However, according to setting, vaccine coverage for nurses was significantly higher in rehabilitation and long-term care than in acute care settings. Physicians were more frequently vaccinated in rehabilitation care than in acute care settings; there was no difference according to the type of healthcare setting for nurse assistants (Table 1).

There were some significant correlations between vaccination rates of occupational categories. However, these correlations were higher between nurses and nurse assistants than between physicians and nurses, and be-

Table 1 - Characteristics of healthcare settings, health care worker influenza vaccination rates according to occupational categories, and local recommendations in various settings.

	Acute care	Rehabilitation	Long-term care	Nursing-home	Total
Units (number)	8	20	68	6	102
Beds (n)	246	954	6563	319	8082
Patients (n)	203	923	6458	315	7899
Female/male	0.56	1.98	2.47	3.4	2.42
Age (years)	83.9	82.1	82.9	84.4	83.0
Physician vaccination rate, n (%)	14/34 (41.1) ^a	28/52 (53.8) ^{b,c}	45/96 (46.9) ^c	3/5 (60.0)	90/187 (48.2) ^c
Nurse vaccination rate, n (%)	15/62 (24.2)	44/136 (32.4) ^b	128/407 (31.4) ^b	8/26 (30.8)	195/631 (30.9)
Nurse assistant vaccination rate, n (%)	28/94 (30.1)	59/215 (27.4)	335/1135 (29.5)	12/53 (22.6)	434/1497 (29.0)
Recommendation for vaccination					
Yes	2 (25)	6 (30.5)	21 (30.9)	1 (20)	30.5
No	3 (37.5)	7 (35)	37 (54.4) ^b	4 (80)	44.8
Unknown	3 (37.5)	7 (35)	10 (14.7)	(0)	23.8

^ap<0.05 compared with nurses; ^bp<0.05 compared with acute care; ^cp<0.05 compared with nurses and nurse assistants

Table 2 - Coefficient of correlations (*r*) of vaccine coverage between occupational categories in various types of healthcare settings.

Settings	Acute care (n=8)	Rehabilitation (n=20)	Long-term care (n=68)	Total
Physician - Nurse	0.28	0.40 ^a	0.18	0.26 ^a
Nurse - Nurse Assistant	0.47	0.85 ^b	0.44 ^b	0.55 ^b
Physician - Nurse Assistant	0.64	0.54 ^a	0.29 ^a	0.33 ^a

^a*p*<0.05; ^b*p*<0.001 (Spearman test)

tween physicians and nurse assistants (Table 2). These correlations were also different according to setting (Table 2); there was no correlation in acute care settings, and high correlations in rehabilitation and long-term care settings.

There were local recommendations for HCW vaccinations in 29.9% of healthcare facilities. There were significantly lower recommendations in long term-care. There was no correlation between recommendations and HCW vaccination rates in any type of healthcare setting whatever the occupational category.

The response rate for the second questionnaire was 51% (26/51). From 51 responding units (1 acute care setting), the three main reasons were lack of interest, 73% (refusal of any vaccine, don't know, or lack of motivation), lack of knowledge about influenza vaccine, 36.5% (inefficiency, allergy) and organizational problems, 23.1% (organizational problems with occupational medicine, lack of time). Only descriptive data are presented, because of the low numbers of responders.

DISCUSSION

Vaccination of HCW against influenza is considered a component of prevention (2, 13, 14), because it can decrease the risk of outbreaks in healthcare settings by providing a "herd immunity". Despite national and international recommendations to vaccinate HCW against influenza, several even recent studies report low vaccination rates among HCW (12, 15-21). Studies on HCW influenza vaccination in geriatric healthcare settings are of great interest, because the elderly population, especially those living in long-term care, has both the highest severity of the disease and the worst immune response to the vaccine. This suggests that abolishing potential infected contacts between the elderly and the influenza virus may be one of the most important goal for prevention in geriatric settings. The present study is the first one in France measuring HCW influenza vaccine coverage in this setting. In Europe, only a few countries are able to measure HCW vaccine coverage (18) and, despite recommendations, vaccination rates vary from 15 to 25% (18, 22). In the United States, large variability has recently been reported, ranging from 10% to 75% (17, 21, 23, 24) but the Advisory Committee on Immunization Practices reports vaccination rates of 38.4% (12) and a survey in a long-term

care setting showed a rate of 39% (23). In France, a study based on phone calls supported by the "Groupe d'Etude et d'Information sur la Grippe" reports an annual immunization of 15% among HCW (25). The overall rate of the present study is low (31.2%) but higher than previous unpublished reports in France (25, 26). However, in a teaching hospital in Marseille (France), an influenza vaccination program by mobile cart reached an overall vaccination rate of 53% over a 3-year period (27). In addition, HCW influenza vaccine coverage in geriatric wards is often higher than in other wards (17, 19). In addition, the overall vaccination rate of 31.2% which we found is probably representative of healthcare settings prior active influenza vaccination programs.

Our study showed that, in all healthcare settings, nurses and nurse assistants were significantly more reluctant to be vaccinated than physicians. This has already been showed in many different wards (17, 19, 27) including long-term care settings (15, 23). The lack of knowledge of nursing staff may be a reason for declining vaccination, which is not a reason found in physician groups (17); no data in the present study can confirm it.

Our survey also showed that vaccination rates were significantly lower in geriatric acute care compared with other types of healthcare settings. However, these findings seem to be related to occupational groups, because higher vaccination rates were found in nurse and physician groups but not in the nurse assistant group (Table 1). To our knowledge, no previous study has reported such results. Because no statistical analysis could be performed concerning the reasons for declining vaccine, the differences between healthcare settings are difficult to explain. However, several interpretations may be attempted: i) positive correlations between occupational groups found in rehabilitation and long-term care settings, together with significantly higher vaccination rates in these settings than in acute-care ones, suggest a "group effect". It has recently been reported that a physician influences vaccination acceptance among other occupational groups in long-term care settings (23). However, it must be noted that, in the present study, the correlation between nurses and nurse assistants was higher than between physicians and other HCW (nurses and nurse assistants). This suggests that nurses, as a leader group, may be an efficient target for

HCW vaccination programs; ii) reasons for refusing vaccination are numerous: lack of motivation, lack of knowledge, and organizational problems were the main reasons we found and have also been reported in other studies carried out in various countries (2, 17, 19, 24, 27). It may be postulated that organizational problems, such as lack of time, may be more important in acute care settings; iii) it may also be related to greater interest (higher motivation) in influenza vaccination in settings where HCW have longer contact times with patients. This hypothesis needs further researches, especially in the sociological field.

Local recommendations were low, but no correlation with vaccination rates was demonstrated. This suggests the inefficiency of simple nation-wide and local recommendations, as reported elsewhere (e.g., 28). The active programs performed in various locations which improve vaccination rates significantly support this hypothesis (15, 19, 24, 27, 29).

Our study has some limitations; there was one questionnaire for each centre, and no verification concerning standardization of data collection. This may have induced some bias in overall vaccination rates. However, because of the high number of HCW included in the survey, our findings probably reflect reality. The second questionnaire included questions regarding motivation, knowledge and attitudes, as in other surveys, but the number of questions was too low to determine specific goals for vaccination programs. Answers also reflected a group opinion, which decreased the precision of responders. This may explain why only 51% of settings answered the second questionnaire. This latter statement also does not support the extrapolation of our findings to the whole French geriatric HCW population. However, the three main reasons we found were similar to those reported in previous studies in other countries (17, 19, 20, 23).

CONCLUSIONS

Despite nation-wide recommendations for more than five years in France, there are still low vaccination rates among HCW in institutions where high-risk patients are numerous, such as geriatric healthcare settings. Nation-wide and local recommendations are not enough to promote vaccination, and properly concerted and tailored programs are necessary. Because of differences in occupational groups and types of healthcare settings, organizational, occupational and socio-cultural reasons for refusing vaccination need to be further assessed before implementing influenza vaccination programs to improve coverage.

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