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Factors associated with continued adherence to influenza vaccination in the elderly

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ABSTRACT

Objective. We aimed to analyze the factors influencing continued adherence to influenza vaccination in elderly persons vaccinated in the preceding season.

Methods. Using a population-based vaccination registry, we evaluated the proportion of persons vaccinated against influenza in Navarre, Spain, in the 2010–11 season among non-institutionalized persons aged 65 years or over who had been vaccinated in the 2009–10 season. Logistic regression was used to analyze the influence of sociodemographic, clinical and health care factors.

Results. Of the 64,245 persons vaccinated against influenza in the 2009–10 season, 87% were vaccinated in the 2010–11 season. Continued adherence to vaccination increased with the number of physician visits per year. It was lower in women, in the 65–69 and ≥95 year age-groups, in those hospitalized or diagnosed with any major chronic condition in the previous year, and in persons with hematological cancer or dementia. Health districts and physicians with higher coverage in the previous season continued to have higher adherence in the following season.

Conclusions. People vaccinated against influenza in one season tend to be vaccinated in the following one. Sociodemographic, clinical and health care factors have a moderate effect on the continuity of vaccination, with the most important factor being the treating physician.

Introduction

Recommendations for preventing the morbidity and mortality due to seasonal influenza include annual vaccination of all people aged 65 and over (Fiore et al., 2010). However, the vaccine coverage reached in this population group is far from the 75% target proposed by the World Health Assembly for 2010 (Davidson et al., 2003; World Health Organization, 2003). This highlights the importance of identifying possible ways to widen coverage. Interventions to improve vaccination coverage should emphasize two points: attracting people who do not usually get vaccinated and retaining those who have been vaccinated in previous seasons.

Several studies have described the variables that are associated with influenza vaccination, including sociodemographic, clinical and physician-dependent factors (Abramson and Levi, 2008; Blank et al., 2008; Blank et al., 2009; Chiatti et al., 2011; Frank et al., 1985; Sarriá-Santamera and Timoner, 2003).

Population-based vaccination registries have been shown to be useful in identifying areas with the potential to improve vaccination coverage and in monitoring the results of vaccination campaigns (CDC, 2001; Kempe et al., 2004; Rodríguez-Rieiro et al., 2010). In Navarre, Spain, this methodology showed that continual improvements in influenza vaccination coverage among persons aged 65 and over were achieved between the 2006–07 and 2009–10 seasons, but this trend was reversed between the 2009–10 and 2010–11 seasons when coverage fell from 63% to 59%, whereas there was no change in the vaccination program. Continued adherence to influenza vaccination is critical to maintaining high coverage in successive seasons in population groups for whom the vaccine is indicated. Accordingly, we proposed to analyze the factors influencing continued adherence to influenza vaccination in the 2010–11 season among non-institutionalized persons aged 65 years and over who had been vaccinated in the previous season.

Methods

Setting, sources of information and influenza vaccination campaign

The Regional Health Service of Navarre, Spain, provides free health care to approximately 97% of the population of the region (636,924 inhabitants). The population is distributed according to place of residence into health districts, each of which has a health care center. A team of 4 to 14 primary care physicians provides medical consultations in each center and coordinates preventive programs. An average of 1176 persons is assigned to each physician who directs all their health care. In 2004 the computerized medical record was

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implemented throughout the entire health care network, in both hospitals and primary care. A specific section in the computerized medical record is provided to register vaccinations. Whenever health professionals administer a dose of vaccine they must register the vaccination data online.

In the 2010–11 season, the influenza vaccination campaign in Navarre took place from 11 October to 26 November 2010. Vaccination was also available after this period, but only 1.3% of the vaccines were administered after the campaign. The vaccine was indicated for all persons aged 60 and over, and for those with major chronic conditions that increase the risk of influenza complications. The vaccines for this program were purchased centrally by the regional government and were distributed to all primary health care centers. Before the vaccination campaign began, an information campaign focusing on the target population was carried out by means of posters in the health centers and notices in the media to let people know the population groups in whom the vaccine was indicated and where they could go to be vaccinated. Physicians and nurses in primary care centers were sent a detailed protocol of the program. The primary health care teams and each individual physician were encouraged to incorporate strategies to improve vaccination coverage among their patients.

Study population and variables

The study population included non-institutionalized persons aged 65 and over who were registered in the Navarre Health Service at the beginning of the 2010–11 influenza season and who had received the seasonal vaccine during the 2009–10 season. From the health care databases we obtained the following variables: sex, age, migrant status, living with children under 15 years of age, 2010–11 seasonal vaccination, major chronic conditions, number of physician visits in the previous year, hospitalization during the previous year, health district and physician.

All doses of the 2010–2011 seasonal influenza vaccine were considered, whether they were administered during or after the vaccination campaign.

The major chronic conditions were defined according to the International Classification of Primary Care version 2 (ICPC-2, 1998) and included: heart disease (K71, K74–77, K81–K84, K99), lung disease (R79, R95, R96, R99), renal disease (U99), haematological cancer (B72–B74), non-haematological cancer (A79, D74–D78, F74, H75, K72, L71, N74, N76, R84, R85, S77, S79, T71, T73, U75–U77, U79, W72–W73, X75–X77, X81, Y77–Y79), diabetes (T89, T90), cirrhosis (D97), dementia (P70), stroke (K90, K91), immunodeficiency (B78, B79, B90, D28, K28, U28), rheumatic disease (L88) and morbid obesity (body mass index of 40 kg/m^2 or greater).

The Navarre Ethical Committee for Medical Research approved the protocol for this study.

Analysis

We evaluated continued influenza vaccination during the 2010–11 season in those persons who had been vaccinated in the 2009–10 season, as well as the variables associated with adherence to vaccination. Logistic regression techniques were used to obtain crude and adjusted odds ratios (OR).

The influence of health district and primary care physician on patients' continued adherence to influenza vaccination was evaluated in two analyses. Health districts and physicians were first grouped into quartiles based on the percentage of vaccination adherence during the 2010–11 season among patients who had been vaccinated in the 2009–10 season. In the second analysis, they were grouped into quartiles based on the coverage of seasonal influenza vaccination in their patients in the 2009–10 season. Both analyses were adjusted for the rest of the covariates.

The statistical package used was SPSS 18.0.

Results

The study included the 64,245 non-institutionalized persons aged 65 and over who had been vaccinated against seasonal influenza in the 2009–10 season. Some 56% were women, and 84% were between 65 and 84 years of age, with a mean age (±standard deviation) of 76.7 (±7.4) years. About 63% had some type of chronic disease.

Overall, 87% continued to be vaccinated against influenza in the 2010–11 season, a percentage that varied moderately depending on some of the variables analyzed. It was lower in women (86%), in the 65–69 and ≥95 year age groups (85%), in immigrants (77%), in persons hospitalized in the previous year (83%), in persons diagnosed with any major chronic condition in the previous year (86%), and in those who lived with children under age 15 (85%). In the multivariate logistic regression analysis, these differences remained statistically significant (Table 1).

Continued vaccination adherence was also lower in patients with hematological cancer (83%) and in those with dementia (85%), whereas other major chronic conditions were not associated with differences in adherence. When the major chronic conditions were considered separately with the other covariates in the logistic regression analysis, continued adherence to vaccination was significantly lower in patients with hematological cancer (OR = 0.76; 95% CI 0.62–0.93) or dementia (OR = 0.85; 95% CI 0.76–0.94) (Fig. 1).

To evaluate the role of the health district and primary care physician, these two variables were grouped into quartiles based on the percentage of continued adherence to influenza vaccination among their respective reference populations vaccinated in the previous season. Adherence to influenza vaccination differed significantly between the lowest and highest quartiles for health districts (from 83% to 90%) and for physicians (from 81% to 92%). These differences remained after adjusting for the covariates listed in Table 1, with an OR of 1.28 (95% CI 1.18–1.39) between the extreme quartiles of health districts and an OR of 2.58 (95% CI 2.38–2.79) between the extreme quartiles of physicians (Table 2).

To evaluate the extent to which these differences in continued adherence were related to initial vaccination coverage in each health district and for each physician, the two variables were grouped into quartiles based on the seasonal influenza coverage achieved in their respective populations in the 2009–10 season. Physicians in the quartile with the lowest coverage in the 2009–10 season had the lowest continued adherence in their patients in the following season (84%), whereas continued adherence was highest (88%) among those in the quartile with the highest coverage in the previous season. This association remained in the analysis adjusted for the other covariates mentioned, with an OR of 1.34 (95% CI 1.24–1.46) for the comparison between the extreme quartiles. A similar association was observed in the comparison of health districts (OR = 1.20; 95% CI 1.09–1.31) (Table 3).

Discussion

The results show high continued adherence (87%) to influenza vaccination among non-institutionalized persons aged 65 and over who had received the vaccine in the previous season. The fact that the Navarre Health Service recommends the influenza vaccine and offers it free to the entire population aged 65 and over probably contributed to this high adherence, and suggests that health system factors related to patients' access to vaccination are unlikely to have played an important part.

Despite this high adherence, there is still room for improvement. We detected small variations in adherence for some of the variables analyzed which in turn are consistent with those that have been associated with differences in influenza vaccination coverage in previous studies (Evans and Watson, 2003; Sarriá-Santamera and Timoner, 2003). The multivariate analysis showed lower adherence in women, in immigrants, in persons who had been hospitalized in the previous year, and in those who lived with children under 15. The poorer adherence among immigrants could be related to their greater geographic mobility, which may result in their being away from their usual home during the vaccination campaign.

In persons who have been diagnosed with a major chronic condition or who have been hospitalized recently, concerns about their health problems might lead them to neglect preventive measures, despite the fact that influenza vaccination could be highly beneficial in this group. Ceasing regular influenza vaccination in seniors could occur after a sudden decline in health status and has been associated with an increased