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Influenza vaccination of elderly: relaunch time

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Abstract

Influenza can be a serious disease and constitutes a threat to the population. Every year, seasonal influenza epidemics affect about 5-15% of the world's population. Some frail categories (such as the elderly) can develop complications, request hospitalization, and may die. In order to reduce the medical, social and economic burden of influenza, vaccination is recommended by many health authorities worldwide.

Italy has a national programme of influenza vaccination which targets specific categories, such as subjects with chronic conditions, pregnant women, healthcare workers and those over 65 years old. Despite this opportunity for prevention, however, vaccination coverage in Italy does not reach the minimum recommended threshold of 75%.

This paper reports some interventions that can improve coverage rates of the elderly, such as "tailor-made" information campaigns, healthcare workers training and the adoption of innovative communication strategies in order to implement vaccination strategies that take into account the needs of the elderly population, the involvement of elderly people's associations in awareness-raising activities and strengthening the role of general practitioners in promoting influenza vaccination.

Background

Every year, seasonal influenza has a significant epidemiological, clinical and economic impact (1-3). According to recent World Health Organization (WHO) estimates, about 5-15% of the world's population is affected by influenza-like illness (ILI) each year, resulting in 3-5 million serious cases and 250,000-500,000 deaths (4). Annual epidemics are associated with high morbidity and mortality worldwide. In Europe, the European Centre for Disease Prevention

and Control (ECDC) estimates that, on the average, every year 40,000 subjects die prematurely as a result of influenza infection; 90% of these deaths occur among subjects over 65 years of age, especially those with chronic underlying diseases (5).

Owing to the high burden of influenza, the WHO's Global Influenza Surveillance and Response System monitors virus evolution, updates seasonal influenza vaccine composition, and serves as an alert mechanism for influenza viruses with pandemic potential (6).

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In Italy, INFLUNET, the national influenza surveillance system, records from 5 to 8 million cases of ILI per year (7). The data from the last 10 influenza seasons (2007 - 2017) reveal that the highest incidence of illness occurs in young children (0-4 years), while the age-class with the greatest risk of complications, hospitalization and death is that of the elderly (7).

Other influenza surveillance systems are active in Italy, such as monitoring access to the Emergency Departments (ED) and syndromic surveillance. However, these systems do not cover the entire country. Since the pandemic season (2009/10), a dedicated surveillance system run by 11 Italian Regions has monitored the trend in serious and complicated cases of influenza. In the 2016/2017 season, 219 serious cases were registered and 53 people died. The median age of patients with severe disease was 72 years (range 0-94). In 95% of serious cases and 100% of fatal cases, the patients had at least one underlying chronic disease, the most common being cardiovascular disease (74%), followed by chronic respiratory disorders (63%), diabetes (45%) and obesity (31%). In most severe cases, A/H3N2 virus (63%) was detected, followed by A/H1N1pdm09 virus (6%) and B virus (4%). In 69% of fatal cases, A/H3N2 virus was isolated, while A/H1N1pdm09 virus was isolated in 10% (8). Mortality varies from year to year, depending on vaccine effectiveness, the intensity of the influenza epidemic, the virulence of the circulating virus and the pre-existing immunity level of the population.

Decisions concerning immunization programmes should take into account many aspects: disease burden, vaccine-specific issues such as vaccine performance and safety, programme impact, programmatic issues, logistical questions, and political will.

Here, we present several potential strategies that could be implemented in order to increase coverage rates in elderly.

Influenza Prevention

Routine annual vaccination is the most effective means of avoiding influenza illness, reducing the associated complications and, consequently, reducing the impact of epidemics (9-11).

The WHO recommends seasonal influenza vaccination for those people who are most at risk of developing serious complications; priority groups for vaccination include: the elderly, subjects with certain chronic diseases, pregnant women, healthcare workers and children aged 6-59 months (12).

Increasing seasonal influenza vaccination coverage among these groups is fundamental for reducing the burden of influenza in the European Union (EU). WHO/Europe also monitors seasonal influenza vaccination coverage and policies in the EU in order to provide technical assistance for EU Member States that are expanding their seasonal influenza vaccination programmes (13).

In Italy, vaccination is offered free of charge to specific categories, such as subjects with chronic conditions, pregnant women, healthcare workers and subjects over 65 years of age (14).

The Italian National Health System, in collaboration with the Regional Authorities, usually launches influenza immunization programmes in late October, as the best time to vaccinate is between October and December, before influenza begins to spread in the community (14).

Influenza vaccines of the elderly

Currently, in Italy, four types of flu vaccines are used for the seasonal vaccination campaign: trivalent inactivated vaccines split or subunit (TIVs), trivalent inactivated vaccine adjuvanted with MF59® (aTIV) and quadrivalent split vaccines (QIV) (14). National and international studies have demonstrated the public health benefits of vaccination, particularly when the vaccine

strains match with circulating strains (15-20).

Some examples of studies aimed at investigating the effectiveness of vaccination in the elderly are reported below.

Gross et al. (21) reported that TIVs were effective against a variety of influenza-related outcomes. In 20 studies examined, 56% effectiveness (95% CI: 39-68%) was demonstrated in preventing any respiratory illness, 53% (95% CI: 35-66%) in preventing pneumonia, 48% (95% CI: 28-65%) in preventing hospitalizations and 68% (95% CI: 56-76%) regarding the outcome of all-cause mortality. Respect to Gross et al., a meta-analysis of effectiveness of influenza vaccine in persons aged 65 years, performed by Vu et al. (22) reported lower values. Influenza vaccination has been shown to be effective in reducing ILI [35% (95% CI: 19-47%)], ILI hospitalization and influenza [33% (95% CI: 27-38%)], mortality following hospitalization for ILI and pneumonia [47% (95% CI: 25-62%)] and all-cause mortality [50% (95% CI: 45-56%)].

MF59-adjuvanted seasonal influenza vaccine was the first vaccine specifically designed to overcome the phenomenon of immunosenescence and to improve vaccine efficacy in the elderly (23). A very recent systematic review and meta-analysis (24), conducted on the effectiveness of MF59-adjuvanted seasonal influenza vaccine in the elderly, showed an adjusted effectiveness of aTIV of 51% (95% CI: 39-61%) in preventing hospitalizations for pneumonia/influenza among community-dwelling seniors. Pooled results of the adjusted vaccine effectiveness against laboratory-confirmed influenza were also high (60.1%). Other single community-based studies have reported very high effectiveness of aTIV in preventing hospitalizations for acute coronary [87% (95% CI: 35-97%)] and cerebrovascular [93% (95% CI: 52-99%)] events (24). aTIV proved highly effective

[94% (95% CI: 47-100%)] in reducing ILI among institutionalized elderly subjects. Furthermore, aTIV displayed greater efficacy than non-adjuvanted vaccines in preventing hospitalizations due to pneumonia/influenza [adjusted risk ratio 0.75 (95% CI: 0.57-0.98)] and laboratory-confirmed influenza [adjusted odds ratio 0.37 (0.14-0.96)] (24).

As quadrivalent vaccines have been recently licensed, no effectiveness studies performed in the elderly have been published so far.

As TIVs are used from long time, the administration of millions of doses did not highlight safety problems (25, 26). A good safety profile was also demonstrated for aTIV (27) and QIV (28).

Influenza vaccine coverage

Although vaccination can effectively prevent influenza illness, vaccination coverage in Italy does not reach the minimum recommended threshold of 75% (Figure 1). Indeed, a downward trend of coverage in the elderly has been observed since the pandemic season of 2009-2010, and the average national coverage rate has fell from 65.6% in 2009-2010 to 49% in 2014-2015 (minimum value); a slight upward trend was observed in the 2016-2017 season, when coverage reached 52.6% (Figure 1).

This unsatisfactory level of coverage results in an excessive recourse to Emergency Departments (EDs) and in an increase in hospital admissions for complications in the elderly during epidemic peaks, causing organizational strain and increasing direct health costs (29-33).

In order to improve vaccination coverage, it is necessary to plan and implement vaccination promotion strategies by adopting new methodological approaches. These should take into account the fact that the goals of the vaccination campaign are to reduce the number of individuals at risk of illness, hospitalization and death, and to alleviate

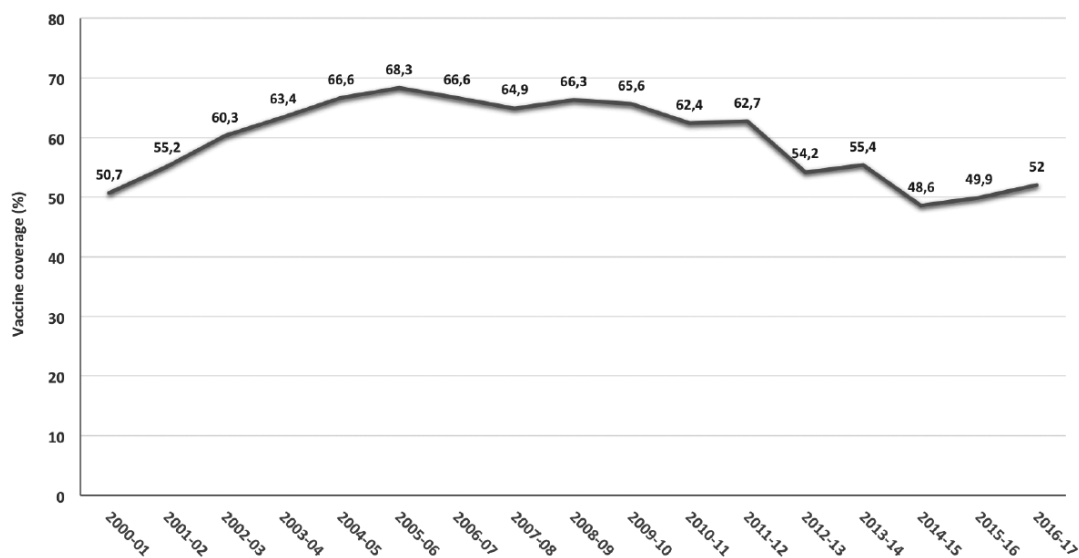


Figure 1 - Influenza vaccination in Italy: vaccine coverage (%) in elderly from 2000-01 to 2016-17 seasons.

the social costs associated with morbidity and mortality. These goals can be reached by expanding access to immunization services and extending vaccination campaigns to other target populations, such as subjects 50-65 years of age and children, on the basis of the most recent scientific evidence available (12). Moreover, an electronic database dedicated to influenza vaccination coverage in each Italian region should be created as soon as possible.

Which strategies can be implemented in order to increase coverage rates in the elderly?

The perceived low effectiveness of influenza vaccines and the fear of possible adverse events are the main obstacles to increasing vaccination coverage.

Measuring influenza immunization coverage every year is important in order to evaluate immunization programmes, to identify sub-populations with low

immunization coverage and to monitor progress towards Italian national immunization coverage goals. Collecting this information helps in planning immunization programmes for subsequent seasons.

In order to improve vaccination coverage in subjects aged ≥ 65 years, several interventions have been identified: (i) “tailor-made” information campaigns, (ii) health worker training on the epidemiological, clinical and economic impact of influenza and on the adoption of innovative communication strategies for the implementation of vaccination strategies, that take into account the needs of the elderly population; (iii) involving elderly people’s associations in awareness-raising activities; (iv) strengthening the role of general practitioners in promoting influenza vaccine; (v) raising awareness among general practitioners that they can contribute to the creation of regional lists on the basis of disease exemption codes, in order to create patient databases and directly alert patients to vaccination campaign (strategy

mainly targeted to the elderly with chronic conditions). These interventions were also indicated by the Ministry of Health for the 2017-2018 season (14). For individuals who are unable to get to a vaccination centre, home assistance coordinated by specialists can allow the vaccine to be administered directly at the patient's home or at residential institutions for long-term care facilities. Moreover, vaccination can be undertaken at the end of inpatient and outpatient visits. The international scientific literature has already described the benefits of vaccinating (elderly) patients during hospitalization, underlining that this strategy significantly increases the percentage of coverage in the subgroups at greatest risk (34, 35).

It should be noted that general practitioners have a fundamental role to play in promoting influenza vaccination among those involved in the care of elderly patients, including caregivers (family members, healthcare workers, volunteers, etc.). Indeed, it is well known that vaccinating subjects who are not directly at risk, but who are in frequent contact with elderly people enhances community immunity, thereby reducing the spread of the virus. (14, 36).

Conclusions

Influenza is a significant illness in terms of severity and complications. The treatment of influenza and its complications consumes considerable resources, which could otherwise be used for other essential healthcare services. In Italy, it has been estimated that the global costs attributable to influenza between 1999 and 2008 amounted to around €15 billion, about €1.5 billion for each influenza season (3).

Vaccination is an undoubtedly efficacious means of preventing influenza. It is well-recognized that, compared with non-vaccination, annual influenza immunization is cost-effective or even cost-saving in

different setting and population groups, including the elderly (37). A very recent cost-effectiveness analysis of different seasonal influenza vaccines in the elderly Italian population showed that aTIV had the most favourable economic profile and should be considered as a preferential choice for Italian subjects aged 65 years or above (38).

Finally, as the population ages, the demand for health resources is destined to increase. Therefore, in order to maximise the benefits of vaccination, it is necessary to plan and systematically implement influenza vaccination in target populations (the elderly) and to extend it to other age-groups (children aged 6-59 months of age and subjects 50-65 years).

Riassunto

Vaccinazione antinfluenzale negli anziani: tempo di rilancio

L'influenza può essere una malattia severa e costituisce una minaccia per la popolazione. Ogni anno, le epidemie influenzali stagionali colpiscono circa il 5-15% della popolazione mondiale. Alcune categorie fragili (come gli anziani) possono sviluppare complicanze, richiedere il ricovero in ospedale e possono andare incontro a morte. Al fine di ridurre il *burden* sanitario, sociale ed economico dell'influenza, la vaccinazione è raccomandata da molte autorità sanitarie in tutto il mondo.

L'Italia ha un programma nazionale di vaccinazione contro l'influenza che si rivolge a categorie specifiche, come i soggetti con condizioni croniche, le donne incinte, gli operatori sanitari e coloro che hanno più di 65 anni. Nonostante questa opportunità di prevenzione, la copertura vaccinale in Italia non raggiunge la soglia minima raccomandata del 75%.

Questo lavoro riporta alcuni interventi che possono migliorare i tassi di copertura della vaccinazione influenzale negli anziani, come ad esempio le campagne di informazione "su misura", la formazione degli operatori sanitari e l'adozione di strategie di comunicazione innovative al fine di implementare strategie di vaccinazione che tengano conto delle esigenze della popolazione anziana, il coinvolgimento delle associazioni degli anziani nelle attività di sensibilizzazione e il rafforzamento del ruolo dei medici di medicina generale nella promozione della vaccinazione antinfluenzale.

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