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Workplace vaccination against measles in a teaching hospital of Rome

Sir,

Measles is an acute, highly contagious infectious disease caused by a virus belonging to the Parvomyxoviridae family [1]. Two doses of measles vaccine (effectiveness 99%) are considered to provide long-lasting immunity even if antibody levels decline over time [2]. However, measles outbreaks continue to occur in countries with high vaccination coverage, suggesting an immune gap in the involved populations.

In 2017, Italy reported the second highest rate of measles infection among the European Countries (4,991). In particular, Lazio Region (the Region including Rome district) reported the highest number of cases (1,699) among Italian Regions. As far as the prevalence among healthcare workers (HCWs) is concerned, a total of 322 cases were reported in 18 out of 20 Italian Regions [3]. The epidemiological aspects of this outbreak can be explained by the low vaccination coverage recorded for measles, mumps and rubella (MMR).

A study performed in Italy from 1st January to 31st August 2017 showed that 22.3% of measles infection were detected in hospital settings and 6.6% of cases occurred in HCWs [4]. Other studies among HCWs demonstrated that 4—10% of all hospital workers lacked specific measles-specific Immunoglobulin G (IgG) antibodies [5]. In a previous study, we found non-protective measles-specific IgG antibody titres in a substantial percentage of HCWs, especially those younger than 35 years of age [6].

In order to avoid nosocomial measles outbreaks, we investigated the immunity status and vaccination attitude towards measles of HCWs at the teaching hospital Polyclinic Tor Vergata (PTV) of Rome. The same investigation was performed in students of the Medical Area of the University of Rome Tor Vergata, who carried out health surveillance at the Occupational Medicine ambulatory between 1st January and 31st December 2017. Measles-specific IgG antibodies were measured in serum by means of a chemiluminescent test (DiaSorin LIASON® Measles IgG assay). Subjects with measles-specific antibodies higher than 16.5 AU/mL were considered serologically immune. HCWs who documented a two-dose vaccination with MMR were considered protected, independently from their antibody titre, in accordance with the Centers for Disease Control and Prevention (CDC) guideline [1].

MMR vaccine was offered for free to all HCWs and students with measles-specific antibody serum value below than 16.5 AU/mL without a documented vaccination with two doses.

The aim of the study was to assess vaccine compliance and the effectiveness of workplace vaccination in reducing the risk of infection.

A total of 2,941 subjects (964 men and 1977 women) were included; 1772 (60.25%) were HCWs and 1,169 (39.75%) students of the Medical Area. The mean age of the general population was 32.89 years (standard deviation (SD) 10.8). According to age, we stratified included subjects in three groups: <35 years (77.30% serologically immune and 22.77% serologically not immune); between 35 and 55 years (97.19% serologically immune and 2.81% serologically not immune); >55 years (99.21% serologically immune and 0.79% serologically not immune). As a whole, 450/2,941 (15.30%) were serologically non-immune to measles; among these, 77 had been previously vaccinated with two doses of measles vaccine and therefore were considered immune to the disease even in the absence of protective titre. The vaccination campaign was addressed to the remaining 373 subjects.

A total of 178/373 (47.72%) subjects agreed to be vaccinated with MMR vaccine. Agreement was higher in the male gender (70/138, 50.72%) compared to the female gender (108/235, 45.96% $P < 0.05$).

Workplace vaccination proved effective in controlling infection among HCWs. In fact, despite the vaccination uptake being below 50%, the percentage of immune subjects reaching 90% coincided with no new cases of measles among HCWs (Figure 1).

We feel that the exact definition of the target of the vaccination campaign, provision of information about the risks of measles, and the ready availability of the vaccine minimized the expected 'vaccine hesitancy' [7].

HCWs below the age of 35 years showed the highest percentage of subjects susceptible to measles (15.30%). They represent the subjects born between 1982 and 1999 when the vaccination coverage against measles was inadequate [6]. All cases that occurred among the HCWs during 2017 (21 subjects) concerned the age group under 35 years. Therefore, this age group can be considered as the true high-risk group in our population.

In order to achieve the highest adherence to vaccination, we implemented, in collaboration with the Health Direction,

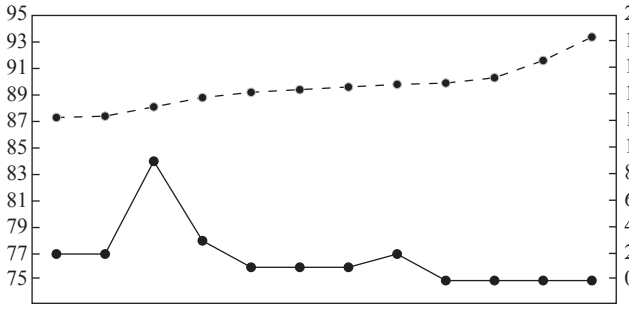

Figure 1. Occurence of measles cases in healthcare workers in relation to proportion of healthcare workers who were measles immune.

mandatory training interventions for HCWs, especially for those working in high-risk departments (e.g., paediatrics).

In our opinion, the Occupational Medicine services play a central role in informing the hospital employees about the importance of vaccinations, highlighting the risks to which unvaccinated workers are exposed, and at the same time the efficacy and safety of vaccines [8].

This study was approved by the Independent Ethics Committee of the University of Rome Tor Vergata (approval number 132/18).

Conflict of interest statement
All other authors declare no conflicts of interest.

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