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Original article

Vaccination coverage of adolescents: Results of a Defense and Citizenship Day-based survey

Couverture vaccinale chez les adolescents : résultats d'une enquête menée lors d'une Journée Défense et Citoyenneté

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Abstract

Introduction. – Vaccination coverage among French young adults is not routinely measured. Every French adolescent aged between 16 and 18 years must take part in the Defense and Citizenship Day (French acronym JDC). We aimed to assess vaccination coverage among young adults for hepatitis B, group C meningococcus meningitis, human papillomavirus (HPV), and measles. We also aimed to assess the proportion of adolescents who received the pertussis booster between the age of 11 and 13 years.

Methods. – The survey took place from January 19th to 26th, 2015 at the JDC center of Rennes, France. Vaccination coverage data was collected on site from the adolescents' health records. We collected the number of doses received and the dates of administration for each type of vaccine. A properly vaccinated adolescent was defined as having received the right number of doses according to the vaccination schedule.

Results. – A total of 467 adolescents attended the JDC Day: 408 (87.4%) had brought their health record or an equivalent document. Vaccination coverage was 92.6% [90.1–95.1] for measles, 34.6% [30–39.2] for group C meningococcus meningitis, 40.7% [35.9–45.5] for hepatitis B, and 30.1% [23.9–36.3] of girls had been vaccinated against HPV. Of all adolescents, 60.1% [55.7–64.9] received a dose of the pertussis vaccine between 11 and 13 years of age.

Conclusion. – Our results are similar to those of other data sources. With regard to the difficulty of assessing vaccination coverage in that age group, we believe recruitment bias was minimized due to our study location.

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Keywords: Vaccination coverage; Adolescents; Vaccination

Résumé

Introduction. – La mesure de la couverture vaccinale des jeunes adultes n'est pas réalisée en routine. La Journée Défense et Citoyenneté est obligatoire et cible les jeunes entre 16 et 18 ans. L'objectif de ce travail était d'estimer, dans cette tranche d'âge, la couverture vaccinale contre l'hépatite B, la méningite à méningocoque C, l'infection à Papillomavirus Humain (HPV), la rougeole et d'estimer la couverture du rappel coquelucheux entre 11 et 13 ans.

Matériel et méthode. – L'enquête s'est déroulée du 19 au 26 janvier 2015 au centre du service national de Rennes. Les données relatives à la couverture vaccinale ont été saisies sur place à partir des carnets de santé. Le nombre de doses et les dates d'administration ont été recueillis pour chaque vaccin. Une personne était correctement vaccinée si elle avait reçu le nombre de doses recommandé par le calendrier vaccinal.

Résultats. – Sur les 467 jeunes présents, 408 (87,4 %) avaient apporté leur carnet de santé ou un document équivalent. Les mesures de couverture vaccinale étaient de 92,6 % [90,1–95,1] pour la rougeole, 34,6 % [30,0–39,2] pour la méningite à méningocoque C, 40,7 % [35,9–45,5] pour l'hépatite B, 30,1 % [23,9–36,3] pour la coqueluche (11–13 ans) et 30,1 % [23,9–36,3] chez les filles pour le HPV.

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Conclusion. – Les résultats de notre enquête sont proches de ceux fournis par d'autres sources de données. Le lieu de recrutement a permis de minimiser les biais de sélection dans une tranche d'âge où il est difficile d'estimer la couverture vaccinale.

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Mots clés : Couverture vaccinale ; Adolescents ; Vaccination

1. Introduction

Vaccination is an effective means of protection against infectious diseases [1]. However, French vaccination coverage (VC) for some diseases is insufficient to effectively control or eradicate such diseases [2].

The public health goal is to reach or maintain (according to diseases) an optimal VC for age groups targeted for vaccination to indirectly induce herd immunity in the general population [3]. In 2013, we observed high and increasing VC for some infant vaccines such as diphtheria, tetanus, poliomyelitis (DTPolio) and pertussis as well as insufficient VC for hepatitis B among adolescents and for tetanus booster vaccine among adults [4]. VC for adolescents seems to be particularly low. The results of the 2012 Vaccinoscopie[®] study conducted on adolescents aged 14–16 years indicated that none of the vaccination coverage objectives set by the 2004 public health law had been reached by the end of 2012 [5,6].

The Defense and Citizenship Day (French acronym JDC) is mandatory for all French citizens aged 16–18 years living in France and abroad [7]. This day is well suited to conduct a study without any recruitment bias within this population age group.

Our primary aim was to evaluate VC among adolescents aged 16–18 years for hepatitis B, group C meningococcus meningitis, *Human papillomavirus* (HPV), and measles as well as VC for the pertussis booster vaccine received between the age of 11 and 13 years. We also aimed to confirm our results by comparing them with national and/or regional VC data published in the literature.

2. Materials and methods

2.1. What is the JDC Day?

Every French citizen must formally be identified via the national census. French citizens must comply with this requirement within three months of their 16th birthday or within a month of their naturalization for individuals aged 16–25 years. Once formally identified by the French authority each adolescent and young adult receives a notification for the JDC Day (45 days before the session day). Attending the JDC Day is compulsory. The date of the JDC Day is entirely random as it is based on the day the adolescent took part in the national census. Adolescents attending a given JDC Day are thus a representative sample of young individuals within a given administrative area.

2.2. Study period and population

We conducted this five-day study between January 19th and 26th, 2015 at the JDC center of Rennes with the authorization

of the French Ministry of Defense. Every candidate for the JDC Day living in the Ille-et-Vilaine department is affiliated to that specific center.

The Ministry of Defense sent a letter to each participant two weeks before the JDC Day asking them to bring their health record. Every adolescent summoned to attend the JDC Day during the study period was eligible for the study; we did not define any exclusion criteria for participation. Data related to VC was entered on site using the EpiData 3.1 software based on the information written in the vaccination section of the participants' health record (or any equivalent document). Data included the date of the JDC Day, the participant's year of birth, sex, department of residence, and vaccination coverage data (see below).

2.3. Defining the “up-to-date” vaccination status [8]

Data collected from the health records for each vaccine included the number of doses received, the date of administration, and the name of the vaccine (when indicated).

Measles vaccination was considered complete when the study participant had received two doses of the trivalent MMR vaccine or of the monovalent measles vaccine.

We considered participants up-to-date in their hepatitis B vaccination when they had received three doses of the vaccine or two injections at six-month interval, at least, between the age of 11–15 years if they had not previously been vaccinated. We considered that study participants had an incomplete vaccination status when they had received only one dose of the vaccine or two doses that did not respect the injection schedule mentioned above.

With regard to group C meningococcus vaccination, every adolescent who had received at least one dose of the conjugate vaccine from the age of one was considered vaccinated.

Every young girl who had received three doses of the quadrivalent (Gardasil[®]) or bivalent (Cervarix[®]) HPV vaccine with a minimum interval of four weeks between two injections was considered vaccinated.

We also recorded any measles vaccine injection received between the age of 11 and 13.

We measured hepatitis B and HPV VC with a minimum of four-week interval between injections (and with a minimum of 6 months for the 11–15-year vaccination schedule for hepatitis B).

We also presented the study to adolescents attending the JDC Day and gave them information on vaccination as a whole.

2.4. Statistical analyses

Data was analyzed with the Stata 12 software. VC for each vaccine was expressed as a percentage with the corresponding

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