Impact of the SARS-CoV-2 pandemic on the administration of vaccines as per the national immunization schedule in children younger than 2 years

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ABSTRACT

Introduction. The reduction in the number of visits to health care centers since the onset of the SARS-CoV-2 pandemic may affect mandatory vaccination.

Objective. To assess the impact of the SARS-CoV-2 pandemic on the administration of the pentavalent and the measles, mumps, and rubella (MMR) vaccines to children younger than 2 years at the vaccination center of a children's hospital in the Autonomous City of Buenos Aires.

Method. Cross-sectional study using the vaccination center's digital records from January to May 2019 and 2020.

Results. In the second fortnight of March 2020, vaccinations dropped by 64.2 %. When examining the first dose of the pentavalent and MMR vaccines, such reduction was 74.9 % and 55.1 %, respectively.

Conclusion. As of the second fortnight of March 2020, vaccinations dropped by 64.2 % compared to the same period of the previous year.

Key words: vaccines, pandemics, coronavirus infections, primary prevention, epidemiology.

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INTRODUCTION

In response to the pandemic caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), Argentina established a preventive and mandatory social isolation policy as of March 20th, 2020.¹ Its characteristics impacted society in different ways worldwide. Attendance to health care centers was affected and there were even fewer visits to the Emergency Department.² A series reported by Snapiri et al., showed that the diagnosis of appendicitis was delayed.³ Most likely, the same has occurred in relation to other aspects of child health.

Recently, it has been reported that the vaccination of children has also been affected by the pandemic. In England, McDonald found that the administration of the hexavalent and the measles, mumps, and rubella (MMR) vaccines dropped by 6.7 % and 19.8 %, respectively, when comparing the preventive isolation period to the same period of 2019.⁴ In the United States of America, Santoli et al., found similar results when reviewing two sources from the Centers for Disease Control and Prevention.⁵

Although it is reasonable to believe that a similar situation may have occurred in Argentina, no information has been compiled so far. Having data about failure to comply with the national immunization schedule is critical to take measures in that regard to prevent vaccine-preventable disease outbreaks.

OBJECTIVE

To assess the impact of the SARS-CoV-2 pandemic on the administration of the pentavalent and the MMR vaccines to children younger than 2 years at the vaccination center of a children's hospital in the Autonomous City of Buenos Aires.

METHOD

This was a cross-sectional study that used the digital records of the vaccination center at Hospital General de Niños Pedro de Elizalde. The sample included the records of vaccines administered to children younger than 2 years as per the national immunization schedule across two similar periods: January to May 2019 and 2020.

The total number of administered vaccines, the first dose of the pentavalent vaccine, and the first dose of the MMR vaccine (not corresponding to the schedule), per fortnight, in both periods were recorded, and the difference between the two was estimated and described as percentage. The pentavalent and MMR vaccines were chosen because they were considered to be indicators of access to the health system and, in addition, because there are historical data about their assessment in the same situation.⁴ The place of residence of vaccine recipients was also recorded to established if they lived in the hospital's jurisdiction (Autonomous City of Buenos Aires).

The analysis was done with the SPSS 20.0 software for Windows. The approval of the hospital's Research Ethics Committee was requested and obtained. All data were treated separately from any personal information.

RESULTS

In the January-May period, a total of 7263 vaccines were administered to children younger than 2 years in 2019, and 5407 in 2020. Comparing both years by fortnight, it was observed that the total number of vaccines administered was similar up to the second fortnight of March (isolation was established in Argentina as of March 20th, 2020); after this date, it dropped by

64.2 % (95 % confidence interval [CI]: 63.2-66.1) (*Figure 1*).

Something similar occurred with the administration of the first dose of the pentavalent vaccine (diphtheria, tetanus, pertussis [DTP], *Haemophilus influenzae* [Hib], and hepatitis B virus [HBV]) and of the MMR vaccine, which dropped by 74.9 % (95 % CI: 72.3-76.5) and 55.1 % (95 % CI: 48.2-61.4), respectively (*Figures 2 and 3*).

When assessing the place of residence of the vaccinated population, it was observed that, as of the second fortnight of March, the number of subjects who received a vaccine and were not living in the Autonomous City of Buenos Aires reduced by 81.1 % (95 % CI: 79.7-82.5) between 2019 and 2020, whereas the reduction among those living in the Autonomous City of Buenos Aires was only by 24.7 % (95 % CI: 22.4-27.1).

DISCUSSION

In our study, the number of vaccines administered as per the national immunization schedule dropped as of the initiation of the preventive and mandatory social isolation policy established due to the coronavirus disease 2019 (COVID-19) pandemic. These data were consistent with those reported by Santoli et al., who observed a reduction of at least 50 % in vaccine administration in the weeks following the declaration of a state of emergency because of COVID-19 in the United States.⁵ Bramer et al., also found that immunization coverage was smaller in 2020 compared to the same period in 2016-2019, except for neonatal vaccines, which are usually





administered at the maternity center.6

The analysis of behavior of the first dose of the pentavalent vaccine in our population showed a more marked and sustained decrease than that reported by McDonald in England.⁴ This may be related to the characteristics of the population that usually attends our hospital, mostly non-residents of the Autonomous City of Buenos Aires and who were not able to use public transportation due to the existing restrictions.⁷ Such assumption is reinforced by the fact that attendance to the Emergency Department of our hospital also decreased during in the same period.⁸

In addition, it should be noted that the pandemic made people afraid of attending health care facilities. In a survey conducted by the World Health Organization-United Nations International Children's Emergency Fund (WHO-UNICEF) in June of 2020 about the causes for missing a vaccine, parents' unwillingness

FIGURE 2. Variation in the pentavalent vaccine administered by fortnight. 2019-2020 period



FIGURE 3. Variation in the MMR vaccine administered by fortnight. 2019-2020 period



to attend vaccination centers due to fear of exposure to COVID-19 was the most common reason, whereas one-third of survey respondents mentioned other problems, such as limited public transportation and physical distancing policies.⁹ It should also be noted that isolation in Argentina lasted considerably longer and was stricter than in other countries.¹⁰

Faced with such barriers, it is worth mentioning that Argentina declared vaccination an essential activity during the preventive and mandatory social isolation.¹ In this regard, in our hospital, although changes were made in relation to patient admission (triage and emergency fever unit), the vaccination center operation was not affected at all (days, hours, access).

A potential limitation to be taken into account is that these data reflect the specific situation of a single facility. However, our hospital is a referral children's hospital with 500 000 consultations and more than 50 000 vaccines administered every year.

The potential impact of the pandemic and the preventive and mandatory social isolation on children has not been fully elucidated yet. However, the data about vaccine administration are worrying. Having this information is critical to take the corresponding measures so as to prevent the risk of vaccine-preventable disease outbreaks.

CONCLUSION

Since the establishment of the preventive and mandatory social isolation policy, vaccinations dropped by 64.2 % compared to the same period of the previous year. ■

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