Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Scientific letter

Influence of positive SARS-CoV-2 CRP on hospital admissions for COVID-19 in a Spanish health area☆

Influencia de PCR SARS-CoV-2 positivas en los ingresos hospitalarios por COVID-19 en un área de salud española

Dear Editor:

The 2019 coronavirus disease (COVID-19) has become a significant health and social challenge. Ever since it was declared a pandemic, the number of people infected by its causing virus, the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), and deceased as a result of the disease has increased steadily. We are currently in the midst of a second wave of the epidemic, which is characterized by a significant increase in Emergency Room visits and hospital admissions, where it is not only necessary to meet the healthcare demand caused by COVID-19, but also to continue to provide care for patients with other pathological processes not related to SARS-CoV-2.

The polymerase chain reaction (PCR)–based molecular detection technique continues to be the most widely used diagnostic method for classifying a person as infected by the virus.[1] In addition, this technique is also very useful for monitoring the evolution of the pandemic.[2] However, we have not found any article evaluating the number of hospital admissions based on the rate of newly infected individuals. The main objective of this study is to determine whether there is an association between the percentage of individuals with a positive PCR test within a given population and the number of hospital admissions due to a SARS-CoV-2 infection, as well as to analyze the delayed influence over the following ten days.

To this end, a temporal analysis of the total number of PCR tests performed between 15 May 2020 and 1 November 2020 compared with the known number of SARS-CoV-2 infections was carried out. For this purpose, the daily percentage of new positive PCR tests and that of admissions from the Emergency Room due to a diagnosis of SARS-CoV-2 infection were taken into consideration.

A generalized linear regression model with a Poisson distribution was used to analyze the correlation between both variables, adjusting it based on the daily number of emergencies attended. To evaluate the possible delayed influence of the percentage of positive PCR tests, their percentages were analyzed in relation to the admissions that took place on the same day and up to ten days later (delay of 0 to 10 days). In addition, the relative risk (RR) of the number of daily admissions was calculated per every 1% or 5% daily increase in new positive PCR tests. The impact of this percentage on the number of daily admissions was quantified by calculating the attributable fraction (AF). Akaike's information criterion was used to select the optimal model. A confidence level of 95% was deemed significant in all cases ($p < 0.05$).

A total of 81 497 PCR tests were performed during the study period, with 7 849 (9.63%) of them corresponding to new positives. The total number of emergencies attended throughout this period was 35 970, with a total of 6 726 resulting in hospital admissions. The daily mean number of admissions of patients with a SARS-CoV-2 infection was 4.71 (standard deviation [SD:] 6.33). The percentage of positive tests evolved unevenly as of epidemiological week 34, reaching a positivity rate of 18.17% at week 44, with a 39.84% increase in the number of hospital admissions at this point.

Table 1
Attributable fraction and relative risk of admission due to COVID-19 per every 1% and 5% increase in the number of new positive PCR tests and daily delay.

Delay in days	RR per every 1% increase (95% CI)	AF per every 1% increase	RR per every 5% increase (95% CI)	AF per every 5%
No delay	1.124 (1.104–1.145)	11.03	1.797 (1.637–1.971)	44.35
1-day delay	1.124 (1.105–1.143)	11.03	1.776 (1.633–1.931)	43.69
2-day delay	1.127 (1.109–1.145)	11.27	1.817 (1.681–1.965)	44.96
3-day delay	1.118 (1.097–1.139)	10.55	1.746 (1.592–1.916)	42.72
4-day delay	1.121 (1.102–1.140)	10.79	1.772 (1.627–1.929)	43.56
5-day delay	1.122 (1.099–1.145)	10.87	1.778 (1.606–1.968)	43.75
6-day delay	1.126 (1.104–1.148)	11.19	1.809 (1.641–1.993)	44.72
7-day delay	1.121 (1.100–1.142)	10.79	1.770 (1.612–1.944)	43.50
8-day delay	1.120 (1.098–1.141)	10.71	1.760 (1.599–1.938)	43.18
9-day delay	1.120 (1.101–1.140)	10.71	1.766 (1.618–1.927)	43.37
10-day delay	1.118 (1.096–1.141)	10.55	1.749 (1.584–1.931)	42.82

%: percentage; AF: attributable fraction; CI: confidence interval; RR: relative risk.

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A significant association was detected between the number of daily admissions and the percentage of new daily positives ($p < 0.001$). This association was maintained throughout the ten days during which these variables were analyzed, although it was greater on the second and third days (Table 1).

Our study confirms the existence of an association between the percentage of positive PCR tests obtained and the number of daily hospital admissions due to a SARS-CoV-2 infection. The greatest impact was observed on the second day, when the percentage of admissions reached 44.9% per every 5% increase in the number of positive tests. It has been suggested that epidemic curves of positive cases do not always accurately reflect the epidemic growth rate, as the performance rates of this technique may be influenced by its diagnostic capacity.[3] In this sense, given that the number of hospital admissions is less affected and can better reflect the epidemiological situation, we have considered it to be a superior metric.[4,5] The ability to estimate the likelihood of hospital admissions based on the percentage of positive PCR tests can aid in managing hospital resources more efficiently within the context of the pandemic.

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Chemical sensitivity in children[☆]

Sensibilidad química en la infancia

Dear Editor,

Adverse drug reactions are common and more important than what is generally believed. In contrast, adverse reactions associated with the chemical compounds present in inhaled drugs, which can be considered episodes of chemical sensitivity, are not as frequent. In this paper we describe two cases of adverse reactions to chemical compounds that highlight this association.

The first case corresponds to a 12-year-old girl under treatment with salmeterol/fluticasone 25/250 μg and salbutamol when needed (PRN), both administered through a metered dose inhaler (MDI).

Within a period of less than four months, the patient experienced three episodes of dizziness, nausea, vomiting, headache, unsteadiness, mental dullness, bradypsychia, blurred vision, generalized weakness, irritability, sadness, increased weeping, speech difficulties, palpitations, blurred vision, and paresthesias in her feet and hands. After performing multiple tests that yielded normal results, and given her inexplicable symptoms, a possible adverse reaction to her inhaled medication was suspected. After discontinuing the MDI inhalers and replacing them with Turbuhaler® devices, her symptoms resolved completely, and she has remained asymptomatic for the past two years.

The second case corresponds to a six-year-old boy under treatment with salmeterol/fluticasone 25/250 μg and salbutamol, both also administered through MDI devices. For the last year he has exhibited behavioral disorders, irritability, increased weeping, restless sleep, impaired school performance, a poor relationship with his classmates, sudden mood swings, and "tantrums". Over the past three months he has experienced two episodes of dizziness, generalized malaise, headache, pallor, unsteadiness, blurred vision, and palpitations. After performing tests and obtaining normal results in all of them, all of his medication administered through an MDI inhaler was replaced with Turbuhaler® devices. Following this change, he experienced a complete resolution of his symptoms and has remained asymptomatic for the past ten months.

Following the resolution of both cases, we investigated the involvement of the MDI inhalers in the onset of the patients' symptoms and found that propellant gas norflurane is found in all commercially available MDI inhalers.[1]

In 1997, the Kyoto Protocol[2] mandated the replacement of chlorofluorocarbon propellants with ozone-friendly propellants

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