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COVID and CARE[®]. Mobile application for monitoring SARS-CoV-2 positive patients after hospitalization



COVID and CARE[®]. Aplicación móvil para el seguimiento tras hospitalización de pacientes SARS-CoV-2 positivo

Dear Editor,

Due to the current health scenario marked by the SARS-CoV-2 pandemic, the number of people who have required hospital admission in our country amounts to more than 124,000 patients as of 7th of June 2020.¹ Health systems must articulate their resources in an efficient way to improve the continuity of the inter-level assistance, avoiding the risk of under-medical care due to lack of coordination among them.

Currently, post-discharge follow-up of these SARS-CoV-2 patients is usually done by regular telephone consultation. Therefore, there is no continuous, daily monitoring system that allows us to detect early warning symptoms of poor clinical evolution.

The widespread use of smartphones among the population brings with it a growing range of mobile health applications with very different objectives.² The level of confidence that such applications deserve is widely debated; however, the role they can play in the increasingly near future is undisputed because of their speed, convenience, ease of use and the connectivity they provide.³

The development of COVID and CARE[®] application arises from the need to provide a continuous and quality home monitoring

system to all outpatients discharged after having been hospitalized for SARS-CoV-2. It will allow us to provide a non-presential surveillance system in a period of increased vulnerability and clinical risk through a personalized remote monitoring.

COVID and CARE[®] is an easily access mobile application based on voluntary participation. After informing the consent, patients will be able to install it in their mobile phones from the first day of the hospital discharge. It has an intuitive and suitable interface for any type of user – including the patient himself or a family representative. The user will be provided with a registration number and a password in order to access and make the initial registration in the application.

In this first access, patients will login with a short questionnaire about age, sex, ICU stay, family support and availability of pulseoximeter at home ('yes or not' in three last). The user will send twice a day an updated report of his clinical status. An alert will be generated in the device as a reminder in the enabled schedules, displaying a short survey of 5 questions about the clinical situation with default answers (Fig. 1): 'how are you today?', 'do you feel shortness of breath?', 'do you have persistent cough?', 'temperature' and 'SatO2' (just appears if patient answer availability of pulseoximeter).

Each response has been assigned a numerical value according to severity criteria. Scores has been associated by physicians, trying to simulate the importance they give to these answers during a clinical interview in their medical experience, scoring higher objective signs that subjective symptoms, and according with recommendations given by Servicio Andaluz de Salud on telephone monitoring.⁴

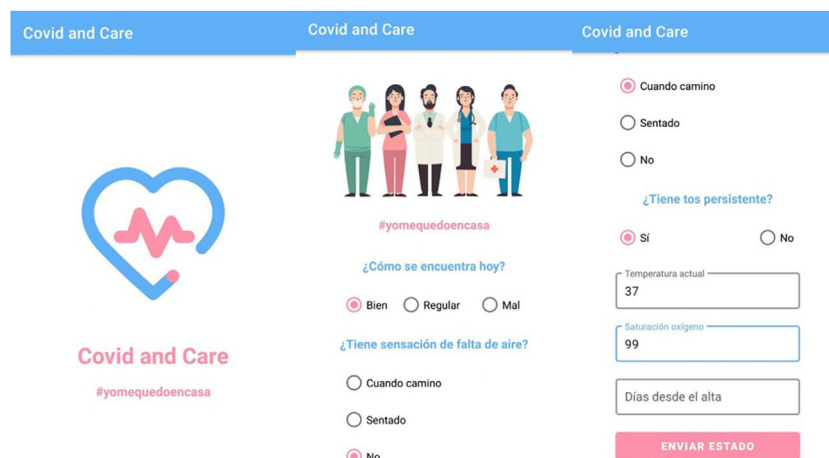


Fig. 1. Screenshots of the app.

The sum of points obtained on the day will reflect the patient's vulnerability; the higher the score, the greater the severity or the risk. The application will automatically order all the records, creating a list set up according to the score reflected, from highest to lowest, which will allow the physician to discern those patients who require earlier and closer attention and to prioritize their care. This will allow to optimize, but not replace, the work of the physician, who will check results daily (including answers received, not just the final score) and will contact with those patients need it by his medical criteria.

The preliminary version of the application has already begun to be used and is being well received. Patients use to report their clinical status during two–three weeks after hospitalization, according with suggestions provided by posthospitalization follow-up physicians. This telematic service has received a positive feedback from the users, improving the satisfaction perceived in the outpatient follow-up.

In the future, COVID and CARE® could serve as a model for its extension to other hospital centres and/or lay the foundations for the development of new mobile applications for mass telematic monitoring of other pathologies.

Authors' contributions

Cristina Gómez Rebollo: Intellectual development of the application and main coordinator of the project, preparation of the manuscript.

Estefanía Mira Padilla: Intellectual development of the application, preparation of the manuscript.

Francisco Santos Luna: Use of application for patient monitoring, critical review of the manuscript.

José Manuel Vaquero Barrios: Critical review of the manuscript with important intellectual contributions.

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Conflict of interest

The authors declare that they have no conflict of interest directly or indirectly related to the contents of the manuscript.

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SARS-CoV-2 infection as trigger multisystem inflammatory syndrome?[☆]



¿Infección por SARS-CoV-2 como desencadenante de un síndrome inflamatorio sistémico?

SARS-CoV-2 infection in children has generally presented as asymptomatic or with mild catarrhal signs and symptoms.^{1,2} Since last April, a set of cases of children with systemic inflammatory response syndrome have been reported. These children had symptoms reminiscent of Kawasaki disease or toxic shock syndrome, but with distinctive characteristics, such as abdominal pain and gastrointestinal disorders. Some of these children presented myocardial involvement and haemodynamic shock. Since then, this syndrome has been known by different names. As of May, it is known as paediatric inflammatory multisystem syndrome temporally associated with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) (PIMS-TS).^{3–5}

We report the case of a four-year-old boy with systemic inflammatory response syndrome, with positive results for IgG for SARS-CoV-2 and negative results for IgM and polymerase chain reaction (PCR) on a nasopharyngeal swab sample.

No personal history of note was reported, and the boy had an up-to-date vaccination schedule.

He was evaluated by his paediatrician due to recent onset of fever, erythema and oedema in his hands and feet. The clinical picture was interpreted as a viral infection, and symptomatic measures were recommended. On the third day, he went to the emergency department of a secondary hospital due to persistent high fever, impaired general condition, severe muscle pain, a polymorphous rash with central progression, eyelid oedema and non-suppurative bilateral conjunctival hyperaemia, strawberry tongue and erythematous lips (Fig. 1), in addition to associated diarrhoea and colicky abdominal pain. He did not present lymphadenopathy, catarrhal symptoms or respiratory distress. Upon admission, he presented tachycardia (136 bpm), blood pressure at the lower limit of normal (88/41 mmHg, p 24/14) and normal oxygen saturation. Blood testing showed neutrophilia with a normal leukocyte count, normocytic and normochromic anaemia, normal platelets, coagulopathy with prolonged PT and APTT (1.57 and 1.28, respectively), elevated C-reactive protein (22 mg/dl), hypoproteinaemia,

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