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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 avilability of pulsioximeter 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 avilability of pulsioximeter).

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]

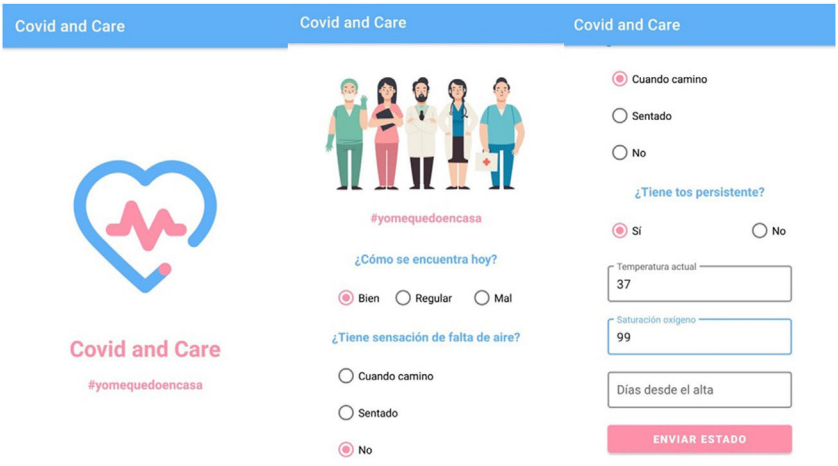

Fig. 1. Screenshots of the app.

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

SARS-CoV-2 infection as trigger multisystem inflammatory syndrome?

La infección por SARS-CoV-2 en la edad pediátrica se ha presentado generalmente como un cuadro asintomático o con clínica catarral leve[1,2]. Desde el pasado mes de abril se han descrito un conjunto de casos de niños con síndrome de respuesta inflamatoria sistémica con una clínica que recuerda a la enfermedad de Kawasaki o al síndrome del *shock* tóxico, pero con unas características distintivas como son dolor abdominal y trastornos gastrointestinales, presentando algunos casos afectación miocárdica y *shock* hemodinámico. Desde entonces, este síndrome se ha conocido con diferentes nomenclaturas y, desde mayo, se conoce como *Paediatric inflammatory multisystem syndrome temporally associated with severe acute respiratory syndrome coronavirus 2* (SARS-CoV-2) (PIMS-TS)[3–5].

Presentamos el caso de un niño de 4 años con síndrome de respuesta inflamatoria sistémica e IgG positiva para SARS-CoV-2 con IgM y reacción en cadena de la polimerasa (PCR) sobre muestra de frotis nasofaríngeo negativas.

No referían antecedentes personales de interés y tenía el calendario vacunal actualizado.

Fue valorado por su pediatra por cuadro de fiebre, eritema y edema en manos y pies de reciente comienzo que se interpretó como infección viral, recomendándose medidas sintomáticas. Al tercer día acudieron a urgencias de un hospital de segundo nivel por persistencia de fiebre alta, afectación del estado general, mialgias intensas, exantema polimorfo con progresión central, edema palpebral e hiperemia conjuntival bilateral no supurativa, lengua aframbuesada y labios eritematosos (fig. 1), además de estar asociado a diarrea y dolor abdominal tipo cólico. No mostraba adenopatías, cuadro catarral ni dificultad respiratoria. A su ingreso presentaba taquicardia (136 lpm), tensión arterial en el límite bajo de la normalidad (88/41 mmHg, p24/14) y saturación de oxígeno normal. Se realizó analítica sanguínea donde presentaba neutrofilia con recuento leucocitario normal, anemia normocítica y normocrómica, plaquetas normales, coagulopatía con TP y TTPA alargados (1,57 y 1,28, respectivamente), proteína C reactiva elevada (22 mg/dl), hipoproteinemia e hipoalbuminemia (5,8 y 2,9 g/dl, respectivamente), con resto de la bioquímica normal, incluida ferritina y transaminasas. Se inició antibioter-