CONFERENCE ABSTRACT

Automatic Support for Improving Management and Treatment of Patients with Obtrusive Sleep Apnea Syndrome

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Xavier Rafael-Palou[1], Cecilia Turino[2], Alexander Steblin[1], Alejandro Lopera[3], Ferran Peña[3], Ana Mayoral[3], Manuel Sánchez-de-la-Torre[2], Ferran Barbe[2], Jordi Blanco[3], Eloisa Vargiu[1]

1: Eurecat Technology Center - eHealth Unit, Spain;
2: Hospital Universitari Arnau de Vilanova - Lleida, Spain;
3: Oxigen salud, S.A., Spain

Background: In the context of innovation in telemedicine, the myOSA project is aimed at developing new ICT tools and remote clinical follow-up methods to allow the creation of continuous integrated services for the treatment of Obstructive Sleep Apnea (OSA).

Currently in Spain, after a visit with a pulmonologist, patients suffering from severe OSA are treated with a continuous positive airway pressure (CPAP) machine at their home. Pulmonologists and CPAP providers guide patients on how to use the device properly and prescribe them to use the machine at least 4 hours daily in order to benefit the therapy. From that moment on, the medical protocol states the following visits after 1, 3, 6 and 12 months and then once a year. In so doing, it may happen that, during a visit, pulmonologist discovers that the patient is using the CPAP less than 4 hours or s/he is not using it at all.

Methods: To improve patients' compliance and achieve better follow-up, we developed a system that, connecting the CPAP with Internet and providing patients with an app in their smartphone, gives support to both patients and pulmonologists. At her/his home the patient has the CPAP machine connected to Internet and a smartphone with the app. At the hospital, pulmonologists are provided with a web-application that summarizes relevant information and gives also a support in medical decisions. Finally, the MyOSA platform, installed in the cloud, connects all the devices for data exchanging. The core of the MyOSA platform is the Intelligent Monitoring System that is composed of a set of intelligent algorithms aimed at predicting the expected adherence level to the therapy by a given patient. To provide a support to pulmonologists for patients' follow-up, three predictions models have been built: at day 1, at month 1, and at month 3. All predictions regard compliance at month 6. To provide personalized recommendations to patients according to their adherence, clustering has been used to identify similar users

Results: The trials just started and a total of 60 patients will participate in the study. Once a patient enters the program, s/he is provided with a CPAP to be used at home and an app to be installed in her/his smartphone. Once a day, the CPAP sends data to the cloud where they are stored and analyzed to identify the level of adherence the patient belongs to. Depending on the predicted adherence, different recommendations are sent. Three kinds of recommendations have been identified: awards, feedback, and alerts. At the same time, a prediction of how patients will follow the therapy is given to pulmonologists through a web-application.

Conclusions: The goal of myOSA is to provide patients' empowerment in using CPAP and improve their follow-up by pulmonologists. Clinical trials just started. In the near future we will improve the system by relying with more data and getting direct feedback from patients. We will also work together with pulmonologists to improve and extend the set of recommendations.