Telemedicine for Patients with Chronic Disease or for Elderly Patients: An Opportunity for the Family Doctor!

Andrès E1,2*, Talha S2,3, Hajjam M4, and Hajjam5

1Service de Médecine interne, Diabète et Maladies métaboliques de la clinique médicale B, Hôpitaux Universitaires de Strasbourg, France
2Faculté de Médecine de Strasbourg, Université de Strasbourg (UdS), France
3Service de Physiologie et d’Explorations fonctionnelles, Hôpitaux Universitaires de Strasbourg, France
4PREDIMED Technology, France
5Equipe de recherche EA 4662 “Nanomédecine, Imagerie, Thérapeutiques”, Université de Technologie de Belfort-Montbéliard (UTBM), France

Editorial

The rising prevalence of chronic diseases like chronic heart failure, diabetes mellitus, and chronic obstructive pulmonary diseases, combined with population aging now represents a very real problem for public health [1]. The cost of these chronic diseases has rocketed, and is estimated at several billion dollars in developed countries. What’s more, these patients are often elderly and have one or more chronic diseases, and their management is a challenge for healthcare professionals, especially for the Family Doctor. Their needs eat up large amounts of medical resources, just as a shortage in the time careers can provide is beginning to be felt, with medical deserts and a lack of access to healthcare professionals, among other problems. Thus, the Family Doctor must find new tools to optimize his medical time and facilitate his job!

In fact, most chronic pathologies remain serious diseases in terms of their functional or survival prognosis, and morbidity and mortality are high [1]. This applies particularly well to heart failure, in which the mortality rate of patients with stage III–IV disease according to the New York Heart Association (NYHA) classification is at least currently around 30% at 5 years in more recent studies. Patients with chronic diseases, e.g. chronic heart failure, frequently present for emergency hospitalization and re-hospitalization, which impairs the quality of their life. Some of these hospitalizations could be avoided if patients took greater responsibility for their disease and were followed up better. This last point has been particularly well documented in heart failure and diabetes. Telemedicine may be of aid in this setting. Indeed it may even optimize the management of such chronic diseases, particularly by preventing emergency and repeat hospitalizations [2]. It may also make it possible to structure integrated care pathways.
Since the beginning of the 2000's, numerous telemedicine projects have been conceived and developed in the area of chronic diseases, especially in chronic heart failure [3-21]. Practically all of them have investigated telemonitoring (or tele management, as it is also known). The results of those telemedicine projects differed from study to study and were fairly inconclusive regarding any potential clinical benefit in terms of, for instance, re-hospitalization or a decrease in morbidity and mortality. Nevertheless, several reviews and meta-analyses seem to have shown an undeniable utility for telemedicine. Moreover, aside from the medical considerations, it is worth noting that all the studies seem to agree that using telemedicine solutions in the management in case of heart failure was at least economically beneficial. It is worth bearing in mind that those projects, particularly the earlier ones, more closely resembled telephone follow-up with care providers (such as a nurse) traveling to the patient’s home, rather than telemedicine as we think of it nowadays with nonintrusive, automated, smart telemonitoring using remote sensors via modern communication technology or even artificial intelligence [18]. Hence in our opinion those studies represent the first generation of telemedicine projects: "telemedicine 1.0" [18]. It should also be noted that none of these projects are really interested in the role of Family physicians. Most of these projects were managed by hospital teams and not by the professionals usually in charge of the patient.

Over the last 4 to 5 years, a second generation of projects has emerged in the chronic diseases area, e.g. in the heart failure area, particularly in developed countries as in France [18]. These projects are known as "telemedicine 2.0", because they utilize the new Information and Communication Technology (ICT) and the web. Most of these projects rely on the usual connected tools for monitoring chronic diseases, as such as blood pressure meters, weighing scales, and pulse oximeters in heart failure, or glucometers in diabetes mellitus., which relay the information collected via Bluetooth, 3G or 4G and incorporate tools for interaction between the patient and healthcare professionals like telephone support centers, tablets, and websites [18]. Some of them also provide tools for motivation and education, and occasionally, questionnaires about symptoms, such as dyspnea, palpitation and edema as experienced by the patient. We have developed in Strasbourg such of "telemedicine 2.0" project, centered on the patient’s nurse and Family Doctor.

The E-care has been developed to optimize the home-monitoring of heart failure patients. It detects situations in which there is a risk of cardiac de compensation and re-hospitalization, and it does this via a telemonitoring 2.0 platform [22, 23]. The E-care platform generates indicators of a worsening of the patient’s health status. These "warning alerts” are generated for any heart failure decompensation that may lead to hospitalization if not treated. Between February 2014 and April 2015, 175 patients were included in this project [24]. During this period, the E-care platform was used on a daily basis by patients and healthcare professionals according to a defined protocol of use specific to each patient. The mean age of these patients was 72 years and the ratio of men to women was 0.7. The patients suffered from multiple concomitant diseases and had a mean Charlson index of 4.1. During the study, 1,500 measurements were taken in these 175 patients, which resulted in the E-care system generating 700 alerts in 68 patients. Retrospective analysis of the "warning alerts” showed that the E-care platform automatically and non-intrusively detected any worsening of the patient’s health, particularly cardiac decompensation. Indeed, it was in this last setting that the system yielded the best sensitivity, specificity, and positive and negative predictive values, respectively 100%, 72%, 90% and 100%. Both the healthcare professionals and all the patients, even the frailest, used the E-care system without difficulty until the end of the study. During the study of non-autonomous patients, the system was employed by a nurse in addition to other tasks like washing and administering medication, as well as by close ones and Family members. Hence, it has been our experience that age is not a limiting factor on grasping and using new technologies. Several recent studies have reached the same conclusion, documenting the use of telemedicine solutions even among 80-year-olds [25]. In the present experience, "warning alerts” have preceded cardiac decompensation for up to 5 days. In the future, this time may be used by the Family Doctor to the therapy.

In our experience, the telemedicine platform is also capable of structuring the patients’ care pathways, a major theme in medicine for our governments and authorities; it is also capable of providing a means for the various healthcare professionals to exchange with each other; and of facilitating access to medical resources. With this in mind, an enhanced version of the E-care platform will be experimented in the homes of heart failure patients as part of a project called PRADO INCADO. PRADO is a French program to support patients returning home after hospital, while PRADO INCADO will specifically target heart failure patients in this setting with the support of the E-care platform. This project is support by a prospective comparative
Besides heart failure, the opportunities in geriatrics revolve around developing new versions of E-care to enable "global" 2.0 telemonitoring of elderly subjects or subjects with several chronic diseases in nursing homes or at home, as opposed to single-disease telemonitoring as currently offered by a large number of telemedicine projects and solutions [18]. As with E-care, the "telemedicine 2.0" projects are perfectly compatible with the care pathways being developed in chronic diseases by the developed countries health authorities. What's more, all these findings should be analyzed with regard to the benefit of these telemedicine solutions. This experience may lead us to witness the birth of the medicine of tomorrow! In the field of chronic diseases, given the epidemiology and expected shortage of time careers can provide, what we need is better follow-up and better education, improved prevention and anticipation, but, above all, better selection of the patients whose use of the healthcare system will be indispensable. In the future, it is crucial to develop new tools and practices for Family Doctors.

Conflicts of Interest

The authors state that they have no conflicts of interest to declare except Mr M. Hajjam, who is the science director of the company PREDIMED Technology.

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