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OPINION ARTICLE

Reflections on the Future and Usefulness of Teledermatology

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During the past 15 years, the incorporation of new applications into the field of medicine has been made possible by advances in information and communication technologies, and this has generated new needs and a corresponding demand for the new services. It is important to recognize that, for better or for worse, telemedicine is one of the applications that has followed this trend. Telemedicine only began to be seen as a useful healthcare tool when information and communication systems became sufficiently powerful to handle the applications and the cost fell into a more accessible range. Once this occurred, the technology started to come into more general use. Although the real cost of such systems is still unclear, teledermatology has emerged as a relatively simple and low-risk method for delivering dermatologic care, making it a promising option for professionals eager to embrace innovation. At a time when healthcare policies are having considerable media impact, telemedicine systems are being rapidly deployed despite the lack of appropriate mechanisms for evaluating their effectiveness and the consequent lack of scientific evidence to support their usefulness.

The following comments are a few reflections on the current situation of teledermatology in Spain touching on the less technical—more peripheral if you prefer—aspects of the excellent review in this subject published by Guillermo Romero and his colleagues in this issue.[1,2]

How Might Teledermatology be Useful?

The primary aim of teledermatology in the context of Spanish healthcare has, since the outset, been to reduce the inequities in the national health system. It is thought that telemedicine will facilitate patient access to healthcare resources (in particular specialized medicine), a view generally accepted with few reservations in the context of special situations (island communities, institutional settings, and remote areas). Teledermatology could also be a useful tool for triage, that is, for selecting the most serious cases or the most suitable candidates for hospital treatment, and expediting healthcare in such cases. Other results of the application of these technologies are reductions in waiting lists and the number of avoidable referrals from primary care, and enhanced continuity in healthcare. We must also bear in mind that the ultimate goal of any quality healthcare system is to optimize patient care and outcomes and to make every possible effort to improve the health of the population in general.

Two other desirable objectives of teledermatology are to remedy the inefficiencies of a healthcare system compartmentalized into various levels of care and to promote medical education and continuing in-service training. These objectives depend more on the flexibility of the professionals involved and their acceptance of the technology than on the technology itself.

What Have Studies on Teledermatology Demonstrated?

Research on the use of teledermatology has often been methodologically flawed, and the results in terms of efficacy are inconsistent (due to differences in experimental design, sample size, and the modality studied). However, we can confirm at this stage that the 2 types of platforms used to deliver teledermatologic care—synchronous or real-time systems and asynchronous or store-and-forward systems—both offer acceptable levels of diagnostic reliability (interobserver and intraobserver) and system validity (albeit with some incongruent and hard-to-interpret findings, such as the superiority of asynchronous systems over conventional consultation for pigmentary lesions). Although the hybrid systems offering both modalities appear to offer little more than the combined disadvantages of both real-time and asynchronous systems, it is precisely these platforms that have been implemented in some of the Spanish autonomous communities.

Moreover, as the variables that affect reliability and validity have been identified (basically the quality of the images and the medical history recorded at the referral site), we can always strive to optimize these variables and improve results. The American Association of Teledermatology has recently published guidelines that include standards, recommendations, and additional optional steps that should be taken to optimize both the technical specifications for teledermatology (the acquisition, storage, retrieval, and transmission of images) and clinical practice in this field.[3]

Clearly, further studies are needed to assess the efficiency of this technology applied to dermatology. The scant available data indicate that teledermatology may be cost-effective in certain circumstances, such as the treatment of patients in rural areas

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(using isochronal mapping techniques)[4] and the selection of skin cancer patients suitable for surgical treatment.[5] Although most costs analyses have so far studied real-time interactive teledermatology, there is a clear trend towards the use of store-and-forward systems in clinical practice because the asynchronous model offers greater flexibility in the use of available resources.

I should stress that the cost-benefit and cost-effectiveness studies undertaken to date have systematically failed to take into account the cost of investment in technology (terminals, cameras, and networks), the physical and structural overheads, and expenditure on the technical, healthcare, and medical personnel involved. Some authors argue that the investment in technology for other purposes can be used to implement new teledermatology systems, but this is not always the case, and, even if it were, this initial expenditure cannot be omitted from costs analyses. So, do we really know what teledermatology costs? Finding the real answer to this question would also entail a careful evaluation of the opportunity cost of teledermatology, that is, the benefit lost when available resources, which are always limited, are diverted to meet the needs of this new activity. We must bear in mind that investment in human resources is currently quite limited, and that most of the teledermatologic activity in Spain is carried out in practice by the same—or almost the same—healthcare personnel who provide conventional care.

The data security standards (secure storage and confidentiality) are assumed to be those that apply to any information stored on highly secure digital media (which is the level of security required by law for healthcare data stored on any media), and these considerations form an integral part of the technical specifications of any tool intended for such use. Finally, as Guillermo Romero points out, there are no good reasons to suppose that ethical considerations or the provider's legal responsibility to patients should differ from those that already apply to conventional healthcare. Moreover, some specialists in medical law argue that the aspect of teledermatology that could have legal implications in the future might be failure to use such technology when it is available and a demand already exists. Such a situation could be deemed to entail the same sort of responsibility as a denial of resources or care. However, we should ask ourselves whether this would really be the case.

What is the Policy of the Health Authorities?

Telemedicine is without any doubt an option clearly favored by the healthcare authorities in most of Spain's autonomous communities. One of the objectives established by national plan for quality healthcare (*Plan de Calidad para el Sistema Nacional de Salud*) proposed by the Spanish Ministry of Health and Consumer Affairs in April 2007 is to identify the most important telemedicine programs in Spain. The plan also includes an online healthcare strategy (*Sanidad en Línea*) aimed at promoting telemedicine by providing information about this technology and raising awareness of this issue throughout the national health system. This strategy also encompasses e-training of medical and healthcare professionals.[6]

For over 5 years, a number of regional health authorities have spared no effort to favor the allocation of healthcare resources (mainly structural and technological resources) to further the deployment of telemedicine within their regions. It is hard to say whether this strategy has been driven primarily by planning criteria drawn up in an effort to cover the needs arising from deficiencies in healthcare coverage.

In several autonomous communities, the authorities have designed pilot studies to assess the feasibility of telemedicine, although the results have rarely been made public and published results have failed to demonstrate any tangible improvement in healthcare. In some autonomous communities (Extremadura for example) telemedicine and teledermatology have been implemented as standard components for both healthcare and medical training. In others, the Canary Islands for example, teledermatology has been removed from the schedule of general healthcare services covered because it was found to be less effective and more expensive than conventional care.[7]

In some autonomous communities, the incorporation of telemedicine into routine practice has been driven by healthcare resource allocation policies related to the devolution of authority for health care to the local governments. As such expenditure is the result of decisions taken because of political commitments, it can be related to discretional activities that do not necessarily contribute any real benefit. it can be related to discretional activities that do not necessarily contribute any real benefit. This type of expense is difficult to assess and almost impossible to control. It generally involves large amounts of money and is related to investment in emerging technologies.

What is required is some kind of map or registry of the telemedicine and teledermatology programs that have been deployed by the regional health authorities. This should include a record of the processes used to assess the performance and effectiveness of such programs. There is also a need for a national, or even supranational, body able to coordinate the existing programs and ensure the compatibility of technical specifications (information technology standards) for the transmission of data relating to the population served throughout Spain. Otherwise, differences between telemedicine programs could lead to a paradoxical situation in which these systems would create inequities between regions in terms of the healthcare services available. Healthcare professionals and companies that provide healthcare have launched an initiative to address this problem, and it is interesting to note that this initiative has come from the private sector and not from the regional or national healthcare authorities.[8]

We now find ourselves in an ex post facto situation in which the use of telemedicine is becoming more generalized even though the technology and instruments involved have been assessed only superficially. The advantage of this situation is

that information on the effectiveness of these systems (in terms of reliability, validity, and user satisfaction) is being made available, and the situations in which teledermatology may be efficient are being identified. However, there is still insufficient evidence to determine whether or not these indications will eventually amount to real improvements in the healthcare situation of the population. The drawback of this deployment is that resources have already been allocated and demand has been created. Moreover, some experts view the forced introduction of teledermatology into hospitals without the support of resources specifically assigned to this service as an example of potentially dangerous abuse on the part of the healthcare authorities (British Association of Dermatologists Teledermatology Interest Group).[9,10]

Is Teledermatology Useful?

One aspect of teledermatology emphasized by all authors is that it is complementary and does not replace the conventional healthcare model. However, in view of the benefits theoretically attributed to teledermatology in terms of cost reductions, improved equity, and continuity of healthcare, we must accept that this healthcare delivery system could eventually replace conventional in-person medical consultations, in the outpatient setting at least. Why have outpatient teledermatology services not been established? Let us look more closely at the reasons.

First, we should bear in mind that face-to-face consultation remains the gold standard for diagnosis; and while the aim of teledermatology is to achieve the quality of this reference standard, the conventional service should be maintained as long as the resources and conditions for offering it are available. It is impossible to properly manage a disease without a precise diagnosis.

Furthermore, it remains unclear who will be interested in investigating the cost and effectiveness of the practical application of teledermatology. A recent systematic review of studies published in recent years reveals an exponential increase in the number of phase II studies (studies for building hypotheses on the feasibility of potential uses of teledermatology).[11] However, there are very few phase III studies (randomized controlled trials), and phase IV studies (randomized controlled trials that analyze benefits and costs) are very rare. Moreover, the few authors who investigated real situations after a program had been implemented undertook uncontrolled observational studies. It appears that this trend is unlikely to change in the next few years. Whether or not this situation indicates a lack of interest on the part of those responsible for implementing teledermatology programs once they have been set up and incorporated into routine practice, it is clear that the lack of hard data on the results obtained in real situations should limit the general deployment of these systems as an alternative to conventional face-to-face consultation.

In theory, any patient could be a candidate for receiving care by way of telemedicine.[3] However, as the arguments expounded above demonstrate, this alone does not justify the generalized and indiscriminate implementation of such services. It is not reasonable to suggest that the mere implementation of a service will guarantee its effectiveness, and the consequences of creating an unjustified demand must be emphasized. The aim of teledermatology should be to proactively seek out innovative alternatives in specific areas where it can enhance or improve the model of conventional consultation. Only then will we be able to evaluate the utility of teledermatology and rationally plan the delivery of the services it can provide.

In conclusion, I wish to reiterate that teledermatology needs to achieve better levels of acceptance and satisfaction among the medical and paramedical personnel involved in its implementation; and to achieve this goal the competent authorities will have to introduce target-based incentive schemes and professional motivation policies, and promote self-management and autonomous action on the part of doctors and healthcare professionals. The ball is once again in the court of the healthcare authorities.

Conflict of interests.
The author declares no conflicts of interest.

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