EDITORIAL

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Clinical usefulness of remote patient monitoring using e-Health technologies in patients with inflammatory bowel diseases

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Inflammatory bowel diseases (IBDs), including Crohn's disease (CD) and ulcerative colitis, are characterized by intermittent disease flares that require unscheduled hospital visits, modifications to medications, surgical interventions, and hospitalization [1]. In recent decades, the incidence of IBD has increased steadily worldwide, and dramatically in developed Asian countries, including Japan, Hong Kong, Singapore, and Korea. This increasing prevalence of IBD has increased the use of limited medical resources and lengthened outpatient waiting lists for specialty treatment. In addition, non-adherence to medication and management, which leads to disease flare-ups, has been reported in about 30% of patients with IBD [2]. Such non-adherence has been attributed to the lack of easy access to specialized IBD clinics and a lack of patient education about, and understanding of, the importance of early treatment of relapses [3].

Traditional face-to-face patient care is the ordinary reactive approach to manage IBD based on patients' symptoms and signs. Recent evidence has shown that a more proactive approach based on continuous or periodic monitoring of disease activities and biomarkers results in better outcomes with respect to sustained clinical remission and mucosal healing. Frequent, regular monitoring of disease activities and biomarkers between routine clinic visits and patient engagement in self-care may promote an early intervention during disease management and minimize the demands on medical resources. In addition, patients' participation in their healthcare may reduce medication non-adherence [4].

In recent decades, information technology (IT) and communication technology (CT) have dramatically advanced and often overlapped. They are referred to as ICT and have influenced both the healthcare system and medical practice. E-health is a healthcare practice that employs ICT and uses various smartphone applications, internet-based programs, and virtual clinics that have been designed to enable the exchange of medical information between patients and medical professionals. Telemedicine is the application of e-health technologies to provide healthcare services at a distance, without a traditional face-to-face clinic visit. E-health systems enable health maintenance and include monitoring of symptoms, disease activity, and adherence to treat-

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ment and medications [5]. E-health has been adopted in self-management programs for various chronic illnesses, including diabetes mellitus, hypertension, asthma, chronic obstructive pulmonary disease, and congestive heart failure [5]. However, the role of e-health in IBD has been insufficiently studied.

Therefore, E-health technologies are a promising self-management modality that enables to reduce the growing burden of IBD on healthcare resources [3,6]. Most clinical trials evaluated the role of e-health in IBD patients had small sample sizes, were performed in single centers, and explored only feasibility. In this issue, Kim et al. [7] performed a relatively large, prospective, multi-center, observational study implementing a web-based, self-reporting, Crohn's disease symptom diary (CDSD) to manage CD. In this study, 143 patients with CD assessed their symptoms at home at least weekly and reported using a web-based CDSD over a median 20-month follow-up period. The authors focused on disparities, which were situations in which patients experienced clinical symptoms at home but did not report them during their routine clinic visits. Healthcare providers may have usually failed to recognize disparities. Web-based CDSD reporting identified that 33.6% of patients with CD experienced disparities and they are associated with unscheduled hospital visits due to disease flares (hazard ratio, 3.82; 95% confidence interval, 1.56 to 9.38) [7]. Unscheduled healthcare visits, especially emergency room visits, for disease flares are surrogate markers for a poor outcome. These results supported that continued care based on sustained monitoring reduces unscheduled hospital visits during IBD care [3]. Therefore, disparities in disease activity observed by remote monitoring are useful to identify patients with CD who are at high risk for clinical exacerbation.

Other studies have also explored the effects of internet or smartphone-based intervention on disease activity in patients with IBD. Elkjaer et al. [8] conducted a randomized controlled study that used web-based management of IBD in 333 patients in Denmark and Ireland. Eighty-eight percentage of the patients in the web-based management group reported that they preferred using this e-health approach. Their adherence increased about one-third during the 4-week study, compared to that of the control group. Another multicenter randomized trial was assigned 170 patients aged 10 to 19 years with IBD in clinical remission to telemonitoring of symptoms and fecal calprotectin levels. Based on the results, the patients were advised to a test interval, treatment, and hospital visits. The telemonitoring group showed fewer face-to-face visits after 52 weeks compared with the conventional follow-up group, which resulted in annual median costs savings [9]. A recent systematic review of the use of e-health technologies in IBD concluded that the results of most clinical trials have associated telemedicine with improved quality of life and patient knowledge and with decreased use of healthcare resources and have reported high patient satisfaction, decreased indirect costs to patients, and no decrease in the quality of the care delivered [6].

The current roles of telemedicine include teleconsultation/telecare (remote delivery of care), telemonitoring (use of mobile/wearables devices to track patients' symptoms/signs), and tele-education (use of technology to enhance patient and provider education) [10]. To enhance the use and efficacy of telemedicine, several concerns should be resolved, including cybersecurity, the need for informed consent, the responsibility for the medical care delivered, and the licensure restrictions to provide teleconsultation/telecare. However, telemedicine has the potential to improve accessibility with regard to IBD specialty care, to improve the efficiency of care, to decrease both direct and indirect healthcare costs and, potentially, to improve healthcare outcomes. IBD presents in the second to fourth decades of life, and the majority of patients with IBD appears to be familiar with e-health taechnologies, particularly smartphones and the internet. Therefore, the use of telemedicine to care for patients with IBD will be increased in the near future due to widespread patient access to the internet and smartphones.

Conflict of interest

No potential conflict of interest relevant to this article was reported.

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