

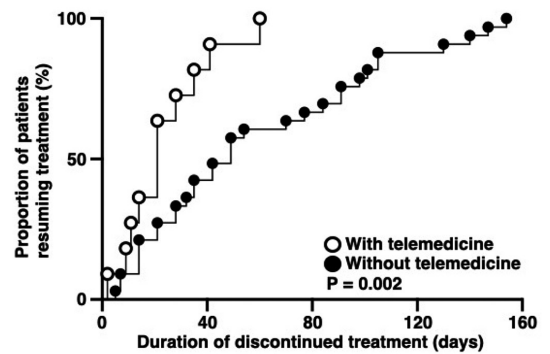
COVID-19 pandemic highlighted the importance of telemedicine in the collagen disease of systemic sclerosis

Sir,
 Coronavirus disease 2019 (COVID-19) is now spreading worldwide and has restricted people's outreach (1). As a result, patients' visits to medical facilities are affected. Systemic sclerosis (SSc) is a collagen disease resulting in systemic fibrosis on autoimmune features (2, 3). As no fundamental treatment has been developed, regular check-ups by specialists and continued treatment are necessary. However, due to the COVID-19 pandemic, patients may hesitate to visit the clinic (4). In recent years, the application of information and communication technology in the medical field, called telemedicine, has been attracting attention. In Japan, Society 5.0, the vision for the future released by the Japanese government, aims to promote the widespread use of telemedicine (5, 6). In April 2020, the Ministry of Health, Labor and Welfare approved telephonic telemedicine in Japan as a particular measure in the face of the COVID-19 pandemic. In this study, we examined the impact of the COVID-19 pandemic on visit status of SSc patients at our centre, the only SSc centre in Japan, and the patient benefits of telemedicine.

In this study, we retrospectively enrolled 419 SSc patients who visited our centre between January and March, 2020. No inpatients were included among these patients. We defined treatment discontinuation patients as those who stopped visiting our centre on their own initiative without physicians' instruction and whose prescriptions were interrupted. We examined the presence and length of treatment discontinuation after April 2020, when telephonic telemedicine was approved. Telephonic telemedicine in this study consisted of a medical examination by an interview and prescribing drugs. The approval for this telemedicine was notified nationwide by the Japanese government, and patients voluntarily decided whether to use it or not. We also compared the amount of change in laboratory values before and after April 2020. Background data were compared by using the Mann-Whitney U test (for continuous variable) and Fisher's chi-square test (for categorical variable). The log-rank test was used for the comparison of time to resuming treatment among patients who discontinued the treatment. The ethics committee approved this study at the University of Tokyo Hospital.

Of the patients included in the study, 198 patients (15 males and 183 females) used telemedicine, while 221 patients (18 males and 203 females) did not use it. No significant differences in background data, such as the severity of the disease, type of

Fig. 1. Comparison of time taken to resume treatment with and without telemedicine. Among patients who discontinued treatment during the COVID-19 pandemic, we examined how long the discontinuation of treatment differed with and without telemedicine. In the group of patients using telemedicine, all patients resumed treatment within 60 days from treatment interruption. Meanwhile, in the group of patients who did not use telemedicine, the time required to resume treatment for all patients was 154 days. The *p*-value of the log-rank test for time to resume treatment between the two groups was 0.002.



treatment, and frequency of complications, were found between these two groups. In more detail, SSc-associated interstitial lung disease was complicated by 30.3% and 29.4% of patients in the telemedicine and non-telemedicine groups, respectively (*p*=0.915). Besides, 23.7% of patients in the telemedicine group and 19.9% of patients in the non-telemedicine group were treated with prednisone (*p*=0.344). 14.1% of patients in the telemedicine group were administered immunosuppressive drugs, compared to 14.5% of patients in the non-telemedicine group (*p*=1.000). The number of patients who discontinued treatment was significantly lower in the telemedicine group, with 11 patients (5.56%), compared to 33 patients (14.93%) in the non-telemedicine group (*p*=0.002). These patients who voluntarily discontinued treatment were finally resumed. However, the time required to resume treatment differed between the two groups. This means that the duration of treatment interruption was significantly shorter in the telemedicine group, with a mean (\pm standard deviation) of 1.34 (\pm 6.7) days compared to 8.8 (\pm 27.1) days in the non-telemedicine group (*p*=0.001). Furthermore, among the patients who had discontinued treatment, the telemedicine group resumed treatment earlier than the other group (*p*=0.002; Fig. 1). In more detail, all patients in the group that received telemedicine resumed treatment within 60 days. In contrast, only 54.5% of patients who did not receive telemedicine resumed treatment within 60 days. There was no difference in the amount of change in laboratory data between the groups receiving telemedicine and those not receiving telemedicine.

For the first time, this study suggests that telemedicine may help SSc patients to continue and/or resume treatment under the COVID-19 pandemic. SSc is associated with fatal complications, such as interstitial lung disease (7). Because of the autoimmunity involved in SSc pathogenesis, prednisone and immunosuppressive agents have been used as treatment (8). Thus, disruptions in treatment can lead to worsening of symptoms and missed opportunities for early interventions for complications. Certainly, patients who use telemedicine may be

more motivated to treat, and this retrospective study has not completely eliminated this bias. Nevertheless, this study suggests that telemedicine can be useful in treating SSc and other diseases that require ongoing treatment in the COVID-19 disaster.

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References

- ZHU N, ZHANG D, WANG W *et al.*: A Novel Coronavirus from Patients with Pneumonia in China, 2019. *N Engl J Med* 2020; 382: 727-33.
- MEDSGER TA, Jr.: Natural history of systemic sclerosis and the assessment of disease activity, severity, functional status, and psychologic well-being. *Rheum Dis Clin North Am* 2003; 29: 255-73.
- YOSHIZAKI A, SATO S: Abnormal B lymphocyte activation and function in systemic sclerosis. *Ann Dermatol* 2015; 27: 1-9.
- CONTRERAS CM, METZGER GA, BEANE JD *et al.*: Telemedicine: Patient-Provider Clinical Engagement During the COVID-19 Pandemic and Beyond. *J Gastrointest Surg* 2020; 24: 1692-7.
- Council of Science, Technology and Innovation, 2016. Fifth Science and Technology Basic Plan. Government of Japan, Tokyo.
- MAVRODIEVA A, SHAW R: Disaster and climate change issues in Japan's Society 5.0 - a discussion. *Sustainability* 2020; 12: 1893.
- LEROY EC: Morbidity and mortality of rheumatic and diffuse connective tissue diseases. *Trans Assoc Life Insur Med Dir Am* 1989; 72: 101-4.
- DENTON CP, KHANNA D: Systemic sclerosis. *Lancet* 2017; 390: 1685-99.