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Rapid Communication

The impact of the COVID-19 pandemic on asthma treatment in Japan: Perspectives based on doctors' views

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ABSTRACT

The coronavirus disease 2019 (COVID-19) pandemic has had a great influence on medical practice in Japan. In this study, an online questionnaire-based survey was conducted among doctors routinely involved in the treatment of asthma. The questions included in the survey pertained to their thoughts on asthma treatment amidst COVID-19, changes in their clinical approach toward patients with asthma, and the behavioral changes in patients in the pandemic era. The results revealed a significant impact of the pandemic on asthma treatment. Regardless of whether or not they were directly involved in the treatment of patients with COVID-19, the doctors had avoided using nebulizers in outpatient wards/clinics and routine pulmonary function testing. An increase in canceled appointments and inappropriate/non-adherence to treatment among their patients were noticeable. Furthermore, the survey revealed an extensive impact of the pandemic on the doctors engaged in asthma treatment irrespective of the differences in their medical backgrounds.

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More than a year has passed since the first reported case of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) was confirmed in Japan in January 2020. Although viral infections are generally a threat to asthmatic patients [1], several studies have shown that patients with asthma are not necessarily more susceptible to SARS-CoV-2 infection [2,3]. Many authorities including, the US Centers for Disease Control and Prevention and American Thoracic Society provide information to assist physicians, patients, and their families to manage asthma while living through the coronavirus disease 2019 (COVID-19) pandemic, including guidance on aerosol-generating procedures such as spirometry and nebulization therapy (Supplementary Table 1). However, avoiding these procedures could pose difficulties in accurately assessing, monitoring as well as managing the condition of asthma patients. To our knowledge, no clear data is available on the effect of the COVID-19 pandemic on behavioral changes related to the treatment of asthma among both doctors and patients in Japan, where the disease phenotype has been milder and less restrictive measures have been enacted compared to other countries.

Therefore, the purpose of this study was to understand the impact of the COVID-19 pandemic on asthma treatment in Japan, especially from the doctor’s perspective. Asthma treatment could be influenced to varying degrees depending on a number of factors related to doctors’ medical background. Hence, we invited doctors with different specialties (e.g., pulmonologists, pediatricians, allergists), in different hospital sizes (from clinics to large hospitals), and with different levels of involvement in the treatment of patients with COVID-19 to participate in an online questionnaire-based survey. The details of the methods and the questionnaire are available in the Supplementary Methods and Supplementary Table 2, respectively.

A total of 910 doctors participated in the survey. The basic characteristics of the respondents are depicted in Table 1 and Supplementary Table 3. The study focused on six questions that the doctors had to respond to. Question-12 (Q12) inquired about the doctor’s view regarding the treatment of asthma in the COVID-19 era, Q15 and Q17 pertained to changes in the clinical approach to patients with asthma, and Q18, Q19 and Q20 covered the behavioral changes in patients. The obtained responses in every respect reflected a significant impact of the COVID-19 pandemic on treatment of asthma (Fig. 1).

For query Q12, 470 (51.9%) respondents felt that more attention than before is required to effectively have good control on asthma, even though asthma has little effect on the susceptibility to and/or severity of SARS-CoV-2 infection (Fig. 1a, Supplementary Table 4a).

In response to Q15, 380 (42.2%) doctors recommended avoidance of nebulizers in outpatient wards/clinics (Fig. 1b), and this was especially true among pediatricians (52.1%) (Supplementary Table 4b). As compared to doctors working outside the COVID-19 pandemic areas, those working within seemed to be forced to replace ciclesonide, a glucocorticoid commonly used in the treatment of asthma and reported to suppress the replication of coronaviruses [4], with other inhalers due to limited supply (Supplementary Table 4b).

Answering Q17, a number of respondents reported avoiding routine pulmonary function testing (PFT) (42.2%) or conducting fractional exhaled nitric oxide measurements and blood tests at the time of a patient’s initial visit and/or when making a diagnosis of asthma (23.5%). A few even avoided performing chest auscultation (7.3%) (Fig. 1c). These changes were particularly evident among respiratory physicians and doctors working at hospitals with more than 500 beds or where patients with COVID-19 were hospitalized (Supplementary Table 4c).

In reply to Q18, 389 (43.0%) respondents noticed an increase in canceled appointments among patients (Fig. 1d). This was more likely to be found among doctors working in hospitals (54.5%), especially those with a larger number of beds, and with COVID-19 hospitalization (Supplementary Table 4d). Almost 30% of the respondents observed that the number of newly diagnosed patients with asthma had decreased. These reflected a delay or avoidance of medical care due to COVID-19 related concerns rather than an actual decrease in new asthma cases [5]. Moreover, 54 (11.6%) respiratory physicians and nine (15.5%) allergists reported that their patients had asked for a particular prescription including ciclesonide. Almost 90% of all respondents answered that some of their asthmatic patients had avoided their regular visits to clinics, and this was particularly the case among pediatricians (Q19; Fig. 1e, Supplementary Table 4e).

Regarding the inappropriate treatment practices by patients (Q20), 312 (35.1%) doctors reported that their patients had discontinued or reduced their asthma controlling medications, including oral steroids and/or biologics, based on their own judgment, or had increased the use of reliever medications (6.0%) (Fig. 1f). The inappropriate use of controller medications was noticed more often among pediatricians (43.7%) and at clinics where doctors worked (56.1%) or facilities without beds (56.3%) (Supplementary Table 4f). Although it appears that COVID-19 is less prevalent and less severe in children than in adults [6,7], pediatricians felt that their patients were more likely to avoid regular appointments and to discontinue or decrease their controller medications based on their own judgment. The fears of parents, especially for the possible risk of infection [8], could have caused them to avoid the regular visits to clinics, resulting in the discontinuation of or a decrease in controller medications, especially for childhood asthma. The reduced frequency of regular clinical visits results in a delay of accurate diagnosis and assessment of the disease status, which may in turn delay the commencement of an appropriate treatment approach. On the contrary, due to the increased preventive behaviors, including mask-wearing, improved adherence to preventive medications [9], and school closures, asthma symptoms were more controlled during the outbreak, especially in childhood asthma [10]. These factors may also have given pediatricians the impression that inappropriate treatment was prevalent in their patients with asthma.

The limitations of this study are discussed in the Supplementary Methods.

In summary, the results of this survey revealed an extensive impact of the COVID-19 pandemic on doctors who are engaged in asthma treatment, irrespective of their actual involvement in the treatment of patients with COVID-19. The Japanese health care professionals involved in the treatment of asthma patients are facing new challenges during the
Fig. 1 – Impact of the COVID-19 pandemic on asthma treatment in Japan. Responses of doctors to each of the six questions to the online questionnaire-based survey have been depicted. (a) Question-12 (Q12) inquired about the doctor’s view regarding the treatment of asthma; (b) Q15 and (c) Q17 pertained to changes in the clinical approach to patients with asthma; (d) Q18, (e) Q19 and (f) Q20 covered the behavioral changes in patients. ER, Emergency room; PFT, pulmonary function test; FeNO, fractional exhaled nitric oxide; FOT, forced oscillation technique.
current exceptional pandemic period. Doctors are noticing a reduced number of routine clinical visits by their patients and the avoidance of PFT, even when they make a diagnosis of the disease, so as to minimize exposure to SARS-CoV-2. We also found that differences in the medical backgrounds of the respondents had some influence on the impact of COVID-19. Given the rapidly increasing knowledge of COVID-19, both the general population and health-care workers continuously

Table 1 — Basic characteristics of the respondents.

| Total number of participants | 910 | 100% |
|-----------------------------|-----|------|
| Q1. Academic society/societies to which the respondent belongs\(^a\) | | |
| The Japanese Society of Allergology | 709 | 77.9% |
| The Japanese Respiratory Society | 523 | 57.5% |
| The Japanese Society of Pediatric Allergy and Clinical Immunology | 316 | 34.7% |
| The Japan Asthma Society | 135 | 14.8% |
| Q2. Medical specialty (primary) | | |
| Respiratory Medicine | 468 | 51.4% |
| Pediatrics | 334 | 36.7% |
| Allergy | 58 | 6.4% |
| Others\(^b\) | 50 | 5.5% |
| Q3. Prefecture in which the respondent works\(^b,c\) | | |
| Pandemic area | 395 | 43.4% |
| Non-pandemic area | 512 | 56.3% |
| No response | 3 | 0.3% |
| Q4. Facility/facilities where the respondent works\(^b\) | | |
| Clinic only | 317 | 34.8% |
| Hospital | 590 | 64.8% |
| Other | 3 | 0.3% |
| Q5. Number of beds in the respondent’s facility | | |
| None | 319 | 35.1% |
| <200 | 87 | 9.6% |
| 200–499 | 237 | 26.0% |
| ≥500 | 267 | 29.3% |
| Q6. Years of clinical experience | | |
| <5 | 4 | 0.4% |
| 5–10 | 63 | 6.9% |
| ≥11 | 843 | 92.6% |
| Q7. Age group of patients the respondent treats | | |
| Mainly adults | 484 | 53.2% |
| Mainly children | 299 | 32.9% |
| Both adults and children | 127 | 14.0% |
| Q8. Number of asthmatic patients the respondent treats every week | | |
| <5 | 133 | 14.6% |
| 5–19 | 351 | 38.6% |
| ≥20 | 426 | 46.8% |
| Q9. Involvement of the respondent’s facility in the treatment of patients with COVID-19\(^a\) | | |
| Involved in the treatment of hospitalized patients | 391 | 43.0% |
| Not involved | 299 | 32.9% |
| Involved in the treatment at an outpatient clinic including consultations for returnees/contacted persons | 131 | 14.4% |
| Other\(^d\) | 95 | 10.4% |
| Q10. Presence of with COVID-19 positive patients among the respondent’s asthma patients | | |
| Yes | 46 | 5.1% |
| No | 834 | 91.6% |
| I don’t know | 30 | 3.3% |

\(^a\) Multiple choices allowed, and/or respondents selected multiple choices.

\(^b\) The details of this choice are described in Supplementary Table 3.

\(^c\) The pandemic area was defined as six prefectures (Okinawa, Tokyo, Osaka, Hokkaido, Kanagawa, and Aichi), where the cumulative number of COVID-19 infections per million population as on December 1, 2020 was above the total in Japan.

\(^d\) Free-text description.
need to stay abreast of updated information. In addition, it is necessary that we provide clear guidance that would include pertinent information on the importance of regular patient visits for efficient disease control measures and provide assurance that asthma patients with well-controlled symptoms are not particularly at high risk of developing severe COVID-19 infection.

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Conflict of Interest

The authors have no conflict of interest.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.resinv.2021.06.004.

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