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Gender disparities in the pediatric allergy-related guidelines in Japan

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Abstract

Background: Inclusion of female authors has been noted as potentially beneficial in the development of medical guidelines. Japanese professional committees representing allergic subspecialties develop practical guidelines with recommendations to caregivers, but these committees may be influenced by their gender composition. The objective of our study was to examine the influence of gender in developing pediatric allergic disease guidelines in Japan from 1999 to 2020.

Methods: We examined the gender differences among the guideline committee members: allergic rhinitis, atopic dermatitis, bronchial asthma, and food allergies in Japan. We examined the gender composition of the committees, annual trends, and differences in guideline content.

Results: The median proportion of women members among the 22 guidelines committees was 6.6% (range: 0%–27.3%). The analysis of the quadrant period did not show a significant increase in the proportion of female members. The food allergy group had a significantly higher proportion of female members than other guidelines ($P < 0.01$), but the proportion decreased from 25% to 14.3% during the observation period. For the pediatric asthma guidelines, the proportion of female committee members decreased from 5.3% in the 2000 version to 0% in the most recent revision in 2017.

Conclusions: The proportion of women on the committees that develop pediatric guidelines continues to be low and has not improved over the past 20 years.

Key words: allergy, gender, guidelines, pediatrics, sexism

List of abbreviations

JSA: the Japanese Society of Allergology

JPGL2017: the Japanese pediatric guideline for the treatment and management of asthma 2017

GINA: Global Initiative for Asthma

CPG: clinical practice guideline

Introduction

Gender parity among authors of scientific papers is an excellent indicator of gender equality in academic societies.¹ The participation of female authors in scientific papers is positively correlated with the presence of sex and gender analysis.² Although the inclusion of women in clinical practice guidelines (CPGs) has not always been proven to have a direct effect,³ it is expected to promote innovation through diversity, contribute to professionalism, broaden discussion, and enhance gender-related descriptions.⁴ In American college of Cardiology, consideration to gender parity among CPG committee members is strongly recommended,⁴⁻⁶ and the detailed chronology of gender parity in practice guidelines has been reported.³

During the last two decades, an increasing number of detailed practice guidelines have been issued by medical professional associations in Japan to treat pediatric asthma, food allergies, and other allergic diseases. However, to our knowledge, the literature does not report studies that examined the gender parity among CPG committee members in the field of pediatric allergy and immunology nor did we retrieve any literature that examined gender parity in CPGs in Japan or their chronological changes.

The objective of this study was to provide the first quantitative assessment of gender parity and change over time for major pediatric allergy-related CPGs in Japan as a benchmark for future changes. As mentioned, the gender composition of the committee members may influence the details of patient-care recommendations. Therefore, we would like to discuss the implications of gender parity on actual clinical practice recommendations of the CPGs after quantification.

Methods

Target guidelines

We studied CPGs published in Japan for major pediatric allergic diseases (allergic rhinitis, atopic dermatitis, pediatric asthma, and food allergies) between 1999, when the Basic Law for Gender Equality was enacted, and August 2020.⁷⁻¹⁰ We examined the major revisions but not intermediate steps that would usually be written by the same committee members as the previous major revisions.

Secondary guidelines accompanying the main guideline (such as those on pediatric asthma in severely disabled children) were not examined, except for the 2009 guidelines on oral

food challenge test,¹¹ which were a progression from the previous guidelines.

Before integrated guidelines were published in 2018, only the series published by the Japanese Society of Allergology (JSA) was considered for the study of atopic dermatitis guidelines. The other guideline series published by the Japanese Dermatological Society until 2016 were not included because their specific target audience was professional dermatologists, not allergists.¹²

The committee members for the guidelines included editorial advisors and directors, but editorial collaborators and system reviewers who were not involved in preparing the guideline text were excluded from consideration.

Gender discrimination

In the Japanese language, the gender of a name is easily discernible; two independent physicians (EI and YT) determined the genders of the guideline authors based on the family name or their familiarity with the individual. If the name was gender-neutral and could not be determined by two physicians, the gender was determined by two experienced pediatric allergists (YO and TC, included in acknowledgments) who have been members of the JSA since 1999. A direct referral to the author's institution was never necessary.

Statistical analysis

We compared the percentage of women involved in prepare each set of guidelines during the study period. To analyze the trends over time, the study period was divided at five-year marks, and the trends were compared between the groups. One-way analysis of variance (ANOVA) and Cochran–Armitage test (for trend analysis) was used for the test; if there was a significant difference in ANOVA, Tukey's post-test was performed for individual group differences. *P* values of < 0.05 were considered significant. **We used Graphpad Prism version 5 (GraphPad Software, San Diego, CA, USA) for our statistical analyses.**

Ethical considerations

This study did not require ethical review as it was based on published information in the literature and included no clinical data or personally identifiable information.

Results

We examined 22 CPGs for this review (Table 1). The median percentage of female committee members was 6.6% (0%–27.3%), with no significant changes seen in these percentages over the four study periods (Figure 1A) (NS, Cochran–Armitage test).

When looking at the different allergies covered in this study, food allergies had a significantly higher proportion of female physicians than the other three diseases (Figure 1B) ($P < 0.01$, one-way ANOVA, Tukey's post-test). When the first edition of the food allergy guideline was published, 25% of the committee members were women. However, the percentage of female committee members declined after the 2012 revision, falling to 14.3% in the 2016 edition; this was a decline from the highest level in 2009 when women were 27.3% of the guideline committee.

The number of women involved in writing the asthma guidelines has had a progressive downward trend, with no female committee members involved in preparing the most recent edition published in 2017. Women were not included in developing the atopic dermatitis guidelines until the 2009 edition, but the number has increased since then, reaching 11.8% in the latest edition. The allergic rhinitis guideline added one woman to the guideline committee for the 2013 and 2016 revisions, but the number of women has returned to 0% in the latest version in 2020 (Figure 1C).

Discussion

Although the Japanese Basic Law for a Gender-Equal Society was formulated in 1999, most committees to develop CPGs for pediatric allergic diseases have been limited to male clinicians. In the past 20 years, the number of women on these committees has not increased.¹³ **The 6.6% female rate we obtained is extremely low, considering that the median rate of female authors in CPGs on allergy and immunology published worldwide is 36.7% and that in pediatrics is 41.8%.¹⁴**

Gender gap index in Japanese society for 2019 ranked 121 out of 199 countries.¹⁵ Similarly, the gender imbalance in Japanese medical schools and professional associations is also considerably worse than in other developed countries. The number of female members in the JSA reached 27.3% in 2016, but the proportion of women on the Board of Representatives is 11.5%, with no female directors.¹⁶ In contrast, 32.6% of allergy/immunology academic faculty in the U.S. is women. The ratio of women in American medical school faculties is 30%, and the number of

tenured female professors is 17%, much higher than their Japanese counterparts.¹⁷

A 2020 survey of members by the Japanese Society for Pediatric Allergy and Clinical Immunology (JSPACI) found that 77.3% of female physicians had experienced career interruptions compared with 11.6% of male physicians, 53.6% of which were attributed to pregnancy and childbirth.¹⁸ These inequitable maternity and childbirth burdens might be the reasons why female physicians find it difficult to take on managerial posts and are prevented from assuming academic positions with greater responsibilities.¹⁶ This might cause the lower ratio seen in the number of women who are guideline committee members.

Food allergy guideline committees include significantly more female members than other subdisciplines. Food allergy studies have increased dramatically in recent decades, with the number of food allergy presentations at JSPACI annual meetings in 2010 exceeding those of asthma.¹⁹ Thus, the gender disparity in the membership of the two CPGs may simply reflect the guidelines' authors' age differences. Female physicians' preference for the fields of food preparation and nutrition, paralleling women's traditional societal roles, may also have an impact.

These gender differences might influence the specific **practice recommendations** on the CPGs.⁴ **In his well-known monogram on the history of allergy, Jackson details the scene already unfolding in Western societies in the postwar period, where advice against indoor allergens exacerbated the traditional division of gender-dependent labor. Doctors, predominantly male, forced housewives to learn excessive allergen removal, although some pioneering doctors opposed indoor allergen removal guidance for which there was little evidence.**^{20, 21}

In Japan, the male spouse's share of household work is one of the worst in the world based on the 2012 International Social Survey Programme (ISSP) reports.²² The fact that the current asthma guidelines are developed solely by male physicians who are exempt from household work might affect their recommendations.

The Japanese pediatric guideline for the treatment and management of asthma 2017(JPGL2017) still strongly recommend using stringent cleaning methods to remove house dust-mite allergens from the home environment, but the evidence does not back this efficacy of removing indoor allergens.⁹ This strict cleaning protocol is no longer recommended by the International Consensus guidelines from the International Collaboration in Asthma (GINA), Allergy, and Immunology or guidelines from many other countries, including the United States (Expert Panel Report 3).^{23,24} **Additionally,** the “good” control level of JPGL2017 guidelines is to

achieve zero asthma attacks per month,⁹ much more stringent than GINA and American guidelines. The stricter Japanese guidelines place a heavy burden on the caregivers, usually the mothers, without strong evidence that the quality of life of the affected child is improved.

For alleviating the gender disparity in pediatric allergy-related guidelines in Japan, the introduction of a quota system for well-qualified female specialists could be beneficial.²⁵ Simultaneously, professional societies need to work on creating a comprehensive environment for fostering female clinicians to take leadership positions.

This study was limited because the inner workings of the committee selection process are not public, which makes it difficult to know why more women are not included and whether gender disparity considerations are discussed. **Tracking changes over time using the gender data of members registered in the academic societies is necessary to improve the data quality herein.**

The medical guidelines included in the study are a mixture of those developed almost entirely by pediatric allergists (specializing in food allergy, asthma) and those developed by allergists from other specialties (such as, allergic rhinitis, atopic dermatitis). Differences in the percentage of female physicians in each society may make intercomparison of the respective data difficult. However, these problems may have been alleviated to some extent by the recent efforts of the JSA to train general allergists who are not bound by specialty.

In conclusion, this is the first report to address how gender differences in the composition of pediatric allergy guideline committees have changed over time **in Japan**. This study shows the need to diversify the gender composition of these committees and develop guidelines that are gender-neutral.

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Disclosure

The authors declare no conflicts of interest.

Authors' Contributions

EI and TY conceived and designed the study; EI, TY, KM, HY, MK, ST, and BY collected and analyzed the data; EI, TY, KM, KT, BY, and TS interpreted the data. EI and TY wrote the paper manuscript, while KM, BY and TS reviewed and revised the paper. All authors approved the final draft.

References

1. Shah SGS, Dam R, Milano MJ, Edmunds LD, Henderson LR, Hartley CR, et al. Gender parity in scientific authorship in a National Institute for Health Research Biomedical Research Centre: a bibliometric analysis. *BMJ Open*. 2021;11:e037935.
2. Nielsen MW, Andersen JP, Schiebinger L, Schneider JW. One and a half million medical papers reveal a link between author gender and attention to gender and sex analysis. *Nat Hum Behav*. 2017;1:791-6.
3. Tong I, Griffin B, Trott J, Romano M, Stein AB, Madsen TE. The Proportion of Women Authors and the Inclusion of Sex and Gender Content Among the American College of Cardiology Clinical Practice Guidelines, 2008-2018. *J Womens Health (Larchmt)*. 2020. Epub 2020/12/01.
4. Sardar P, Kundu A, Poppas A, Abbott JD. Representation of Women in American College of Cardiology/American Heart Association Guideline Writing Committees. *Journal of the American College of Cardiology*. 2018;72:464-6.
5. Douglas PS, Williams KA, Sr., Walsh MN. Diversity Matters. *J Am Coll Cardiol*. 2017; 70: 1525-9.
6. Abbott JD. Women in Interventional Cardiology: Small Numbers, Big Impact. *Circ Cardiovasc Interv*. 2016; 9: e004423.
7. Japan Society of Immunology and Allergology in Otolaryngology. [Japanese guidelines for allergic rhinitis: Perennial Rhinitis and Hay Fever]. Tokyo: Life Science; 2020. Japanese.
8. Kato N, Ohya Y, Ikeda M, Ebihara Z, Katayama I, Saeki H, et al. [Guidelines for Management of Atopic Dermatitis 2018]. *Jpn J Dermatol*. 2018; 128: 2431-502. Japanese.
9. Japanese Society of Pediatric Allergy and Clinical Immunology. [Japanese Pediatric Guideline for the Treatment and Management of Asthma]. Tokyo, Japan: Kyowa-Kikaku; 2017. Japanese.

10. Japanese Society of Pediatric Allergy and Clinical Immunology. [Japanese Pediatric Guideline for Food Allergy]. Tokyo, Japan: Kyowa-Kikaku; 2016. Japanese.
11. Working Group on Standardization of Oral Food Challenge Tests, Japanese Society of Pediatric Allergy. [Japanese pediatric guideline for oral food challenge test in food allergy]. Tokyo, Japan: Kyowa-Kikaku; 2009. Japanese.
12. Saeki H, Nakahara T, Tanaka A, Kabashima K, Sugaya M, Murota H, et al. Clinical practice guidelines for the management of atopic dermatitis 2016. J Dermatol. 2016; 43: 1117-45.
13. Osawa M. Government approaches to gender equality in the mid-1990s. Soc Sci Jpn J. 2000; 3: 3-19.
14. **Merman E, Pincus D, Bell C, Goldberg N, Luca S, Jakab M, et al. Differences in clinical practice guideline authorship by gender. Lancet. 2018; 392: 1626-8.**
15. Osaki T. From bad to worse: Japan slides 11 places to 121st in global gender equality ranking. [Internet]. Tokyo: the Japan Times; 2019 [cited 2020 Oct 28]. Available from: <https://www.japantimes.co.jp/news/2019/12/17/national/social-issues/japan-121st-global-gender-equality-ranking/>.
16. Nagoshi S, Kajinami K, Nishikawa N, Hiyama K, Betsuyaku T, Masaki T, et al. [Equal participation of men and women in the Japanese Societies of Internal Medicine and Subspecialties.]. J Jpn Soc Intern Med. 2018; 107: 894-9. Japanese.
17. Blumenthal DM, Bergmark RW, Raol N, Bohnen JD, Eloy JA, Gray ST. Sex differences in faculty rank among academic surgeons in the United States in 2014. Ann Surg. 2018; 268: 193-200.
18. Hiraguchi Y, Kato T, Okazaki F, Futamura M, Yasutomi M, Takizawa T, et al. [Japanese Society of Pediatric Allergy and Clinical Immunology "Career Support Survey"]. Jpn J Pediatr Allergy Clin Immunol. 2020; 34: 510. Japanese.

19. [History of the Japanese Society of Pediatric Allergy and Clinical Immunology]. Kanagawa, Japan: The 50th annual meeting of Japanese Society of Pediatric Allergy and Clinical Immunology Secretariat; 2013. Japanese.
20. Jackson M. Allergy : the history of a modern malady. London: Reaktion; 2007.
21. Rapp DJ, Frankland AW. Allergies: Questions and Answers. London: Heinemann Health Books; 1976.
22. **Murata H, Aramaki H. Does Satisfaction with Family Life Depend on How Household Work Is Shared? From the ISSP Survey on Family and Changing Gender Roles. Housou Kenkyu to Chousa. 2015;65:8-20. Japanese.**
23. National Asthma Education and Prevention Program, Third Expert Panel on the Diagnosis and Management of Asthma. Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma [Internet]. Bethesda: National Center for Biotechnology Information. U.S. National Library of Medicine; 2007 [cited 2020 Oct 28]. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK7232/?report=reader>
24. Global Initiative for Asthma [Internet]. Fontana: Global Initiative for Asthma; c2020 [cited 2020 Oct 28]. 2020 GINA Main Report; [about 1 screen]. Available from: <https://ginasthma.org/gina-reports/>.
25. **Coe IR, Wiley R, Bekker LG. Organisational best practices towards gender equality in science and medicine. Lancet. 2019;393:587-93.**

Table 1. Enrolled clinical guidelines

<i>Target Disease</i>	<i>Number of Editions</i>	<i>Years of Edition</i>	<i>Reference Number</i>
<i>Pediatric Asthma</i>	6	2000, 2002, 2005, 2008, 2012, 2017	9

<i>Food Allergy</i>	4	2005, 2009*,2012, 2016	10,11
<i>Atopic Dermatitis</i>	5	2006, 2009, 2012, 2015, 2018	8
<i>Allergic Rhinitis</i>	7	1999, 2002, 2005, 2009, 2013, 2016, 2020	7

Inclusion criteria: practice guidelines for major pediatric allergic diseases (pediatric asthma, food allergy, atopic dermatitis, and allergic rhinitis) published in Japan from **January** 1999 to September 2020, which have undergone multiple major revisions and can be analyzed over time.

The accompanying sub-guidelines were excluded from consideration, except for the 2009 guideline on oral food challenge testing (*reference **11**).

Figure Legend

Figure 1: Changes in gender differences between 1999 and 2020 among Japanese pediatric allergy-related guideline committee members

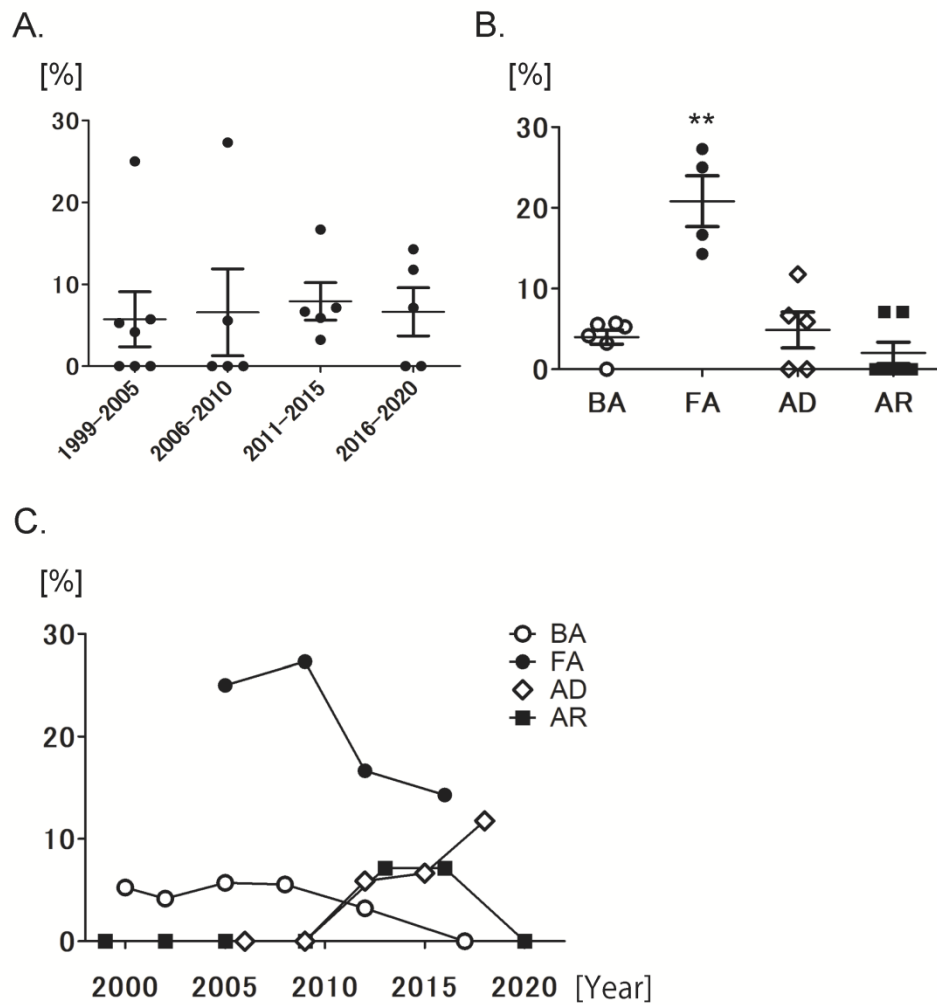
A. Changes in gender differences in all guideline committees over time. The observation period was divided into four five-year time segments to compare disparities between the groups. There is no statistical difference between each of the two groups. (N.S.)

B. Comparison of gender differences among guideline authors by disease. The food allergy guidelines had a significantly higher proportion of female guideline committee members than the other diseases ($P < 0.01$).

C. Changes in guidelines by disease over time.

BA: bronchial asthma, FA: food allergy, AD: atopic dermatitis. AR: allergic rhinitis,

****** $P < 0.01$.



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