Proportion of women presenters at medical grand rounds at major academic centres in Canada: a retrospective observational study

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ABSTRACT

Objective To assess the proportion of women who presented research or medical grand rounds at five major academic hospitals in Canada.

Design A cross-sectional study.

Setting Five major university-affiliated hospitals in Toronto and Calgary.

Results Overall, at all sites and types of academic rounds, there were an average of 17% fewer women presenting than men (P<0.001). There were an average of 32% and 21% more men presenting at the city-wide grand rounds in cities A and B, respectively (P<0.001, P=0.002). There were more male speakers at four out of five types of rounds. The proportion of women presenting on average was proportional to the Canadian workforce, but on average, below the proportion of female residents and medical students (median ratio 1.1, 0.7 and 0.8, respectively).

Conclusion Our study demonstrated a lower proportion of females in an important outlet for academic recognition and role modelling. This provides a possible contributing factor to the under-representation of women in academic medicine and an area that can be systematically targeted to promote equity.

INTRODUCTION

Despite the increasing number of women enrolled in North American medical schools, there is a persistent disparity in female representation within academic medicine. There is a larger proportion of male faculty,1 women are remunerated less for similarly ranked medical and academic positions and there is a discernible under-representation of women in editorial positions and female-led publications within major biomedical journals.2–6 In 2015, only 1 of 16 deans of medical faculty (6%)7 and 2 of 15 chairs of departments of medicine in Canada were female.

Several reasons for the discrepancies have been explored, including lack of female mentorship, difficulties with research establishment, family–work life balance and a proclivity for male-dominated faculty.8,9 The lack of women in academic institutions has been well described, particularly with respect to gender disparities in research productivity and presentation.10 11 Within academic teaching hospitals in Canada, grand rounds provide an important outlet for external exposure and dissemination of scholarly achievements, contributing to academic merit and promotion. Recent studies have described a discrepancy between the proportion and speaking time of women and men presenting at grand rounds12 and at major international conferences.13 14 Given the importance of exposure to colleagues and trainees during large format presentations, there is concern that such systematic disparities preclude women from academic advancement. Additionally, this limits potential mentorship and role modelling opportunities for female trainees. We conducted a retrospective study to assess the proportion of females that presented at research rounds or grand rounds at five major academic hospitals in Canada, from 2011 to 2015. The objective of this study was to identify whether a systematic discrepancy exists and to inform efforts addressing the gender gap within the academic and medical community.

METHODS

We collected publicly available names and dates of presenters at rounds at five major academic hospitals in Canada: a retrospective observational study. BMJ Open 2018;8:e019796. doi:10.1136/bmjopen-2017-019796

Strengths and limitations of this study

Data from multiple centres and different types of rounds were included.

Every medical grand rounds at major academic hospitals in Toronto and Calgary were included.

Results were compared with national proportions.

The process by which each centre selects speakers for grand rounds was unknown to the authors.

Gender was inferred by name and photo, not by asking the presenter directly.
university-affiliated hospitals in Toronto (four) and Calgary (one), between 2011 and 2015. For Calgary, these included the Department of Medicine city-wide grand rounds (CWGR) and the Department of Community Health Sciences/O’Brien Institute for Public Health Seminar series (clinical research rounds (CRR)). In Toronto these included CWGR, medical grand rounds (MGRs), CRR, popular science lectures (pop science) and basic science research rounds (BSRR). To avoid selection and information bias, we identified and included all eligible rounds and speakers in the analysis. Raw data were compiled by individuals blinded to the study intent. Gender was determined by the authors based on the name of the presenter; if there was ambiguity, then the authors determined the gender based on photos. To our knowledge, there is no formal system for selecting presenters; currently, they are invited at the discretion of the organizing committee. Any individual can present, regardless of their association with an institution. Each type of rounds targets a different population of medical professionals. MGR are presentations attended by and targeted to the department of medicine at each individual hospital including faculty, residents and medical students. CWGR are select MGRs that are broadcasted to all the teaching hospitals in the city. The different research-specific rounds, CRR and BSRR, target health service researchers and basic science researchers, respectively. Finally, the pop science lectures target high school students.

The percentage of rounds presented by at least one female speaker was calculated for each calendar year and type of rounds. We compared our results with workforce data, including the national proportion of female internal medicine physicians, residents, medical students, with values of 37%, 49% and 57%, respectively. The proportion of female faculty in internal medicine at both the University of Calgary and University of Toronto was 35%, thus comparable with the national average, so it was not included in the analysis. A simple t-test was used to compare the mean percentages of female and male speakers, and a one-sample t-test was used to compare the mean proportion of female speakers with the national proportion of female internists, medical students and residents. The ratio of mean female speakers to workforce data was calculated by dividing the mean female speakers at each type of rounds over the national proportions. A linear regression was used to analyse proportion of women speakers over time. Any data that were not available were not included in the statistical analysis.

**RESULTS**

There were a total of 1296 rounds that were included. Five hundred and forty-six rounds (42.1%) had at least one female speaker. The percentage of female speakers and number of rounds, by site and type, are illustrated in table 1. On average, there were 17% ($P<0.001$) more male speakers than female speakers at all hospitals from 2011 to 2015. Eight out of 11 types of rounds had a lower mean proportion of female speakers compared with the mean proportion of female medical students in Canada, 7 out of 10 compared with the proportion of residents and 4 out of 10 compared with the proportion of female internist (table 2).

**Table 1** Proportion of rounds with at least one female speaker from 2011 to 2015 based on site and type of rounds

| Site                      | Mean | 2011  | 2012  | 2013  | 2014  | 2015   |
|---------------------------|------|-------|-------|-------|-------|--------|
|                           | %    | % (n) | % (n) | % (n) | % (n) | % (n)  |
| **City-wide grand rounds**|      |       |       |       |       |        |
| A                         | 34   | 29 (10)| 30 (10)| 33 (9)| 33 (9)| 45 (11) |
| B                         | 40   | 35 (40)| 42 (38)| 33 (33)| 48 (39)| NA     |
| **Medical grand rounds**  |      |       |       |       |       |        |
| 1                         | 63   | 55 (11)| 67 (27)| 55 (20)| 69 (29)| 68 (28) |
| 2                         | 55   | NA    | NA    | 54 (39)| 55 (38)| 55 (38) |
| 3                         | 41   | 50 (30)| 43 (28)| 41 (27)| 32 (28)| 40 (25) |
| 4                         | 28   | 26 (49)| 33 (42)| 30 (40)| 21 (38)| 30 (37) |
| **Clinical research rounds**| |       |       |       |       |        |
| 2                         | 62   | 66 (9) | 70 (27)| 62 (29)| 63 (19)| 48 (23) |
| 4                         | 42   | 39 (32)| 30 (40)| 54 (33)| 36 (22)| 50 (10) |
| 5                         | 58   | 57 (30)| 53 (34)| 59 (32)| 50 (30)| 66 (32) |
| **Popular science lectures**| |       |       |       |       |        |
| 4                         | 15   | NA    | 25 (8) | 0 (9) | 11 (9) | 22 (9)  |
| **Basic science research rounds**| |       |       |       |       |        |
| 4                         | 14   | 0 (19) | 17 (20)| 13 (16)| 33 (12)| 5 (19)   |

NA, not available.
As described in table 3, at MGRs, some centres had up to an average of 44\% more male speakers, while others had an equal percent of or more female speakers. There was an average of 32\% and 21\% more male speakers than females at CWGRs at sites A and B, respectively. At CRR, site 4 had 16\% more male than female speakers, while sites 2 and 5 had 24\% and 16\% more female speakers, respectively. Based on the type of rounds, there was a higher percentage of male speakers at every type of rounds except CRR (table 4).

The median normalised ratio of the proportion of women presenting to workforce data of female internal medicine physicians, residents and medical students were 1.1, 0.7, and 0.8, respectively (figure 1). There was no statistically significant change in proportion of female presenters over time (P=0.723).

### Table 2

| Site                  | Difference from national mean |
|-----------------------|-------------------------------|
| Medical students      | National mean=57\%            |
| Residents             | National mean=49\%            |
| Staff                 | National mean=37\%            |
| City-wide grand rounds|                               |
| A                     | 34                            |
| 23*                   | 15*                           |
| 3                     |                               |
| B                     | 40                            |
| 17*                   | 9                             |
| -3                    |                               |
| Medical grand rounds  |                               |
| 1                     | 63                            |
| -6*                   | -14*                          |
| -26*                  |                               |
| 2                     | 55                            |
| 2                     | -6*                           |
| -18*                  |                               |
| 3                     | 41                            |
| 16*                   | 8                             |
| -4                    |                               |
| 4                     | 28                            |
| 29*                   | 21*                           |
| 9*                    |                               |
| Clinical research rounds|                               |
| 2                     | 62                            |
| -5                    | -13*                          |
| -25*                  |                               |
| 4                     | 42                            |
| 15*                   | 7                             |
| -5                    |                               |
| 5                     | 58                            |
| -1                    | -9*                           |
| -21*                  |                               |
| Popular science lectures|                               |
| 4                     | 15                            |
| 42*                   | 34*                           |
| 22*                   |                               |
| Basic science research rounds|                               |
| 4                     | 14                            |
| 43*                   | 35*                           |
| 23*                   |                               |

*P<0.05.

### Table 3

| Site          | Mean difference between M and F (%) | P value |
|---------------|-------------------------------------|---------|
| CWGR          | 32                                  | <0.001  |
| A             | 32                                  | <0.001  |
| B             | 21                                  | 0.002   |
| MGR           | 1                                  | <0.001  |
| 2             | 2                                   | <0.001  |
| 3             | 18                                  | <0.001  |
| 4             | 44                                  | <0.001  |
| CRR           | 2                                  | <0.001  |
| 2             | 2                                   | <0.001  |
| 4             | 16                                  | 0.015   |
| 5             | 16                                  | 0.003   |

### Table 4

| Type of rounds         | Mean difference between M and F (%) | P value |
|------------------------|-------------------------------------|---------|
| City-wide grand rounds | 27                                  | <0.001  |
| Medical grand rounds   | 8                                   | 0.05    |
| Clinical research rounds| 7                                   | 0.06    |
| Popular science lectures| 77                                  | <0.001  |
| Basic science research rounds| 73                                  | <0.001  |

**DISCUSSION**

The data illustrate that over the past 5 years, there have been fewer female presenters at four out of five different types of rounds at five major academic hospitals in Canada. This results in a potential missed opportunity to expose trainees to female leaders, which can be an essential component of supporting female advancement in academic medicine. Previous reports suggest that such disparities contribute to the steady attrition of women in academic medicine as they create an environment that is unsupportive and lacking mentorship.15

To mitigate this potential impact, we have to understand the cause. Possible explanations for this discrepancy are a shortage of female physicians and scientists willing to present or perhaps women are not being invited to present because they are not in decision-making positions for academic meetings.14

Encouragingly, our workforce data demonstrated that the proportion of female presenters is comparable with the workforce, and 4 out of 11 types of rounds had statistically significantly higher proportion of females speakers than the proportion of the national workforce. However, the proportion of female speakers was consistently lower than the proportion of trainees who are women, suggesting one of the root causes is the gender gap in academic medicine itself.
The aim of this report was to look at the representation of female presenters at academic grand rounds across programmes in Canada; however, there are some limitations to the study. One limitation is our lack of understanding of how these programmes recruit speakers and how some can achieve nearly equal representation. To our knowledge, the speaker invitations are at the discretion of the organising administration or committee, and there is no formal system for invitations. This approach would allow for the introduction of a standardised approach to promote equity in large format presentation settings. Another limitation of the retrospective and observational study design was the preclusion of obtaining the information on gender from the presenters themselves, instead the authors inferred gender based on the presenters name and photo. Additionally, we compared the proportion of female presenters to national workforce data in an attempt to represent the denominator of women available to present. Although this comparison does provide us insight into the proportional representation of women in medicine, it does not truly represent the denominator. The denominator cannot be truly quantified given speakers are invited internationally and across scientific disciplines. Finally, our data represent a 5-year period, during which there was no significant increasing or decreasing trend in the proportion of female speakers. A greater follow-up period would be useful to explore in a future study.

Established methods to engage women in medicine have been shown to be successful. For example, a study assessing the impact of women-specific programming to actively support females in all roles within academic medicine, reported improvements in internal partnerships, an increase in females in leadership roles and a rise in job retention and satisfaction. Increasing the number of females presenting at academic conferences targets one aspect of the gender inequity in academic medicine. Carnes et al provide a set of recommendations to address gender linked biases that marginalise females in academia; these include implementing policies that promote institutional support for programmes with diverse representation in large format presentations. They advocate that such efforts promote female advancement and are directly tied to advances in socialised differences affecting women’s health. We believe that future research should address how we can engage women in presenting at various academic rounds and ensuring that women are represented to allow role modelling for trainees and junior faculty.

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