



ARTICLE OF THE MONTH

Women Representation as First and Corresponding Authors in Neuroanesthesiology and Neurocritical Care Journals: A Retrospective Analysis

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Welcome to another session of Article of the Month, December 2021. Today we discuss a retrospective analysis on women representation as first and corresponding authors in Neuroanesthesiology and Neurocritical care journals. Our commentary is courtesy of Dr. Marie Angele Theard from Legacy Emanuel Hospital in Portland, Oregon.

Dr. Theard completed her residency in Anesthesiology at The University of Illinois in Chicago followed by a fellowship in Neuroanesthesia at Washington University in St. Louis, MO. During my fellowship year in Neuroanesthesia, at Washington University, She developed a keen understanding of the impact of anesthesia on the brain. Research I collaborated on using jugular bulb catheters to measure brain temperature served to deepen my understanding of the metabolism of the brain during administration of anesthetic agents. Examining methods of achieving hypothermia, in brain injured patients expanded my understanding of the role of potentially neuro-protective modalities on the brain.

Currently, Dr. Theard serves as the director of Neuroanesthesia in the Dept. of Anesthesiology here at OHSU where she is trying to strengthen education in Neuroanesthesia with the goal of building a Neuroanesthesia fellowship program. This work is compelling an exploration of ways of improving the educational climate for trainees in addition to cultivating strong collaboration and leadership skills. In an effort to build a more diverse healthcare workforce, She has begun exploring avenues for ensuring more support for our trainees from underrepresented groups in medicine. She has published several articles illuminating the limitations of structural racism in academia and education and understanding the educational environment; conducted surveys on DEI; and hosted workshops examining approaches for eliminating or reducing systemic racism in medical education.

As a member of the Board of Directors of the Society of Neurosciences in Anesthesiology and as a member of SNACC's Diversity, Equity and Inclusion committee, and the SEA's Diversity, Equity, and Inclusion committee, she has hosted conferences focused on how to improve medical training in order to effect more equity and inclusion in medicine. Additionally, as a leader of the WINNER's (Women in Neuroanesthesiology and Neuroscience Education and Research) group of SNACC, she has helped to launch a coaching program for women in SNACC to help them navigate towards

more career satisfaction and leadership opportunities. In an effort to engage Portland's African American community, last year Dr. Theard was awarded a mentorship grant from the American Society of Anesthesiology's Professional Diversity Committee to begin a pipeline project to increase interest among African American middle/high school students for careers in medicine.

As always, we encourage our readers' input on this topic on the SNACC [Twitter](#) feed, or on [Facebook](#).

- Shilpa Rao, MD; Amie Hoefnagel, MD; Oana Maties, MD; and Nina Schloemerkerper, MD

Commentary

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Increased access to quality health care, advancing cultural competency, and promoting trust are a few of the benefits that a diverse health care workforce provides our patients.¹⁻³ Equally important are innovative new scientific discoveries from a broad research agenda fueled by a diverse pool of researchers.⁴⁻⁶ The COVID-19 pandemic together with the rising incidence of neurological disease is necessarily returning attention to the problem of health disparities and fueling needed research to understand the role of inequities in care and to improve neurological outcomes.⁷⁻⁹ As more and more organizations today pursue strategies to improve racial, ethnic, and gender diversity, data is critical for understanding barriers to change. In *Women Representation as First and Corresponding Authors in Neuroanesthesiology and Neurocritical Care Journals: A Retrospective Analysis*, Nidhi Gupta et al. focus on an important group of practitioners and scientists: women in neuroanesthesia, neurocritical care, and neuroscience.¹⁰ The increased incidence of neurological disease is fueling a dramatic expansion in important research which will necessarily require a robust clinician scientist pool. Gupta et al provide us a look at the representation of women authors in 3 neuroanesthesia/neurocritical care journals over the last 5 years (2015-2020) which helps to broaden our discussion on the progress of gender equity and inclusion as well as consider strategies to mitigate barriers to academic success for women in neuroanesthesia and neurocritical care.

While there have been some strides in women's representation in a number of academic specialties like pain medicine, critical care, and anesthesiology, women continue to lag behind men.¹¹ An important charge of academic medicine is authorship with increased attention given to 1st and corresponding authors. The authors of this article include a summary of trends in women authorship in other areas of medicine including anesthesiology which serves as the impetus for examining the visibility of women in neuroanesthesia and neurocritical care. Data presented by Miller et al identified an increase in women representation as first authors in two major anesthesia journals: from 20.5% in 2002 to 30.2% 15 years later. Nevertheless, women continue to be underrepresented as authors when compared to men in this journal as well as in pediatrics, internal medicine, OB/ GYN, surgery, ophthalmology, and otolaryngology journals.¹¹ Gupta et al fills an important gap by providing information about women authorship in academic neuroanesthesia and neurocritical Care. After examining authorship in 3 journals: the *Journal of Neurosurgical Anesthesiology*, the official journal of the Society for Neuroscience in Anesthesiology and Critical Care (SNACC); *Neurocritical Care*, the official journal of the Neurocritical Care Society, and the *Journal of Neuroanesthesia and Critical Care*, the official journal of the Indian Society of Neuroanesthesiology and Critical Care, the authors similarly conclude that women first and corresponding authors are underrepresented. Of the 1,164 authors in this study, men outnumbered women as first authors: 65.4% men were first authors compared to 34.6% women. Similarly, only 29.6% of corresponding authors were women. Most of these articles were special articles (45%) which include consensus statements and clinical guidelines followed by clinical reports (38.9%) and narrative reviews (38.4%) and original research articles with the lowest proportion of woman as first authors at 33.2%. Understanding reasons for these inequities is as important as examining the impact of these conclusions.

Critical to faculty satisfaction in academic medicine are opportunities to participate in education, mentorship, research, and respective medical societies. Original research, independent funding, and publications important for promotion also open doors to presenting at conferences, membership on editorial boards, work as journal reviewers and ultimately provides faculty an opportunity to serve as sponsors for junior and mid-career faculty.^{11,12} In their review of the visibility of

women in academic medicine, Gupta et al provides us some insight into the paucity of women in neuroanesthesia and neurocritical care represented as speakers at conferences and members of editorial boards. In a retrospective analysis of speakers at the Canadian Anesthesiologist's Society Annual Meetings held between 2007 and 2019, compared to perioperative medicine, women were underrepresented relative to men as speakers at a neuroanesthesia symposium and less well represented compared with OB anesthesia and pediatric anesthesia.¹³ While the percentage of women peer reviewers for JNA has increased from 2006 (17%) to 2019 (29%), the editorial board has 20% women which warrants strategies for improvement.¹⁴ Women's preference for more clinical patient engagement over research may explain their interest in writing consensus statements, clinical guidelines and reports as the authors suggest. This may potentially limit their participation as future reviewers of journals and as editors, however, the authors also site evidence of other factors impacting participation. Childcare, unsupportive work environments, and limited role models play a part in limiting academic productivity for women. Results of a series of structured 1:1 interviews with 20 women in medicine who left research early in their career noted additional factors like funding difficulties and an institutional environment described as noncollaborative and biased in favor of male faculty.^{12,15} These challenges impact not only the numbers of women promoted to associate and full professor but may also compromise opportunities for leadership and sponsorship. While the proportion of women faculty has increased at the assistant (46%), associate (37%), and full professor (25%) rank, women continue to represent a majority of faculty at the rank of instructor (58%). In anesthesiology, of the 37% of full time academic faculty who are women, only 18% have been promoted to full professor.^{11,16} Similar trends were noted from data presented in a small survey of SNACC's membership conducted by SNACC's DEI committee: 3% of non-white women at the full professor rank compared to 14% of white men and 12% of non-white men.¹⁷ The 13% of anesthesia chairs in the United States occupied by women speaks to the need for more role models to support opportunities for mentorship and sponsorship for women trainees and faculty.

Gender equity is a global problem reflected in this article focused on women authorship in 3 neuroanesthesia/neurocritical care journals affiliated with international societies. The data presented by Gupta et al is essential for understanding gender inequity in neuroanesthesia/neurocritical care. The increasing representation of women medical school matriculants and the increasing need for more anesthesiologists and intensivists focused on the care of the neurosurgical and neurological patient provides us an opportunity. The downward trend of women medical school matriculants is concerning: from a 51:50 ratio women to men in medical school to 48% of women graduating to 46% of women in residency to 41% of women faculty.¹⁶ More mentorship is needed to support work-life balance at all levels as well as providing opportunities for research and flexibility in structuring career paths in academic medicine. Programs like Women in Anesthesiology, from the ASA, provides a platform to engage women and their experiences in medicine together with networking opportunities. The WINNER's program - Women in Neuroanesthesiology and Neuroscience Education and Research - of SNACC provides opportunities to celebrate women in neuroanesthesia/neurocritical care while addressing barriers to academic success. This year SNACC's WINNERS section has instituted a coaching program for women members of SNACC to help these middle career faculty become more successful in pursuing promotion and opportunities for leadership in academic neuroanesthesia and neurocritical care. The AAMC has instituted annual reports which provide metrics of women in medicine entering the pipeline for use as a benchmark and this summary adds to this needed information for continued assessment to gauge our progress in promoting equity and inclusion to support diversity in medicine.

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