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Future Directions in Sex- and Gender-specific Emergency Medicine

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Abstract

The 2014 *Academic Emergency Medicine* consensus conference “Gender-Specific Research in Emergency Medicine: Investigate, Understand, and Translate How Gender Affects Patient Outcomes” convened a diverse group of stakeholders to target gaps in emergency medicine (EM) sex- and gender-specific research and identify research priorities. At the close of the conference, the executive committee sought feedback from group leaders and conference attendees about the next critical steps in EM sex- and gender-specific research, goals for their own future research, and anticipated barriers in pursuing this research. This article summarizes this feedback on the future directions in sex- and gender-specific research in emergency care and strategies to overcome barriers.

In its 2001 report entitled “Exploring the Biological Contributions to Human Health: Does Sex Matter?” the Institute of Medicine (IOM) called on biomedical researchers to heighten their investigations of sex and gender as critical variables affecting health.¹ More than a decade later, emergency physician (EP) researchers came together at a national research conference to develop consensus on a sex- and gender-specific agenda that would guide research in emergency care for the next decade. Organized around seven key clinical areas relevant to emergency care, the conference represented the culmination of a year of literature review and discussion by work groups.

The consensus proceedings and original research papers in this issue of *Academic Emergency Medicine (AEM)* demonstrate the depth and breadth of the influence of sex and gender on the development and manifestation of disease, response to treatments, performance of diagnostic tests, and provider behavior. It is also increasingly clear that sex and gender affect overall health care utilization. The national health care policy changes

(i.e., the Affordable Care Act and expansion of health care insurance coverage) have begun to affect how patients use emergency resources, and sex-specific differences are already evident in changing patterns of emergency department (ED) utilization. Kozhimannil et al.² reported that enrollment in high deductible health plans has affected men's and women's use of emergency services differently, with men decreasing visits of all severity levels and those involving hospitalizations and women decreasing only low-severity visits. As the number of insured patients continues to rise and to affect how patients use resources and how we deliver care, our charge is to develop expertise in the methods needed to answer the important sex- and gender-specific research questions we have identified.

FUTURE DIRECTIONS

Anticipated Goals

Group leaders and conference attendees were queried at the conference about their thoughts on future directions and obstacles in emergency medicine (EM) sex- and gender-specific research. Twenty-one speakers or group leaders and 45 conference attendees present for the closing session participated. All of the speaker and attendee respondents (for whom it was applicable) indicated that they planned to incorporate sex and gender in their future research. Examples of sex- or gender-related research areas they were considering pursuing as a result of the conference can be found in Table 1. Speakers' and group leaders' opinions about the most important next step in future EM sex- and gender-specific research are listed in Table 2. Main themes revolved around widespread dissemination of the proceedings to raise awareness and to secure funding.

Potential Barriers

The majority of speakers and group leaders and half of the conference attendees felt that an obstacle to the advancement of EM sex- and gender-specific research was inadequate availability of clearly delineated funding. The second most commonly identified obstacle in both groups was making sure that men and women were proportionately represented in studies and that studies were appropriately powered to detect sex or gender differences. Responses about other anticipated obstacles to the advancement of the proposed research agenda can be found in Table 3.

Training opportunities and resources are required to facilitate growth in the area of gender-specific research. In 1999, the Office of Research on Women's Health at the National Institutes of Health (ORWH) initiated three signature programs to advance sex and gender research; the Building Interdisciplinary Research Careers in Women's Health (BIRCWH) program, which funds K12 mentored research programs for clinicians; Specialized Centers of Research to promote interdisciplinary research on sex and gender factors affecting women's health through P50 (specialized training center) grants; and Advancing Novel Science in Women's Health Research, an exploratory (R21) mechanism for extramural investigators interested in all areas of women's health and sex differences research. As of 2010, the BIRCWH program has supported the career development of almost 400 early-stage clinician-scientists at major research institutions in the United States. However, to our knowledge, these opportunities have not yet been engaged by EP researchers.

In a climate of declining funding, researchers must examine a wide variety of federal and corporate sponsorships. The funding panel at the consensus conference, which included representatives from the Patient-Centered Outcomes Research Institute; the National Heart, Lung, and Blood Institute; the Office of Emergency Care Research; and ORWH, highlighted some of these mechanisms available for sex- and gender-specific research.³

Another challenge is “the inconsistent and often confusing use of the terms *sex* and *gender* in the scientific literature and popular press,” as reported by the IOM.¹ EM literature is not immune to this problem and one of the solutions begins with defining the appropriate terminology in our EM literature. Currently, *sex* and *gender* are frequently used interchangeably in scientific writing, often within the same document, with both words referring to whether individuals are biologically male or female.⁴ It has been suggested that sex and gender are associated, but they are not the same; each variable is worthy of study in its own right.⁵ McCarthy et al.⁶ suggest alternatives to strict dimorphism, which makes the matter even more complex. Moving forward, EM researchers, peer reviewers, and editors will need to use the terms “sex” and “gender” more frequently in their scientific writing and establish standards for consistent use of the terms throughout our literature.

Strategies to Overcome Barriers

Our national specialty organizations can play a large role in increasing the national awareness of sex and gender science. The Society for Academic Emergency Medicine (SAEM) can play a key role in providing researchers and educators with up-to-date information in the realm of sex- and gender-specific science. SAEM has taken a lead in promoting gender-specific EM research by supporting the 2014 *AEM* consensus conference on this topic. The society, along with other major physician organizations in EM including the American College of Emergency Physicians (ACEP), American Academy of Emergency Medicine, and the American Board of Emergency Medicine, can continue to further this science by encouraging task forces or interest groups that would allow members to meet, share ideas, and network with others interested in the topic. Such a group would focus on producing educational materials to be incorporated into curricula and didactics, create brief seminars for educators, systematically review and revise EM curricula through a gender lens, create a repository of sex- and gender-specific simulation courses that can be shared across institutions, and incorporate sex- and gender-specific content into existing popular continuing medical education courses. Most importantly such a group will provide an opportunity for like-minded researchers to collaborate and consolidate their ideas and efforts in advancing this field forward in our specialty. We have tasked the SAEM Academy for Women in Academic Emergency Medicine Research Committee with exploring opportunities for such an interest group.

One of the primary aims of the consensus conference was to develop mutual collaborative and networking opportunities for emergency researchers. The vast majority of the participants felt that this goal was achieved.⁷ Fostering such collaborative relationships is essential in pursuing common goals in research. SAEM, ACEP, and other EM national organizations can again take leadership roles in nurturing and formalizing such collaborations.

Other Opportunities for Exploration

The breakout groups were nearly universally challenged to reduce the amount of content they presented and discussed due to the time constraints of the consensus process. This meant that certain areas, even when potentially fundable and highly pertinent to our communities' health and emergency care, were not discussed in the ranking process. We kept the focus of prioritization of questions as pertinent to bedside patient outcomes. This focus did not always allow for outcomes that might be important to the research community or to the nation to be prioritized for the consensus recommendations. For example, a recognizable interest exists on the part of federal funders toward family violence and alcohol abuse as it intersects with elderly trauma patients in the EM setting. The mechanical falls subgroup felt that funders would be interested in global health care dollar savings and community impact if the association of elderly falls and alcohol use and family violence was explored more thoroughly in a gender-specific method. However, when ranked, the corresponding questions were not prioritized when evaluated from a clinical bedside physician's perspective. This illustrates the continued dilemma of ranking from a bedside perspective and ranking from a "best for our community's health care" perspective. Similar questions were raised regarding the clinical bedside implications of basic science research as they were for questions as they related to emergency medical services (vital to public health and disaster response) in trauma and resuscitation. Refinement of proposed guidelines to address these questions should be considered for future discussions on the topic. Another conceptual thread that may deserve further exploration is the complex interaction between the sex and gender of the patient and that of the clinical provider. A subtopic brought forth by the pain,⁸ cardiac,⁹ and trauma resuscitation workgroups,¹⁰ this area likely plays a role in all areas of clinical care and may have merited more detailed discussion and exploration of its relevance in the other breakout groups at the conference. As our specialty matures in the area of sex and gender research, we will gradually be able to deepen our research agenda and expand our work to the many important questions that did not emerge in the forefront in this initial effort.

SUMMARY

The 2014 *AEM* consensus conference provided many opportunities to identify future avenues of sex- and gender-specific research in our field. While significant barriers to successful research were identified, the conference also provided means for overcoming these barriers. The consensus conference aligned our field with national research priorities and allowed us to create a vision for our specialty in the domain of sex- and gender-specific research.

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References

1. Wizemann, TM.; Pardue, ML. Exploring the Biological Contributions to Human Health: Does Sex Matter?. Washington, DC: National Academies Press; 2001.
2. Kozhimannil KB, Law M, Blauer-Peterson C, Zhang F, Wharam JF. The impact of high deductible health plans on men and women; an analysis of emergency department care. *Med Care*. 2013; 51:639–45. [PubMed: 23685403]
3. McGregor AJ, Barr H, Greenberg MR, et al. Gender-specific regulatory challenges to product approval: a panel discussion. *Acad Emerg Med*. 2014
4. Haig D. The inexorable rise of gender and the decline of sex: social change in academic titles, 1945–2001. *Arch Sex Behav*. 2004; 33:87–96. [PubMed: 15146141]
5. Ristvedt SL. The evolution of gender. *JAMA Psychiatry*. 2014; 71:13–4. [PubMed: 24227264]
6. McCarthy M, Arnold A, Ball G, Blaustein J, De Vries G. Sex differences in the brain: the not so inconvenient truth. *J Neurosci*. 2012; 32:2241–7. [PubMed: 22396398]
7. Safdar B, Greenberg MR. Conference on gender-specific research in emergency care--an executive summary. *Acad Emerg Med*. 2014
8. Musey PI, Linnstaedt SD, Platt-Mills TF, et al. Gender differences in acute and chronic pain in the emergency department: results of the 2014 Academic Emergency Medicine consensus conference pain section. *Acad Emerg Med*. 2014
9. Wiggington JG, Perman SM, Barr GC, et al. Sex and gender-specific research priorities in cardiovascular resuscitation: proceedings from the 2014 Academic Emergency Medicine Consensus Conference Cardiovascular Resuscitation Research Workgroup. *Acad Emerg Med*. 2014
10. Sethuraman KN, Marcolini EG, McCunn M, Hansoti B, Vaca F, Napolitano LM. Gender-specific issues in traumatic injury and resuscitation: consensus-based recommendations for future research. *Acad Emerg Med*. 2014 this issue.

Table 1

Examples Participants Gave of Sex- or Gender-related Research Areas They Were Considering Pursuing as a Result of the Consensus Conference

Cardiovascular gender differences.
Gender and psychiatric stressors and pain perception and management.
Pain and gender differences.
Intracranial hemorrhage sex-related differences.
Neurologic emergencies and subarachnoid hemorrhage.
Sex-related differences in opioid interventions.
Patient-centered outcomes.
Race and ethnicity differences in gender in willingness to participate/consent to clinical trials.
Gender differences in out-of-hospital cardiac arrest outcomes.
Patient-centered outcomes for acute coronary syndrome.
Age, sex, and gender differences in concussions and risk factors for post-concussive syndromes in sex and gender disparities groups.
Gender differences in geriatric falls.

Table 2

Most Important Next Step in Future EM Sex- and Gender-specific Research Responses From Speakers and Group Leaders

Create a road map for how EM researchers should consider including gender into their research goals and how to explore new research ideas.
Publish the consensus proceedings and widely disseminate the findings to not only the EM community but to the National Institutes of Health as well (for example the ORWH and to other institute directors).
Align research with the consensus proceedings and use the initiative to apply for funding.
Use this initiative to apply for and promote funding on the topic.
Make sure all researchers include gender stratification; make it a requirement for publication.
Disseminate consensus results so culture changes to realize importance of sex- and gender-specific differences.
Continue collaborations and begin grant writing to answer these questions.
What is the effect of gender/the XY chromosome on the new discipline of synthetic biology?
Comparative effectiveness research on interventions focused on patient-centered outcomes. Intersection between gender and other vulnerable population (e.g., racial/ethnic/minorities/rural populations).
X-linked chromosomal changes and gender-specific outcomes research (like IRAK-1).
Increase awareness and recognition across all research domains.
Wide circulation of proceedings and increased visibility of the topic.
Secure funding and ensure that studies have representative participants to be powered adequately.
Maintain motivation and initiative of the group on this topic.
Train and develop more research scientists.
Increase training and education to boost recognition of clinicians.

Table 3**Obstacles in EM Sex- and Gender-specific Research**

General audience responses
Obtaining funding.
Adequate sample size in studies.
Unbalanced gender breakdown of authors and researchers.
The cost and time to disseminate ideas.
Making sure we look at areas where both men and women have deficiencies in care and not just focus on modifiable variables.
Resistance to change and sticking to the “old way” of thinking.
Marked heterogeneity of population.
Acceptance and implementation of results.
Knowing enough about the topics in non–gender-specific domains.
Inadequate review groups.
EM credibility.
Acceleration of care expectations.
The need for collaboration with other specialties.
There are other important areas that have not had time devoted yet, for instance broadening this important area of research to other diseases (i.e., septic shock).
Lack of education/awareness funding or rubric for the specialty.
Speakers and group leaders responses
Funding, specifically no clear funding line/agency that supports this line of research.
Recruitment of appropriate subjects in adequate numbers to power a study.
Lack of adequate education within the specialty on gender/sex importance.
The paucity of physicians relative to PhDs currently funded and doing research on human subjects.
In concussion research, risk factors for men are different than women as they play different sports with different rules.
Barriers to development of multidisciplinary teams.
It is a new way of thinking and there may be nonbelievers.
Separating issues of comorbidities/age/gender/severity of disease process and genetic differences in outcomes.
Learning a change in practice through standard work.