Stroke

InterSECT

International Section for Early Career and Training

Gender and Sex Equity in Stroke Research, Education, and Care

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The United States has seen a significant increase over the last decade in the number of people who publicly identify as transgender, gender nonconforming, nonbinary, or intersex (TGNCNBI). Recent national surveys estimate that anywhere between 2% and 3% of adults aged 18 to 30 years, 0.5% to 1% of adults aged 30 to 49 years, and 0.3% to 0.5% of adults over 50 years identify as TGNCNBI. With a growing population of TGNCNBI people, there is increased awareness of TGNCNBI-related health issues, including cardiovascular disease (CVD). A 2021 American Heart Association (AHA) Scientific Statement described the individual, interpersonal, and structural determinants of health that contribute to CVD in transgender and gender diverse people and highlighted that the research is limited, particularly for people outside the gender-sex binary.[1] Cerebrovascular disease in particular is largely underexplored and gaps in research, education, and clinical care persist despite the growing awareness of TGNCNBI health.

The majority of medicine operates under a binary understanding of gender and sex, which inherently excludes nonbinary and intersex people. Therefore, there is a need to expand our discussions and actions across all of medicine to be more inclusive. In this article, we outline the current knowledge, existing gaps, and potential solutions for improving gender and sex equity in stroke research, education, and clinical care.

VOCABULARY ACKNOWLEDGMENT

When discussing TGNCNBI health, some vocabulary may be new or unfamiliar to some readers. As such, we have provided definitions for terms as we use them in this article (Table). Further, we must acknowledge that lesbian, gay, bisexual, transgender, queer/questioning, intersex, asexual, and other related identities (LGBTQIA+) individuals may define these terms differently for themselves than from any scientific standard.

GAPS IN RESEARCH

The 2021 AHA Scientific Statement addressed some of the current research gaps in stroke and cardiovascular health in transgender people.[1] However, this statement does not review research gaps relating to gender nonconforming, nonbinary, or intersex folks, likely due to the limited data available. Much of the current literature has focused on transgender people, with disproportionate focus on specific topics, including HIV, hormone use, substance use, and mental health outcomes.

Another key limitation in research is the lack of standardized capturing and reporting of inclusive gender identity in clinical and research settings. It is not yet standard practice to record gender identity and pronouns in the electronic health record. Additionally, there is a lack of gender identity collection in population health surveys, and those that do, for example, the Behavioral Risk Factor Surveillance System and the Youth Risk Behavior Surveillance System, collect gender identity in optional modules. Existing cerebrovascular research, therefore, relies on small, observational studies with high risk of bias, and predominantly describes vascular health in binary transgender people.

Key Words: adults ■ cardiovascular disease ■ cerebrovascular disease ■ stroke ■ transgender

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Table. Glossary of TGNCNBI Terminology[2,3]

Binary (n, adj)	Refers to the idea that there are only 2 identities (female/male and woman/man); often erroneously used to discuss issues of sex and gender in dominant society
Cisgender (adj)	Having a gender identity congruent with one's sex assigned at birth
Endosex (adj)	Having natal sex characteristics (chromosomes, gonads, sex hormones, and/or genitals) that fit a male/female binary
Gender (n)	A social construct used to classify someone as a man, woman, nonbinary person, etc
Gender expression (n)	One's external communication of gender, for example, speech, mannerisms, clothing, etc
Gender identity (n)	A person's internal sense of gender
Gender, nonconforming (adj)	Expressing gender in a way that does not align with the socially prescribed roles and behaviors of one's gender identity. People of any gender can be gender nonconfirming
Intersex (adj)	Having natal sex characteristics that do not fit a male/female binary. Formerly having a disorder of sexual development or hermaphrodite
LGBTQIA+ (adj)	Lesbian, gay, bisexual, transgender, queer/questioning, intersex, asexual, and other related identities
Nonbinary (adj)	Having a gender identity outside of a man/woman binary. Not all nonbinary people identify as transgender. Sometimes referred to in the literature as gender diverse
Sex (n)	Combination of natal biological characteristics used to categorize individuals as male, female, or intersex
Sex assigned at birth (n)	A label usually based on phenotypic presentation of an infant to categorize them as male, female, or intersex
Transgender or trans (adj)	Having a gender identity that is incongruent with one's sex assigned at birth. Formerly transgendered or transsexual

TGNCNBI indicates transgender, gender nonconforming, nonbinary, and intersex.

Lastly, it is important to recognize that much of the literature has focused on the use of gender-affirming hormone therapy and its association with ischemic stroke. Although gender-affirming hormone therapy is important, there are limitations to this focus: (1) these studies miss the portion of the community that does not use hormones; (2) they often do not include the type/formulation of hormones, each of which have their own unique risk profile and change over time, so critical comparison to current hormone regimens is limited; and (3) they may bias researchers and clinicians to focus on the risk of hormones rather than examining the full picture of risk, including social determinants of health, which may actually be more relevant to CVD. Specifically, there is limited research on how allostatic load, a measure of physiologic dysregulation due to stress (disease-mediated stress and psychosocial stress), contributes to stroke risk and outcomes in TGNCNBI populations. Similarly, few studies explore the contribution of weathering, the concept that chronic exposure to social and economic disadvantages can explain disparities in minority groups.

GAPS IN EDUCATION

Undergraduate clinical education has become more supportive of TGNCNBI folks; however, this progress toward inclusion is not consistent between institutions. Between the limited exposure to TGNCNBI health education and use of outdated vocabulary, there are several barriers impeding further progress toward a gender- and sex-inclusive healthcare system.

A 2011 study found most medical schools only provided 4 to 5 curricular hours to issues pertaining to LGBTQIA+ individuals.[4] Topics that have relevance to CVD in TGNCNBI people, such as substance use, chronic disease risk, gender-affirming care, body image, and transitioning, were taught in <40% of schools. Since 2011, there has been a small increase in the number of transgender focused standardized cases and short-term curricula during preclinical or clerkship years, but many are not inclusive of nonbinary and intersex people, nor is TGNCNBI health integrated throughout the overall curriculum. To our knowledge, there are no publications describing curriculum addressing stroke and CVD in TGNCNBI people.

Another important gap to address in clinical education is the use of outdated vocabulary when introducing TGNCNBI concepts and terminology. Both TGNCNBI trainees and patients frequently need to explain how to care for TGNCNBI people or interact with TGNCNBI colleagues. Much of this can be attributed to a lack of LGBTQIA+ clinical education when the current faculty and preceptors were trainees and lack of required LGBTQIA+ content in continuing medical education.

GAPS IN CLINICAL CARE

There exist many gaps in the stroke care of TGNCNBI people, including, but not limited to, structural barriers to care (eg, experiences of discrimination) and insufficient evidence to guide equitable clinical practice (eg, management of gender-affirming estrogen after stroke).[3] Literature suggests that transgender people taking estrogen-based hormone therapy have a higher incidence of stroke and thromboembolic events compared to cisgender people, which has been attributed to the prothrombotic effects of estrogen. Additional reported stroke risk factors among transgender

people include disproportionate prevalence of prior strokes, transient ischemic attacks, tobacco use, stimulant use, tobacco use, hepatitis C, and HIV. However, the validity of the current data is limited due to study design (retrospective, lack of randomization) and small sample size. The reported prevalence for common stroke risk factors such as hypertension, dyslipidemia, and hyperglycemia is mixed, raising the possibility of overgeneralization in such a diverse population with unique lived experiences, stressors, socioeconomic status, and access to care. TGNCNBI people experience higher unemployment, homelessness, and have lower income compared with their endosex, cisgender counterparts. Transgender people may also have a lower likelihood of having a primary care physician or health insurance,[3] impacting stroke risk through disparate primary prevention.

POTENTIAL SOLUTIONS

Systemic changes in how to incorporate sex and gender in research, education, and clinical care are needed. Limited attention has been given to cardiovascular health in TGNCNBI people, despite CVD being the first and stroke the fifth cause of death in the United States.[3] Hence, more research is needed on vascular risk factors, disease mechanisms, and outcomes across TGNCNBI populations. The 2 AHA Scientific Statements pertaining to transgender and gender diverse and gender- and sex-related differences in CVD and endovascular treatment, respectively, offer hope for increased prioritization of TGNCNBI people in research and for the development of TGNCNBI CVD cases and curricula.[1,5]

With more young people publicly identifying as TGNCNBI, there will be more TGNCNBI people entering health care professions and accessing health care. We need to shift the way we conceptualize interacting with TGNCNBI people as something to be integrated into health care standards rather than entirely distinct from how to interact with cisgender people. A quick and effective initial solution is to adjust the language used starting in preclinical training to be gender-neutral and organ-specific. For example, instead of saying postmenopausal women are at higher risk for stroke, one could say menopause, whether natural, surgical, or pathological, increases a person's risk of stroke. In one statement, we can be specific that it is the condition of menopause that increases stroke risk, rather than gender, as well as include anyone whose ovaries are no longer functioning or present. This approach will enable clinicians to promote more inclusive health care, for people of any gender or sex, and will open the door for exploring potential conditions and experiences unique to TGNCNBI people in fundamental learning environments.

Information about TGNCNBI people needs to be integrated into clinical education for current providers as well. A 2019 survey of neurologists showed only 54% of respondents knew that particular stroke risk factors were more prevalent in sexual and gender minority populations.[2] Clinician education could include required continuing medical education, national conference workshops, Grand Rounds focused on stroke care of TGNCNBI people, or leveraging existing resources from organizations such as the National LGBTQIA+ Health Education Center and GLMA: Health Professionals Advancing LGBTQ Equality.

In clinical care settings, it is imperative that people can identify with their health care providers. Recruitment of sex and gender diverse stroke clinicians is crucial. Neurology residency and stroke fellowship programs should prioritize the training of a diverse workforce by creating safe spaces for TGNCNBI persons during recruitment, incorporating gender diversity as a curricular goal, and ensuring their training programs are safe and inclusive for TGNCNBI individuals. A balance should be achieved between allyship and promoting a safe environment with not outing providers or applicants who do not feel ready to disclose. Therefore, recruitment strategies that center sex and gender diversity should be ubiquitous, incorporated into the standard recruitment strategy and curriculum, and intersectional with issues related to race/ethnicity, disability, and other identities.

Barriers to equitable stroke care continue to be multifactorial. Fear of discrimination contributes and may be addressed with the aforementioned interventions; however, socioeconomic factors cannot be ignored. Stroke providers should partner with social work and case management to incorporate appropriate social interventions and forge partnerships with organizations that support TGNCNBI people in the community. Patient intake forms and the electronic health record should include pronouns and all aspects of sex/gender identity, if the individual chooses to disclose. If health care providers feel comfortable, they should prominently display their pronouns to signal respect for gender diversity. Clinical reasoning should avoid using sex and gender in isolation to narrow differential diagnoses, knowing that past research informing these heuristics do not include TGNCNBI populations and could exacerbate existing disparities.

CONCLUSIONS

There are limited data on the epidemiology of stroke and risk factors among people who identify as nonbinary and intersex, with the majority of that data focusing on binary transgender individuals. Current opportunities for improvement include the following: (1) structural-level interventions across EHRs, national research

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databases, and research cohorts to standardize the collection of gender identity and pronouns; (2) funding randomized and/or longitudinal studies to better understand causality of risk factors and outcomes of stroke in TGNCNBI people; and (3) prioritizing community engagement, advocacy, and clinical education to promote mutual understanding and trust.

ARTICLE INFORMATION

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