

Gender Inequity in Neurological Health Care in India: Socio-Cultural Influences, Clinical Challenges, and Potential Pathways to Equity

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ABSTRACT

The issue of gender-based inequity in health care, particularly in neuromedicine, is indeed a matter of serious concern in India. From birth, girls often face discrimination, which can manifest in malnutrition, unequal access to education, and inadequate health care, all of which impact their neurological health. Neurological conditions such as epilepsy, stroke, psychosomatic disorders, and demyelinating disorders reveal stark disparities in diagnosis, treatment, and care based on gender. Key factors contributing to this gender-based inequity in neuromedicine are socio-cultural barriers (deep-rooted societal norms and cultural practices in India often prioritize the health of male family members over females. These norms can result in women delaying seeking medical attention or being denied care altogether. This contributes to late diagnoses and poor outcomes for women with neurological conditions; myths misconceptions and misbeliefs (neurological disorders, particularly epilepsy and psychosomatic disorders, carry significant stigma, especially for women). Misconceptions around conditions like epilepsy can lead to social isolation, exclusion from marriage prospects, and neglect in care. Additionally, women's health issues are often dismissed as psychological or "hormonal", leading to misdiagnoses; access to health care (women often face structural barriers, such as lack of autonomy in decision-making, lower financial independence, and restricted mobility), which limit their access to neuromedical care. Health care resources in rural and underserved areas are limited, and gender biases in treatment mean that women are less likely to receive timely and adequate interventions for neurological conditions; malnutrition (poor nutrition among women), starting from childhood, is a significant contributor to neurological health problems. Malnutrition during pregnancy, which affects fetal development, can result in a higher prevalence of developmental neurological disorders in children, with gender-based neglect often continuing into adulthood. Potential solutions include awareness campaigns, policy changes, health care provider training, and community empowerment. By delving into these areas, we can begin to understand the complexities of gender inequity in neuromedicine and work toward more equitable health care solutions.

Keywords: Gender inequity, socio-cultural norms, financial independence, cultural beliefs, LGBTQ health, societal oppression, transgenerational concepts

GENDER-DEPENDENT HEALTH CARE INEQUITY IN NEUROMEDICINE IN INDIA: A PATIENT'S PERSPECTIVE

The Concept of Gender

In medical research, the distinction between "sex" and "gender" is crucial. While "sex" refers to biological characteristics, "gender" encompasses multidimensional facets with diverse determinants like societal roles, behaviors, and expectations shaped by the social environment. Factors like socio-cultural basis, traditions, ethnicity, parenting, role playing, responsibility acquisition, and financial influence have impact on gender spectrum. Biological characteristics are the most important determinant of sex, while gender includes a broader spectrum encompassing male, female, and transgender. In India, gender is constructed through a

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rigid patriarchal lens that positions men as the primary decision-makers and providers, while women are relegated to subordinate roles. This imbalance manifests starkly in health care, particularly in neurology, where women's access to medical care is often hindered by socio-cultural norms and economic dependence on male family members. It is important to consider that gender roles influence health-seeking behaviors, access to care, and health outcomes, especially in neurological conditions that are under-recognized in women, such as epilepsy or migraines¹⁻³.

Determinants of Gender

Pubertal endocrinal influence along with changes in psyche as a result of traditions, transgenerational concepts, responsibility discrimination, parenting role identification, and socio-cultural impact prepare individuals to develop the idea of self-identification, and at the same time individuals start following the socio-culturally pre-structured and accepted norms, which are the most important gender constructs. Recent research has shown variation of some brain regions based on gender differences. Researchers have found that the right hemisphere, and particularly the right caudal anterior cingulate, right medial orbitofrontal, and left lateral occipital cortex, presented no differences or even thicker regional cortices in women compared to men in gender-equal countries, in contrast to thinner cortices in countries with greater gender inequality⁴⁻⁶. "Multi-deterministic" and "multi-dimensional" concept of gender often have differences based on socio-cultural norms, regulations, and financial background, which may lead to gender inequity in various aspects of life including health care⁷. This suggests that the brain itself can adapt to social environments, and chronic exposure to inequality may shape neurological health. Thus, the interaction between social factors and biology is vital to understanding the gendered nature of neurological health.

The Indian Scenario

India has enormous socioeconomic and socio-cultural diversities and though it is considered as a developing country, a significant proportion of the total population, unfortunately still have low educational attainment. As a result, transgenerational concept of roles, responsibilities, and traditional expectations propagate along with myths, misconceptions, taboos, religious beliefs and rituals, which have strong impact on self-identification and gender identity resulting in marked differences between genders, which ultimately leads to gender

inequity^{8,9}. Despite having robust cultural heritage and history of struggle in favor of gender equity in the past in India, several socio-cultural, political, financial differences, and traditional beliefs continue to propagate gender discrimination. Stemming from these factors, gender inequity still prevails in our country, skewed in favor of 'male-dominant society' at large. The glorified struggle of 'cultural renaissance' in the past partly changed the dynamic note in favor of equity; however, it still fell short to address the actual needs¹⁰. Traditions and financial issues are the two most important considerations in this aspect. From health-care access to availing health-care facility, the differences are stark and disadvantageous for females and marginalized genders in India till date and alarmingly most of the time it pivots around the financial construct of the family¹¹. India's health care system reflects the country's larger socioeconomic inequalities, with marked differences in access to care between urban and rural populations, as well as between men and women. In rural areas, where 70% of India's population reside, health care infrastructure is often inadequate, with fewer neurologists, limited diagnostic facilities, and poor access to essential medicines. Compounding this is the fact that rural women have less education and lower financial autonomy, which makes it difficult for them to seek timely medical care. Patriarchal values further restrict women's ability to prioritize their health. In traditional Indian households, women are often seen as caregivers and are expected to put the needs of their family before their own. This leads to delayed medical intervention for neurological conditions, as women may avoid seeking care due to financial constraints or fear of societal judgment. The situation is especially dire for neurological disorders, where early diagnosis and intervention are crucial for preventing long-term complications. Authors, herein, want to depict the differences in health-care access, family support, availability of health-care, and home-care of 'diseased' depending on gender differences in neurological disorders, which is most often crippling and demands utmost care and equity at large.

Is Gender-Based Inequity Evident?

Based on the traditional expectations and socio-cultural belief system, most of the Indian females still do not have financial independence, which impedes them from taking independent decisions. Most of the Indian females have to depend on the male earning family members for their livelihood. Indian females, out of traditions and age old beliefs, manage every day household activities and homemaking in an efficient

way and by virtue of their biological capability females carry, potentiate, and propagate family. However, due to lack of financial independence, most of the time their roles, responsibilities, and contributions are undermined and taken for granted. The greater responsibilities of the females in our society are often neglected and overshadowed by compulsive and rigid societal norms and rituals. Majority of the females in our society have to rely on their male earning members of the family for their health care, which forms the basis of inequity¹².

Delving deeper, authors intend to bring out the striking inequity in health care issues regarding neurological disorders, pivoting on heterogeneous and multiple factors ranging from gender inequity to disease characteristics *per se*, in Indian backdrop based on more than 10 years of working experience in this field.

Inequity and Neuromedicine: From Birth?

Authors made an informal, unstructured interview of a fair number of caregivers visiting the Neurology inpatient department (IPD), outpatient department (OPD), and the special clinics (Stroke clinic, Epilepsy clinic, Demyelination clinic, and Neuromuscular clinic) of the largest tertiary Neurology Care Center in eastern India. It was observed that a substantial number of caregivers expressed their concerns that for any neurological ailment of the child, mother is considered responsible for the disease, irrespective of the nature of disease. Nearly 50% of the caregivers had the opinion that 'taking care of illness' is the primary responsibility of females. In India, mothers from poor socioeconomic strata are often criticized by close family members on giving birth to female child. These differences are more overt in rural areas with poor socioeconomic status. The scenario in the higher socioeconomic status and in urban backdrop was also somewhat similar. However, the gender inequity is more subtle in urban population with higher socioeconomic status. Though, females (mothers) have nothing to do in gender determination of their offspring and at the same time are not always responsible for genetic neurological disorders, still majority of family members most often make females (mothers) responsible for any sort of neurological disorder and psychiatric ailment in family. In India, malnutrition and poor awareness of pregnancy-related adverse events, especially in females hailing from rural poor socioeconomic status, are still quite prevalent. As consequences, birth asphyxia and related hypoxic injury of neonates are common. Not uncommonly, mothers are made responsible for adverse pregnancy outcome, though poor awareness, delayed health care

facility seeking behavior, and neglect by husband/father (male members of the family) are the most crucial determinants. However, these are most frequently overlooked, paving the path for wider gender inequity. Often Indian females have to depend on the earning male members of the family for nutrition and care in pregnancy and lactation. To worsen the situation further, this care is mostly below par, especially in economically constrained community and in families with low educational reserve. This augments the sufferings of the females, ultimately leading to various catastrophic consequences affecting both the mother and child and society at large. Any acquired or genetically determined neurological and psychiatric disorders in females are diagnosed late, and most of the time it has been observed that there is a substantial delay between the onset of disease and first health care access¹³⁻¹⁸.

Despite advances in medical care, the inequity in health service access between men and women is undeniable in India. Women, especially in rural areas, often face significant barriers in obtaining neurological care. Gender-based discrimination plays a pivotal role in the delay of diagnosis and treatment of neurological disorders in women. Conditions like epilepsy, stroke, and psychosomatic disorders, which require immediate attention, are often ignored or under-diagnosed in women, leading to poor health outcomes. Socio-cultural myths, such as viewing seizures as divine punishment or psychosomatic disorders as mere attention-seeking behavior, exacerbate these issues. Women who are financially dependent on male relatives may have little control over health care decisions, further delaying medical intervention. This systemic neglect is not just a reflection of health care inequity but a broader societal disregard for women's health, where their symptoms are often minimized or overlooked altogether.

GENDER INEQUITY IN NEUROLOGICAL CONDITIONS

Epilepsy

Epilepsy serves as a powerful example of the ongoing gender disparity in Neurology. In India, the stigma surrounding epilepsy disproportionately affects women, particularly in rural and traditional families. Women with epilepsy often face discrimination in marriage, with many potential suitors withdrawing once they discover the woman's condition. This fear of social ostracization leads to families concealing their daughters' epilepsy diagnoses, delaying appropriate medical treatment. Epilepsy in females is still a social stigma in several countries including India. Epilepsy management is

difficult especially in females due to suppression of facts by family members, which may be due to the fear of being isolated from society, stigma, taboo, difficulty in arranging marriage for female patients with epilepsy and/or due to the poor awareness. Noncompliance to antiepileptic drugs (AEDs) is very common due to poor financial support from the family members. The societal perception of epilepsy and dissociative attacks are similar. Family members often try to trivialize the issue by attributing the event to non-specific weakness or influence of supernatural power or God. Further, they seek help from traditional health care workers (quacks). Ignorance, low educational attainment and inequity further complicate the issue. Marriage is quite difficult in female patients with epilepsy in India. This stems from the prevalent general notion that epilepsy runs in the family and possibility of having epilepsy in child/children is inevitable when the mother has epilepsy. Due to the fear of criticism from in-laws and resultant disharmony and psychological stress, there is often a tendency to discontinue AEDs after marriage resulting in breakthrough seizure. Alternatively, some continue to take AEDs secretly, unmonitored and without medical consultation, consequently when pregnancy happens, often AEDs are continued without necessary modifications, augmenting the possibility of fetotoxicity¹⁹.

Idiopathic Intracranial Hypertension and Cerebral Venous Sinus Thrombosis – Sexual Independence: An Enigma?

In the rural areas of India, females have very little sexual independence as well. This majorly results in giving into the wishes of male partner. Furthermore, they are often compelled to use measures of contraceptions that might not be ideally suited or in some cases harmful to them (commonly oral contraceptive pill [OCP]), respecting the wishes of their male partner. We have observed several related health issues in females due to this previously mentioned factor, like fatal idiopathic intracranial hypertension (IIH) and/or cerebral venous sinus thrombosis (CVST), which again was diagnosed late due to poor perception, awareness, and concern. Male partner often seems to be reluctant to use barrier method of contraception in few areas of our country because of various taboos, misconceptions, and poor educational reserve, which may herald life-threatening sexually transmitted diseases and unplanned pregnancies.

Stroke

In India, stroke is a significant cause of morbidity and mortality, and gender disparities in stroke care are

well-documented. Studies suggest that women are less likely than men to receive timely intervention, even though they experience higher stroke severity and poorer outcomes. Women often delay seeking care due to cultural beliefs that downplay the seriousness of symptoms like dizziness, headache, or weakness, which are commonly dismissed as stress-related or hormonal. Moreover, after a stroke, women are less likely to be referred for rehabilitation services, which are essential for recovery.

Caregiving responsibilities further impede their ability to attend follow-up appointments or engage in rehabilitation exercises, as their role as caregivers continue to take precedence, even in the face of serious neurological conditions.

Demyelinating Disorders

Picture of gender inequality is mostly reversed when we focus on patients with multiple sclerosis (MS), a primary demyelinating disorder, characteristically more common in females. MS being primarily a disease of higher socioeconomic status, the margin of inequity between genders is much narrow. Here, most of the female patients are aware of their disease state, availability of health care facility and can take independent decision regarding treatment. Financial stability and higher educational background are the two most independent factors responsible for this. Though MS patients are predominantly young females, however, hailing from higher socioeconomic status and we rarely observe inequity in terms of health care seeking attitude, family support, and treatment continuation.

In contrast, the burden of somatization, somatoform pain disorders, depression, and anxiety in young/middle-aged females from lower socioeconomic strata indirectly argue in favor of ongoing inequity, poor lifestyle, and faulty coping strategies of the females in the families with negligible support and presence of oppression. Intertwined with socioeconomic condition, especially in rural areas, gender-based oppression (females often being in the receiving end of it) coupled with age old traditional thoughts and responsibilities pave the way for gender inequity in different spheres of mental health related issues in females.

SEXUAL AND REPRODUCTIVE HEALTH IN NEUROMEDICINE

Pregnancy and Neurological Health

Prevalence of malnutrition and hypoxic ischemic encephalopathy in newborn children are the two most

important reflectors of poor women's health during pregnancy. Neurological events during pregnancy are often ignored by family members and remain undiagnosed and untreated. Family members usually consider any neurological problem in pregnancy as weakness or vitamin deficiency driven by lack of knowledge and traditional thoughts prevalent in rural India. Appropriate health care system to address these special issues is also lacking in this regard.

Ischemic or hemorrhagic strokes due to inappropriate blood pressure and glycemic control are not uncommon. Pregnancy related unique issues like posterior reversible encephalopathy syndrome, reversible cerebral vasoconstriction syndrome, CVST, IIH, first attack or recurrence of attack/s in neuromyelitis optica spectrum disorder and anti-myelin oligodendrocyte glycoprotein antibody disease, convulsions related to eclampsia and/or breakthrough seizure in females with history of epilepsy are also often poorly recognized by family members as well as by health care personnel as there is dearth of specialized centers in rural India till date. Guillain-Barre syndrome, myasthenic crisis, myelitis, and hypokalemic paralysis often remain under-recognized and undiagnosed in pregnancy claiming lives. Pregnancy introduces a unique set of challenges for women with pre-existing neurological conditions or those who develop neurological complications during pregnancy. In rural India, where access to prenatal care is limited, these conditions often go undiagnosed until they result in severe outcomes such as stroke or permanent neurological damage.

Moreover, societal expectations surrounding pregnancy and motherhood often prevent women from seeking medical care for neurological conditions, as they fear being blamed for adverse outcomes. Women who experience miscarriages, stillbirths, or neonatal complications such as hypoxic-ischemic encephalopathy in their infants may be stigmatized and blamed for the child's condition, even when the cause is unrelated to maternal behavior. Unfortunately, female child is still unwanted in rural India based on socio-cultural beliefs, financial instability, low educational attainment, religious misperceptions, misconceptions, and taboos.

Strong legislations have been in place to mitigate this issue, still its utility lags far behind the desired results. Females are often criticized by family members for giving birth to female child, affecting the mental well-being of mother, further augmenting the possibilities of depression/postpartum blues/postpartum psychosis, or may lead to unmasking of various latent psychopathologies in mothers.

Most of the time mothers are held responsible for any disease/adverse life-related events of their children, which lead to mounting of guilt in the mother. These inequities are sometimes more obvious in postpartum period. Poor socioeconomic condition, responsibilities based on prefixed socio-cultural norms and regulations, poor nutrition along with postpartum mood changes and lack of family support not only render the mothers helpless but also widen the gender dependent gap of inequity. Moreover, in country like India, reproductive rights of women hailing from poor socioeconomic section and low educational reserve are ignored and often not practiced in family. Sexual rights, will and independence are often criticized at the cost of husband's intention, planning and motive, further make inequity obvious and overt.

Contraceptive Choices and Neurological Health

The misuse of OCPs is another significant factor in the neurological health of women in India. In some regions, OCPs are used without medical guidance, increasing the risk of conditions like CVST and IIH. Women are often pressured into using contraception without proper counseling regarding the risks and benefits, leading to adverse health outcomes. In the absence of adequate health care access, these conditions may go undiagnosed until they result in severe complications. The lack of autonomy women face in making reproductive health decisions is a significant factor in these outcomes. Decisions regarding contraception are often made by male family members or dictated by societal norms, further limiting women's control over their health. The result is a health care system that is reactive rather than proactive, addressing neurological conditions only when they have reached critical levels.

Gender Disparities in Neuroinfectious and Neuroinflammatory Disorders and Caregiving for Chronic Neurological Disorders

Our observations about neuroinfectious diseases in females, particularly in rural India, unfortunately highlight inequality to even greater degree. This is evidenced by higher proportions of late diagnosis and more frequent complications, morbidity and mortality among females due to lack of awareness, negligence, poor family support, paucity of empathy towards the females. And they further fuel the inadequate follow-up and poor compliance to the therapy widening the prevalent inequality.

Connective tissue disorders (systemic lupus erythematosus, Sjogren's syndrome, rheumatoid arthritis, and

sarcoidosis) related neurological complications are more common in females in line with the gender predilection of these diseases. However, this may also be a reflector of poor family care, support, inappropriate specialized health care access, and also a consequence of late diagnosis. India is a country of high religious diversities where gender inequity stems from traditional thoughts, transgenerational propagation of misconceptions, taboos, group/herd religious beliefs, rituals, and distorted ideas on gender-dependent responsibilities and roles. All these factors critically hinder the attainment of desired health-care equity.

It has also been commonly observed that when a female member of the family suffers from chronic neurological ailments like dementia, Parkinsonism or other degenerative neurological disorders, there are fewer caregivers around, in sharp contrast to their male counterparts where females of the family are usually engaged in caregiving. It is also seen that family members of the admitted female patients (in neurology indoor) are often lesser in number, less anxious, and more agreeable on disease-related adverse outcome during communication session by treating neurologists regarding the patient's status. Most of the time, family members are unaware about the course of the disease or symptoms of their patients (females) prior to hospitalization²⁰.

LGBTQ+ and Gender Minorities in Neuromedicine

LGBTQ+ individuals often face unique challenges related to neurological care, including access to mental health support, hormonal therapy, and surgery-related complications.

For example, transgender individuals undergoing hormone replacement therapy are at a higher risk for conditions such as venous thromboembolism, which can increase the risk of stroke or CVST. Yet, there is limited research and clinical guidance available in India for health care providers treating neurological conditions in LGBTQ+ individuals. The intersection of discrimination, stigma, and a lack of tailored health care services often leads to delayed diagnosis and treatment of neurological conditions in LGBTQ+ individuals. Furthermore, they face higher levels of mental health disorders, such as depression and anxiety, which may exacerbate the symptoms of underlying neurological conditions. Unfortunately, many LGBTQ+ patients avoid seeking care due to fear of discrimination and mistreatment by health care professionals, perpetuating a cycle of neglect²¹.

ADDRESSING GENDER INEQUITIES IN NEUROMEDICINE

Policy-Level Interventions

To address the pervasive gender inequities in neuro-medicine in India, systemic changes at the policy level are essential. The government must prioritize the development of gender-sensitive health care policies that recognize the unique needs of women and LGBTQ+ individuals. Increasing funding for public health programs that focus on neurological health is crucial, especially in rural areas where resources are limited.

Policies must also aim to train health care providers to recognize and address gender bias in their clinical practice. Medical education curricula need to be revised to include training on gender differences in neurological conditions, as well as the social determinants of health that affect women's and gender minorities' access to care. This training will empower health care providers to deliver more equitable care and reduce diagnostic delays for conditions like epilepsy, stroke, and demyelinating diseases.

Community-Based Programs

Community-based interventions are essential to addressing the cultural and societal barriers that prevent women from seeking neurological care. Public health campaigns should focus on dispelling myths surrounding neurological conditions, such as epilepsy, and promoting early intervention for women and gender minorities. These programs should target rural areas, where access to information and health care services is often limited. Furthermore, engaging local communities in the development and delivery of these programs can help to create culturally appropriate and sustainable interventions. Involving women's groups and local leaders can help to shift societal attitudes toward women's neurological health and encourage families to prioritize health care for women and girls.

Empowerment and Education

Education plays a pivotal role in addressing gender inequities in health care. Empowering women with knowledge about their own neurological health, including the importance of early diagnosis and treatment, can help to overcome some of the socio-cultural barriers they face. Educational programs should be tailored to different literacy levels and delivered in local languages to ensure they reach the widest audience possible. Additionally, providing women with greater financial independence through employment and

microfinance programs can help to reduce their dependence on male family members for health care decisions. Financial autonomy gives women the power to seek medical care when needed, improving their overall health outcomes.

Improved Access to Health Care

Access to health care must be improved, particularly in rural areas, where women face significant barriers to receive neurological care. Strengthening primary health care services and integrating neurological screening and treatment into existing maternal and child health programs can help to ensure that women receive timely care. Moreover, mobile health clinics and telemedicine services can be used to bridge the gap between rural communities and specialized neurological care. These services can provide women with access to neurologists and other specialists without the need for long-distance travel, which is often unaffordable for families living in poverty.

CONCLUSION

Biologically acquired masculinity, physical prowess, financial independence, socio-culturally and traditionally gained roles and responsibilities (claimed to be superior by males) make the males “pseudo-superior”. This concept is spread transgenerationally based on socio-cultural misconceptions and misbeliefs, paving the path for gender inequity. Inequity in health care is quite prevalent in India. The various angles perpetuating the gender inequities in health-care service have been critically appraised (neurologist’s perspective). Discrimination in roles and responsibilities between genders, imparting extra importance on financially productive works and by making financially driven issues priority (socio-culturally acceptable male work pattern) than natural, homemaking and creative works (socio-culturally acceptable female work pattern) has led to males establishing their pseudo-supremacy, which is also reflected in health care-related issues. Sexual dominance by masculinity rather than love and will speaks against equity. Financially productive works are nested in people’s mind as real (valuable) whereas homemaking, care, sustaining integrity in families are often ignored, devalued, and considered less important. Inequity becomes more evident when power, finance, and crude sexuality take upper hand over nature, creation and love, and when higher order emotions become less prioritized than crude emotions. The authors herein believe that solution lies in education and financial independence/stability of

females and marginalized genders. Mere policy making would not be beneficial, without proper execution, implementation, and monitoring of the policies. Strong legislations and strict adherence to combat against societal oppression and violation of basic rights should be strictly maintained. Breaking the tradition of gender based taboos and socio-cultural beliefs/norms by uplifting societal cognitive values and abilities towards gender equity are of essence. Appropriate infrastructure development to cater to the specialized issues for females and marginalized genders are the need of the hour. Financial constraints must not be the barrier for raising awareness for equity and provision for equal health care facility.

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