Disparities Across Sexual Orientation in Migraine Among US Adults

Migraine affects 1 in 6 adults and represents the fifth leading cause of emergency department visits in the US. Despite an increasing recognition of disparities in migraine prevalence by race/ethnicity, sex, and socioeconomic status, there is a paucity of research on disparities by sexual orientation. Sexual minority groups (eg, lesbian, gay, bisexual, and other nonheterosexual people) may experience unique discrimination, stigma, and barriers to health care access, thus leading to disparities in physical and mental health. The objective of this study was to determine the association between sexual orientation and migraine in a nationally representative sample of US adults.

Methods | Cross-sectional, nationally representative data of US adults ages 31 to 42 years old from Wave V (calendar years 2016-2018) of the National Longitudinal Study of Adolescent to Adult Health (Add Health) were analyzed from May 2020 to June 2020. The University of North Carolina institutional review board approved all study procedures, and written informed consent was obtained from all participants.

Migraine was measured based on self-report in response to the interview question, “Have you ever had five or more headaches that were at least four hours long; one-sided, pulsating, intense, or worsened by activity; and associated with nausea, vomiting, or sensitivity to light or sound?” which was consistent with the International Classification of Headache Disorders, third edition diagnostic criteria for migraine without aura. Sexual orientation was categorized into 3 categories: exclusively heterosexual; mostly heterosexual but somewhat attracted to people of one’s own sex; or lesbian, gay, or bisexual, as has been previously categorized. Logistic regression analysis was conducted using Stata version 15.1 (StataCorp) with sexual orientation as the independent variable and migraine as the dependent variable, adjusting for sex, race/ethnicity, age, education, income, smoking, and alcohol use and incorporating national sample weighting.

Results | The diverse and representative sample consisted of 9894 adults, with a mean (SE) age of 37.33 (0.12) years, of whom 51.0% (n = 5705) were women and 49.0% men (n = 4189). Participants identified as exclusively heterosexual (n = 8426 [85.8%]), mostly heterosexual (n = 1062 [10.0%]), or lesbian, gay, or bisexual (n = 406 [4.2%]). The prevalence of migraine was higher among individuals who reported being mostly heterosexual (n = 327 [30.3%]) and lesbian, gay, or bisexual (n = 112 [30.7%]) compared with those who reported being exclusively heterosexual (n = 1631 [19.4%]) (Figure). (Percentages are calculated with weighted data to reflect the representative proportion in the target US population.)

Compared with individuals who were exclusively heterosexual, those who were mostly heterosexual had higher odds of migraine in an unadjusted model (odds ratio, 1.80 [95% CI, 1.49-2.18]; P < .001) and an adjusted model (adjusted odds ratio, 1.35 [95% CI, 1.10-1.65]; P = .004). Compared with individuals who were exclusively heterosexual, those who were lesbian, gay, or bisexual had higher odds of migraine in an unadjusted model (odds ratio, 1.83 [95% CI, 1.36-2.46]; P < .001) and an adjusted model (adjusted odds ratio, 1.58 [95% CI, 1.17-2.14]; P = .003). Results were similar in sex-stratified models.

Discussion | The results from this study show disparities in migraine among US adults based on sexual orientation. While prior research has shown a high prevalence of migraine as well as other physical health outcomes among adults in sexual minority groups in California, this is the first study (to our knowledge) to reveal these disparities among a nationally representative sample of US adults. Our findings show that adults in sexual minority groups, compared with heterosexual adults, had higher odds of experiencing migraine. Many members of sexual minority groups experience prejudice, stigma, and discrimination termed sexual minority stress, which could trigger or exacerbate migraine. Furthermore, members of sexual minority groups may encounter barriers to health care and experience greater physical and mental health problems, which could contribute to migraine. It is notable that even people identifying as mostly heterosexual had higher odds of migraine compared with those who identified as exclusively heterosexual, in accordance with other physical health disparities noted among nonexclusively heterosexual populations.

Limitations include the use of self-report measures, inability to determine causality because of the cross-sectional design, inability to differentiate sexual identity from behavior, and inadequate power to analyze specific sexual orientations (eg,
lesbian, gay, bisexual), which is an area of future research. Clinicians and researchers should be aware of health disparities in migraine, including sexual orientation, in addition to biological and behavioral risk factors.

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Biotinidase Deficiency as a Mimic of Neuromyelitis Optica Spectrum Disorder in Childhood

Biotinidase deficiency (BD) is a rare, autosomal recessive, metabolic disorder associated with mutations in the BTD gene. Clinical features are heterogeneous, although optic neuropathy and myelitis have been reported in children.1-6 These clinical features can mimic neuromyelitis optica spectrum disorders (NMOSD), which are rare in children. To our knowledge, no prior studies have analyzed shared clinical findings among this patient population. Here, we present what is, to our knowledge, only the second case of BD mimicking NMOSD without elevated lactate, and review prior cases of BD that met Wingerchuk 2015 criteria for NMOSD.

Report of a Case | A 13-year-old healthy girl presented with simultaneous paraparesis and bilateral vision loss. Visual acuity was 20/400 OU, and optic pallor was present bilaterally. Clinical and imaging history are presented in the Table and Figure. For a presumed diagnosis of NMOSD, the patient was treated with intravenous methylprednisolone but worsened with treatment and had immunotherapy ceased.

The patient regained her motor skills over 6 months but had stagnant visual deficits (20/400 OU). Repeated imaging at 1 year showed resolution of signal in the spinal cord and optic nerve atrophy. Serum and cerebrospinal fluid studies remained unremarkable; however, profound biotinidase enzyme activity (BEA) deficiency was identified, as were 3 mutations in the BTD gene (Table). The patient was treated with biotin supplementation (100 mg daily, >1000 × typical multivitamin content) and noted improvement in her visual acuity at 3 months (20/200 OS and 20/100 OD). She continues receiving biotin therapy and has had no further relapses.

Results | Summarized clinical data for children with clinical presentations consistent with NMOSD but found to have BD are presented in the Table. There was no response to immunomodulatory therapy in 3 of 5 cases (60%), and 2 patients had clinical declines associated with treatment. Initial attacks were more likely to demonstrate improvement with immune therapy as opposed to latter relapses. Despite late clinical presentations, all patients had profoundly low BEA (average, 0.16 nmol/min/mL). Genetic mutations of the BTD gene were heterogenous, although 2 patients were noted to have shared mutations (c.1612C>T [p.R538C]). All patients improved with administration of biotin (vision and paresis), and no patient had relapses once beginning supplementation.

Discussion | This case highlights an expanding clinical and genetic spectrum of BD, with increasing overlap of patients with neuroimmunologiclike phenomenon and relapses. Prior reports of isolated optic neuropathy and persons with myelitis with BD exist, although only a minority present with optic neuropathy and myelitis simultaneously.1-6

In this review, several clinical features stand out. First, all patients tested had low BEA, although none had developmental delay or epilepsy, as is reported in profound BD.4 It is unclear why neonatal screening for cases within the United States