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Rethinking Geschwind Syndrome Beyond Temporal Lobe Epilepsy

Burçin ÇOLAK[1], Rıfat Serav İLHAN[1], Berker DUMAN[2,3]

[1]Department of Psychiatry, Faculty of Medicine, Ankara University, Ankara, Turkey
[2]Division of Consultation-Liaison Psychiatry, Department of Psychiatry, Faculty of Medicine, Ankara University, Ankara, Turkey
[3]Neuroscience and Neurotechnology Center of Excellence (NÖROM), Ankara, Turkey

Geschwind Syndrome (GS) is a controversial clinical diagnosis defined as a cluster of inter-ictal behavioral manifestations as hypergraphia, hyperreligiosity, hyposexuality, mental rigidity, verbal and non-verbal viscosity (1). Behavioral manifestations of this syndrome are traditionally thought to be stemmed from temporal lobe epileptic seizures (TLE) via hyper-reactivity in the limbic networks (2). According to N. Geschwind, limbic damage that occurred during seizures cause the syndrome (3). The syndrome also has been known as temporolimbic personality; reflecting behavioral manifestations stemmed from recurrent seizures (4). However, the causality and the association between TLE and GS is still an enthusiastic old debate going on (5). In most cases, the behavioral presentation is interictal without a specific relationship to individual seizures. Besides this, GS-like manifestations also have been reported in other neuropsychiatric conditions (6, 7). For instance, GS has been described in patients with the right temporal variant of frontotemporal lobar degeneration (FTLD), right temporal stroke, right hippocampal atrophy, and various neurodegenerative diseases (8–12). There are also salient overlaps with the phenomenological manifestations of GS and neurodevelopmental disorders such as schizophrenia, schizoaffective disorder, and bipolar disorder without TLE or any neurological disease (13–16).

Electroencephalography (EEG) anomalies with or without any epileptic seizures are also another important aspect of neurodevelopmental disorders. For instance, 60% of patients with autism spectrum disorders (ASD) show abnormal epileptiform activities without any seizures that may contribute to the symptom presentation of ASD (17, 18). EEG and event-related potential (ERP) studies also indicate epileptiform activities without manifest seizures in schizophrenia and bipolar disorders (19). These changes may also be associated with emotional, cognitive, and behavioral aspects of these neuropsychiatric conditions. The rationale for the treatment of these neuropsychiatric conditions with anti-epileptics indicates the importance of subthreshold epileptiform abnormalities in neuropsychiatric conditions. As indicated above, symptoms like hyper-religiosity, hypergraphia, hyposexuality or interpersonal viscosity may indicate shared pathophysiology associated with right temporolimbic structures such as atrophy, sclerosis, or neurodevelopmental deviations in neurosynaptic formations.

Previous research on GS and TLE are still inconclusive probably due to assuming a probable false causality between these two clinical phenomena (20). Perhaps the main problem is in the presentation of the condition. Rather than psychiatric symptoms, mainly the first hospital admission is due to the TLE seizures which attract the clinicians' attention. Hence, behavioral manifestations of GS could easily be misattributed to the TLE. On the other hand, most of the TLE patients are free of these behavioral manifestations which could interfere with previous research findings.

We suggest that GS should be redefined as a neurodevelopmental condition that probably starts in childhood and is associated with temporo-limbic networks with or without any epileptic seizures. Indeed, we hypothesized that although the dysfunctional temporo-limbic networks were the assumed substrate for GS, TLE neither excludes nor supports the condition.

Also, GS may have significant impacts on social groups. Behavioral manifestations such as hypergraphia, hyperreligiosity, hyperviscosity in interpersonal relational patterns may create important and novel mems that motivate the populous in terms of group behavior. Some individuals with GS are also prone to mystic experiences that in turn increases the influence on the group (21). Additionally, GS has been previously associated with various political and ideological charismatic leaders (22, 23). GS could be viewed as a deviation from typical neurodevelopmental pathways with manifest or latent EEG abnormalities to striking neuropsychiatric symptoms such as auditory hallucinations, or charismatic personality characteristics misinterpreted by the groups as a sign of the sacred.

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Correspondence Address: Berker Duman, Division of Consultation-Liaison Psychiatry, Department of Psychiatry, Faculty of Medicine, Ankara University, Ankara, Turkey • E-mail: dumanb@ankara.edu.tr
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To our opinion, GS should be investigated as a unique neurodevelopmental condition independent from TLE with its potential phylogenetic outcomes. We hypothesized that the core feature of GS is its behavioral manifestations and TLE and/or EEG abnormalities should only be included as a specifier. Associations between patients with delusional disorders, paranoid, schizoid, and schizotypal personality disorders, and autism spectrum disorders and GS should also be investigated independently of epileptic seizures (24). This can lead researchers and clinicians to find and apply efficient pharmacological and psychotherapeutic interventions.

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