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Association between personality disorders and migraine. A narrative review

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ABSTRACT

Introduction: Migraine is one of the most prevalent types of headache and is a subject of many clinical trials. There are various risk factors associated with migraine occurrence, from hormonal and genetic to environmental. It is observed that some migraineurs have specific psychological features- sometimes called as migraine personality. This encouraged researchers to evaluate migraine patients in terms of psychiatric co-existing conditions.

Aim of study: The main aim of the study was to examine the relationship between migraine and psychiatric comorbidities, primarily personality disorders.

Materials and methods: This article is based on the literature found in PubMed and Google Scholar Database with the use of keywords such as ”migraine”, “headache factors”, “personality disorder”, “migraine personality”, “migraine education”, “borderline personality disorder”, “anxious personality disorder”, “migraine health”, “depression and migraine”, “medication over-use in migraine”, “migraine comorbidities”, “depression”, “anxiety”.

Results: Investigation of available literature revealed the connection between migraine and personality disorders. Psychiatric comorbidities worsen the treatment prognosis, are a risk factor of medication overuse and chronic headaches.

Conclusion: Psychiatric comorbidities are frequent among migraineurs. Clinical evaluation of these patients should be complex and contain psychological and psychiatric analysis, especially in patients resistant to standard treatment.

Key words: migraine, personality disorder, depression, migraine education, anxiety

Introduction

Headache is one of the most common neurological symptoms reported by patients as almost every person experienced it at least once in a lifetime[1] and the estimated global prevalence of active headache disorder is 52%[2].

There are several types of head pain with migraine being one of them. It is a compound disease characterized by recurrent modern to severe pain attack that lasts 4-72 hours[3] and is associated with nausea, light/sound sensitivity and in some cases- sensory disturbances called aura. Chronic character of the condition and the aggravating symptoms lead to significantly worse quality of life of the people facing migraine episodes[4, 5]. Data shows that the condition is a major cause of disability which is correlated with both personal and socioeconomic burden[5]. Treatment of migraine is based on individual strategy that

integrates proper education of the patient and pharmacological interventions- to relieve the episode and for prophylaxis[6, 7]. Medications that have documented efficacy in alleviating the migraine attack are acetaminophen, nonsteroidal anti-inflammatory drugs, triptans, antiemetics, ergot alkaloids and the decision of which drug is used is based on patients' profile and the severity of the episode[7]. Prophylaxis strategy is mostly based on medications like beta-blockers, antidepressants, calcium-channel blockers and anticonvulsants[8]. Even though, the efficacy of the drugs is improving, there is still a group of patients resistant to pharmacological treatment and in need of high doses of pain killers[9, 10].

A large number of risk factors and comorbidities is associated to migraine[11] including biological, genetic, hormonal components as well as environmental influences. Although in recent years researchers found many connections to this specific type of headache, the conception that migraine should be evaluated in a complex way was presented by Flatau over 100 years ago[12]. In 1948, Wolff et al.[13] suggested that there is a "migraine personality" and there could be a correlation between psychological profile of patients and migraine occurrence. This review aims to present current knowledge of the connection between migraine and personality traits and to investigate the impact of selected personality disorders on migraine treatment.

Methods

We searched online databases, PubMed and Google Scholar, with keywords: "migraine", "headache factors", "personality disorder", "migraine personality", "migraine education", "borderline personality disorder", "anxious personality disorder", "migraine health", "depression and migraine", "medication over-use in migraine", "migraine comorbidities", "depression", "anxiety". Retrospective and observational studies were considered with no restriction on the date of publication, up to December 2023. We excluded publications with no information about personality disorders occurrence in migraine patients' population and the ones irrelevant to the study. There were no restrictions regarding patients' age and gender. The information was selected and presented in Table 1, Table 2 and Table 3.

Results

Table 1. Demographic characteristics of the participants.

Study	Year	No. of patients	Age (years)	Gender (F - M)
Merikangas et al.	1990	457	27-28	232 - 225
Breslau et al.	1993	1007	21-30	621 - 386
Marazziti et al.	1995	73	16-55	52 - 21
Guidetti et al.	1998	100	12-26	60 - 40
Verri et al.	1998	197	19-72	147 - 50
Mitsikostas et al.	1999	620	28-42	394 - 226
Radat et al.	1999	68	46.1 ± 11.5 for cases 42.3 ± 11.5 for controls	60 - 8
Breslau et al.	2000	1284	25-55	1000 - 284
Juang et al.	2000	261	13-81	209 - 52
Lipton et al.	2000	729	16–65	602 - 127
Breslau et al.	2003	1186	25-55	937 - 249
Kececi et al.	2003	947	≥ 18	552 - 395
McWilliams et al.	2004	3032	25-74	1713 - 1319
Lanteri-Minet et al.	2005	10532	18-over 55	5487 - 5045
Jette et al.	2008	36984	15–over 65	20 211 - 16 773
Camarda et al.	2008	1436	≥50	765 - 671
Robbins et al.	2009	1000	20-92	805 - 195
Ratcliffe et al.	2009	4181	18–65	2268 - 1913
Hung et al.	2009	155	N/R	106 - 49
Samaan et al.	2009	2110	19–85	1357 - 753
Muñoz et al.	2015	30	40.7 ± 9.6	26 - 4
Muñoz et al.	2016	164	36.4 ± 12.7	134 - 30
Kayhan et al.	2016	105	35.63 ± 11.61	53 - 52
Yang et al.	2019	61	41.28 ± 12.38	53 - 8

F= female M= Male N/R= not reported

Table 2. Prevalence of personality disorders among the subjects with migraine.

Comorbid disorder	Robbins et al. 2009			Muñoz et al. 2015			Muñoz et al. 2016			Kayhan et al. 2016			Yang et al. 2019		
	Prevalence in migraine population	OR (95 %CI)	P value*	Prevalence in migraine population	OR (95 %CI)	P value*	Prevalence in migraine population	OR (95 %CI)	P value*	Prevalence in migraine population	OR (95% CI)	P value*	Prevalence in migraine population	OR (95 %CI)	P value*
paranoid PD	2%	N/R	N/R	-	-	-	11.6 %	N/R	<0.001	1.9%	-	0.498	9.8%	N/R	N/R
schizoid PD	1%	N/R	N/R	-	-	-	25.6 %	N/R	0.007	0%	-	-	3.3%	N/R	N/R
schizotypal PD	0%	N/R	N/R	-	-	-	5.5%	N/R	0.19	0%	-	-	-	-	-
antisocial PD	3%	N/R	N/R	-	-	-	0%	N/R	0.10	1%	-	1.000	-	-	-
borderline PD	1.2%	N/R	N/R	-	-	-	-	-	-	5.7%	0.16 (0.02–1.41)	0.119	9.8%	N/R	N/R
histrionic PD	5%	N/R	N/R	-	-	-	40.9 %	N/R	0.53	5.7%	0.51 (0.12–2.09)	0.499	1.6%	N/R	N/R
narcissistic PD	4%	N/R	N/R	-	-	-	4.9%	N/R	0.65	6.7%	0.14 (0.01–1.17)	0.066	-	-	-
avoidant PD	1.1%	N/R	N/R	-	-	-	-	-	-	19%	0.27 (0.10–0.70)	0.005	9.8%	N/R	N/R
anancastic PD	-	-	-	93.3 %	N/R	N/R	44.5 %	N/R	0.24	-	-	-	-	-	-
anxious PD	-	-	-	60%	N/R	N/R	53.7 %	N/R	0.36	-	-	-	-	-	-
dependent PD	7%	N/R	N/R	23.3 %	N/R	N/R	32.9 %	N/R	0.39	19%	0.43 (0.01–0.32)	0.000	1.6%	N/R	N/R
OCPD	7%	N/R	N/R	-	-	-	-	-	-	50.5 %	0.08 (0.03–0.19)	0.000	23%	N/R	N/R
passive-aggressive PD	-	-	-	-	-	-	-	-	-	13.3 %	0.20 (0.05–0.72)	0.000	-	-	-
comorbid PD	-	-	-	-	-	-	-	-	-	32.4 %	0.06 (0.01–0.21)	0.000	-	-	-

PD= personality disorder OCPD= obssesive-compulsive personality disorder N/R= not reported OR=odds ratio 95%CI= 95% Confidence Interval *χ^{2} test

Table 3. Prevalence of major depression and generalized anxiety disorder among the subjects with migraine.

Study	Major Depression			Generalized Anxiety Disorder		
	Prevalence in migraine population	OR (95%CI)	P value	Prevalence in migraine population	OR (95%CI)	P value
Merikangas et al. 1990	14.7%	2.2 (1.1-4.8)	<0.05	9.8%	5.3 (1.8-15.8	<0.001
Breslau et al. 1993	34,3%	4.5 (3.0 6.9)*	N/R	10.2%	5.7 (2.7-12.1)*	N/R
Marazziti et al. 1995	6.8%	N/R	N/R	27.1%	N/R	N/R
Guidetti et al. 1998	54.5%	N/R	N/R	81.8%	N/R	N/R
Verri et al. 1998	-	-	-	59.5%	N/R	n.s.
Mitsikostas et al. 1999	3%	7.5	N/R	-	-	-
Radat et al. 1999	5.9%	8.73 (1.78-42.90)	<0.01	23.5%	n.s.	N/R
Breslau et al. 2000	40.7%	3.6 (2.7–4.7) 3.51 (2.64, 4.64)*	N/R	-	-	-
Juang et al. 2000	57%	N/R	N/R	8%	N/R	N/R
Lipton et al. 2000	47%	2.7 (2.1 - 3.5)*	N/R	-	-	-
Breslau et al. 2003	42.1%	3.8 (2.9–5.1)	N/R	-	-	-
Kececi et al. 2003	32.51%	2.80 (1.85, 4.16) 2.8 (1.88, 4.16)*	N/R	-	-	-
McWilliams et al. 2004	28.5%	2.84 (2.19, 3.70)	N/R	9.1%	3.86 (2.48, 6.00)	N/R
Lanteri-Minet et al. 2005	23.2%	1.6 (1.4–1.8)	N/R	-	-	-
Jette et al. 2008	8.6%	1.8 (1.8–1.6)	N/R	-	-	-
Camarda et al. 2008	47.2%	4.7 (3.1–7.0)	<0.0001	-	-	-
Ratcliffe et al. 2009	14.8%	2.13 (1.58–2.86)	<0.0001	3%	2.21 (1.20–4.08)	<0.05
Hung et al. 2009	47.9%	2.9	<0.01	8.2%	1.4	N/R
Samaan et al. 2009	81.5%	3.3 (2.4–4.6)	N/R	-	-	-

N/R= not reported n.s.= non significant OR=odds ratio 95%CI= 95% Confidence Interval *=sex adjusted OR 95%CI P value (χ2 test)

Personality disorders classification

Diagnostic and Statistical Manual of Mental Disorders classifies personality disorders (PD) as maladaptive patterns of behavior, cognition and inner experience, exhibited across many contexts and deviating from those accepted by the individual's culture[14]. According to that publication, personality disorders can be divided into three groups- clusters. Cluster A consists of paranoid, schizoid and schizotypal PD. Cluster B includes antisocial, borderline, histrionic and narcissistic personality disorders. Avoidant, dependent, obsessive-compulsive and non-otherwise specified PD are classified as Cluster C. Personality disorders affect roughly 10 % of the general population[15].

Cluster A and headache

There is limited data focused on investigating correlation between migraine and Cluster A PD. Nevertheless, a few studies report that paranoid and schizoid personality disorders are observed in patients experiencing a rare condition called cluster headaches(CH)[16-18]. Cluster headache is a very painful type of headache occurring in periods called clusters.

The intense pain is located in or around eye or inside the head, strictly one-sided. The attack appears usually at the same time of the day and night for several weeks but the length of the cluster can vary[19]. Muñoz et al.[16] compared migraine patients with cluster headache patients. The results showed that compared to migraineurs, paranoid ($p < 0.001$; $\chi 2$ test), and schizoid traits ($p = 0.007$; $\chi 2$ test) were significantly more prevalent in CH patients. Other work focusing on investigating PD in migraine patients reported no patients experiencing both migraine and Cluster A traits[17]. The role of these psychopathological aspects in CH is not clarified and needs to be investigated more in the future.

Cluster B and migraine

Data gathered in Table 2 prove the frequent occurrence of Cluster B PD in migraine population[17, 20, 21]. Although all personality disorders from that group are likely to impact migraine, the majority of headache literature is focused on borderline personality disorder(BPD). BPD is a mental illness characterized by difficulty in controlling emotions, leading to increased impulsivity, intense fear of abandonment, oscillation between idealizing

and devaluing others and attempts of self-harm[14]. A sample of 61 patients with migraine included 6 patients with BPD diagnosis[20]. Compared to migraine patients without personality disorders, comorbidity with any personality disorders was associated with an increased frequency of chronic migraine ($p < 0.001$) and more severe headache. Rothrock et al.[22] evaluated 50 consecutive patients with migraine and previously documented BPD, 50 consecutive patients with migraine of all types and no history of BPD, and 50 patients with migraine and no history of BPD matched to the first group for age, gender, and headache frequency. The investigation indicated that patients with coexisting BPD were clinically distinct from the migraine patient population as a whole. This group presented more pervasive headache, lower likelihood of responding to pharmacological treatment resulting in higher prevalence of medication overuse headache(MOH) and more unscheduled visits for acute migraine treatment. Moreover, simple screening instruments used to detect BPD appeared to be ineffective. Existence of MOH in personality disorders patients is a known fact[23, 24] and is considered a risk factor of developing a chronic migraine[25]. Struggle with relieving pain can result in overuse of opioids as stronger analgesics[26]. Not only it should be taken into consideration because of potential development of opioid addiction and presence of life-threatening adverse events of that group of medication[27] but also because of the fact that opioid consumption can lead to deterioration of severe borderline behavior and dissociative symptoms in BPD patients[28]. It was stated that some patients show at least short-term improvement in dissociative behavior when given opioid antagonists. Optimal treatment of coexisting migraine and borderline personality disorder should be a combination on both pharmacotherapy and ongoing psychotherapy. A promising solution for the severe cases could be a comprehensive inpatient treatment including intravenous and oral medication protocols, drug withdrawal when indicated, cognitive-behavior therapy, and other services when needed, including anesthesiological intervention as it was reported to have 78% efficacy[26]. However, this remains a very strict program which relies on individual's continuity of care, compliance and home or work environment.

Cluster C and migraine

Studies presented in Table 2 also reveal that personality disorders categorized in the Cluster C are observed in migraine subjects. Anxious, avoidant, dependent PD are strongly correlated with depression and generalized anxiety disorder(GAD)[24, 29, 30] which explains that current literature focuses primarily on these psychiatric diseases and its impact on migraine

instead of the Cluster C PD alone. Information about studies addressing this topic is gathered in Table 3. Various research groups observed correlation between both depression and anxiety in migraine population[31-34]. Samaan et al.[35] observed that recurrent headache is specifically associated with depression and migraine with aura. The pathophysiology of that connection remains unclear but some studies support serotoninergic involvement as an explanation to coexistence of depression, anxiety and migraine in significant group of headache patients[36]. Gender is supposed to be considered as a risk factor of depression and anxiety-complicated migraine as women suffer from it more often[37]. Moreover, a study by Guidetti et al.[38] revealed that worse prognosis of the migraine treatment complicated by depression is significantly more observed in female group. Nonetheless, prevalence of depression in general is higher among females[39] so it can explain observed correlations. Some researchers aimed to investigate what is the order of the illnesses' appearance. In one study[40], anxiety was shown to precede migraine in most patients, which in turn preceded depression. Other authors presented similar results[41, 42], indicating that the onset of anxiety preceded that of migraine, which in turn preceded that of depression in most patients, and that the ages of onset of each disorder were significantly correlated. Another interesting finding addressing migraine and its link to depression and anxiety is that even among pediatric population, headache is more frequently observed in children facing depressive episodes and anxiety[43]. Galli et al.[44] evaluated 200 children experiencing headache and their parents. 94 mothers (47%) and 51 fathers (25.5%) had at least one psychiatric disorder, mainly mood and anxiety disorders. A significant interaction has been found ($P < 0.05$) showing that migraineurs with high familial recurrence of headache had a higher percentage (74.65%) of psychiatric disorders than no-migraineurs (52.17%). Another aspect of migraine that should be taken into consideration in clinical practice is the problem of medication overuse. A few studies reported that depression and anxiety are linked to MOH[45, 46]. Migraine patients with psychiatric disorders tend to be less skilled in coping with pain[47]. Mose et al.[48] observed that MOH affects women more frequently. Females experiencing this type of headache were also more introvert and less socially oriented. Migraine subjects are also rated as less calm, less capable of relaxing and more irritable, with tendency to responding with tension[49]. These findings are not only a problem for the individuals suffering from mental and somatic difficulties but also for the general public as social and economic effects of depression and mood disorders include functional impairment, disability or less work productivity and increased use of health services[50].

Conclusions

This review indicated the presence of psychiatric comorbidities among migraine patients. Personality disorders, depression and anxiety worsen the prognosis of migraine treatment and are a risk factors of medication overuse, especially in female group. Investigation of psychiatric illnesses should be more present in clinical practice with migraine patients, especially the ones resistant to standard therapies. Optimal migraine pharmacotherapy and psychiatric treatment could improve this subjects' outcomes. Unfortunately, there is no entirely effective test detecting psychiatric comorbidities among migraineurs. Further research is necessary to improve detection and treatment of migraine patients with mental disorders.

Author's contribution:

Conceptualization: EO and OS; methodology: OS; software: AK; check KC, KB; formal analysis EW, JJ; investigation EO, OS; resources OŁ, AMK, EO; data curation KB, KC, EW, EO, OS, JJ, OŁ, KS, AMK, AK; writing - rough preparation EO, OS, KS, AK; writing - review and editing KB, KC, EW, EO, OS, JJ, OŁ, KS, AMK, AK; visualization KS, KB, KC; supervision EO, OS; project administration AK, KC, EO;

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