

Headache Disability, Suicidality and Pain Catastrophization - Are They Related

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ABSTRACT

Introduction: Studies have found that headache is associated with suicidality. Some demographic and clinical features have been reported to be associated with suicidality. Pain catastrophizing and disability may also have bearing on suicidality in patients with headache.

Aim: To evaluate the relationship between pain disability and catastrophizing in headache and suicidal behaviour.

Materials and Methods: Patients diagnosed with headache were recruited from neurology Out-Patient Department (OPD). With ethical approval and informed consent, patients were subjected to a structured interview. Headache disability and pain catastrophizing was assessed with the Henry Ford Hospital Headache Disability Inventory (HDI) and Pain Catastrophy Scale (PCS) respectively. For evaluation of suicidal ideation and behaviour, MINI International Neuropsychiatric Interview (MINI Plus) scale and The Columbia-Suicide Severity Rating Scale (C-SSRS) were applied. Data was analysed with Mann-Whitney U test and Kruskal-Wallis test using appropriate statistical programs.

Results: In 200 patients of headache, male: female ratio was 0.48: 1. Headache disability was significantly higher in females ($p=0.060$) and unemployed ($p=0.019$) patients whereas, pain catastrophizing was significant in patients belonging to low socioeconomic class ($p=0.045$). Headache disability and pain catastrophizing had significant association with suicidal ideation. Disability score was significantly associated with the score of deterrents ($p=0.067$) and controllability ($p=0.039$) subscale of intensity of suicidal ideation. There were four patients who actually attempted suicide. Pain catastrophizing was significantly associated with non-suicidal self injurious behaviour ($p=0.041$).

Conclusion: Disability due to headache and pain catastrophizing is associated with increased suicidal tendencies, behaviour and suicidal attempts. Headache in females and patients in rural habitat, unemployed individuals belonging to low socioeconomic class need special attention to reduce high risk suicidal behaviour.

Keywords: Functional impairment, Pain sensitivity, Suicidal behaviour

INTRODUCTION

Headache is the commonest neurological disorder with life-time prevalence of 78% [1]. Tension-type is the commonest headache followed by migraine headaches [1]. Recurrent headaches impair the Quality of Life (QoL) of an individual [2]. Migraine is the sixth highest cause of disability worldwide [2]. Medication-Overuse Headache (MOH) that often accompany with migraine or tension headache also leads to disability in large number of patients [2]. Combined together, headache disorders rank as third among the worldwide causes of disability, as measured in Years of Life Lost to Disability (YLDs) [3].

A total of 68-94% of patients may experience moderate to severe disability on the functioning of activities of daily living [4,5]. These estimates has implications in Indian context because over 16% of the world's population lives in India [6]. In India prevalence of headache is more than the average report from other countries [7]. Rao et al., observed a prevalence of headache disorders to be 23% in general population, a significant disease burden in Indian population [8]. Bera et al., reported that in north India subjects with migraine, 5% had suicidality and 60% had very severe to substantial impact on functioning. Similarly, in subject with tension headache suicidality increased to 7.5% and 47.7% had very severe to substantial impact on functioning [9]. Efforts to reduce the burden, to minimize the disability and to improve the QoL with headaches lead to the initiation of a global campaign against headache in 2003 [10].

Catastrophizing is a tendency to magnify or exaggerate the threat value or seriousness of pain sensations [11]. Pain catastrophizing

is identified as an independent risk factor for predicting chronicity of pain and is associated with poor prognosis and disability in recurrent pain disorder [12]. Increased intensity of pain and disability associated with headaches increases the risk of suicidal tendencies [1]. Further; presence of psychiatric co-morbidity may increase the risk of suicide in such individuals [13].

As mentioned earlier headache prevalence from India is 63% of which 22% being severe headache [14]. Figures on suicide rate in India suggest that about 11 per million populations have suicidal tendencies and this rate is increasing over-time [15].

Thus, suicidality can have a positive correlation to pain catastrophizing and disability in patients with headaches. Given the lack of literature evidence from India related to this subject, we aimed to examine the relationship of suicidality with pain catastrophizing and disability in patient with headache.

MATERIALS AND METHODS

We conducted a single centre, cross-sectional study at JSS Hospital, Mysuru. For this study, a sample size of 200 was recommended by institutional reviewers, which was based on number of patients reporting with complaint of headache in neurology out patient Department every day and patient selection criteria. The study was carried out over a period of 6 month (May-October, 2015) after approval from the institutional ethics committee. A total 200 consecutive patients were recruited for this study. Adults aged 18 to 65 years of either gender who were diagnosed with primary headache of minimum 3 months duration were included [16]. Any individual with psychiatric disorder (as identified by ICD 10 diagnosis criteria), diabetes mellitus, hypertension, pregnancy, drug abuse and known cancer were excluded.

After obtaining an informed consent, clinical and neuropsychiatric assessment was done in recruited patients. Sociodemographic and baseline clinical parameters were recorded. Patients were subjected to structured interviews and were further evaluated with assessment tools. The M.I.N.I. Plus (MINI International Neuropsychiatric Interview) English Version 5.0.0 was applied to the patients [17]. The M.I.N.I. Plus is a brief structured tool to diagnose axis in psychiatric disorders and symptoms accounted for by an organic cause or by the use of alcohol or drugs in DSM-IV and ICD-10.

The Columbia-Suicide Severity Rating Scale (C-SSRS) was introduced for identifying suicidal ideation [18]. It has been reported to have high sensitivity and specificity for suicidal behaviour classifications. The domains of suicidal ideation and suicidal behaviour which were assessed by C-SSRS are: I) Severity of ideation; II) Intensity of ideation; III) Behaviour; and IV) Lethality.

The Henry Ford Hospital Headache Disability Inventory (HDI) was introduced for assessing disability caused by headache. It consists of 25 items, and each items has an option to respond yes (score= 4), sometime (score=2), and no (score =0). It can be grouped in two subscales; emotional and functional. It has scores of minimum of 0 and maximum of 100. Emotional subscale score ranges from 0 to 52 while functional subscale score ranges from 0 to 48. The higher the score the greater the disability caused by the headache [19].

Next, we assessed patients with Pain Catastrophy Scale (PCS) [20]. The PCS provides reflection on past painful experiences and it indicates the degree to which they experienced each of 13 thoughts or feelings when experiencing pain on a 5-point scale from 0 (not at all) to 4 (all the time). The PCS total score is computed by summing responses to all 13 items. PCS total scores range from 0 to 52. The PCS subscale includes rumination and magnification. Coefficient alpha for the total PCS is 0.87 [20].

STATISTICAL ANALYSIS

Data analysis was done with SPSS version 16. Demographic and clinical characteristics were expressed with descriptive statistics. Kruskal-Wallis H test was used to describe the group difference between three or more variables, while Mann-Whitney Test was used for comparison between two groups. The level of statistical significance was kept at $p < 0.05$ for all tests.

RESULTS

Among 200 participants, most of them were females ($n=135, 67.5\%$), Hindu by religion ($n=177, 88.5\%$) married ($n=153, 76.5\%$), and were educated ($n=173, 86.5\%$). Majority of them belonged to rural background ($n=120, 60\%$) and were from middle socioeconomic class ($n=123, 61.5\%$), and had nuclear families ($n=175, 87.5\%$). Participants belonging to lower socioeconomic status class had significantly ($p=0.045$) higher pain catastrophizing than other socioeconomic class population. No significant differences were observed for any other demographic parameters for pain catastrophizing; though it was higher in females, rural population, Muslim and other religion, nuclear family, married individuals who were uneducated and were employed. More disability (but statistically not significant) was associated with female gender ($p=0.060$) than males, and unemployed status ($p=0.019$) of the participants [Table/Fig-1].

Significant pain catastrophizing was associated with presence of almost every category of active suicidal ideation including wish to be dead except for active suicidal ideation with some intent to act without specific plan [Table/Fig-2]. Similarly, disability had significant association with presence of active suicidal ideation with some intent to act, without specific plan ($p=0.035$), active suicidal ideation with any methods (not plan) without intent to act ($p=0.008$), non-specific active suicidal thoughts ($p=0.005$)

Variables		N	HDI Score		PCI Score	
			Mean Rank	p-value	Mean Rank	p-value
Gender	Male	65	89.40	0.060	98.74	0.765
	Female	135	105.84		101.35	
Domicile	Rural	120	105.63	0.125	102.42	0.566
	Urban	80	92.81		97.62	
Religion	Hindu	177	101.62	0.447	99.75	0.613
	Muslim & other	23	91.87		106.24	
Socio-economic Status	Lower	77	107.76	0.160	110.86	0.045*
	Middle	123	95.96		94.01	
Family Type	Nuclear	175	100.61	0.941	102.99	0.108
	Joint	25	99.70		83.10	
Marital Status	Single	47	98.46	0.782	91.12	0.204
	Married	153	101.13		103.38	
Education	Uneducated	27	111.39	0.293	110.81	0.319
	Educated	173	98.80		98.89	
Employment	Unemployed	85	111.66	0.019*	96.01	0.345
	Employed	115	92.25		103.82	

[Table/Fig-1]: Demographic characteristics and its relationship with pain catastrophizing and disability. Mann-Whitney U test, * $p < 0.05$ significant

Variables		N	HDI Score		PCI Score	
			Mean Rank	p-value	Mean Rank	p-value
Active suicidal ideation with specific plan and intent	Yes	2	165.00	0.113	187.50	0.033*
	No	198	99.85		99.62	
Active suicidal ideation with some intent to act without specific plan	Yes	3	170.50	0.035*	162.33	0.062
	No	197	99.43		99.56	
Active Suicidal Ideation with Any Methods (Not Plan) without Intent to Act	Yes	4	176.62	0.008*	169.75	0.016*
	No	196	98.95		99.09	
Non-specific active suicidal thoughts	Yes	7	161.36	0.005*	158.29	0.007*
	No	193	98.29		98.40	
Wish to be dead	Yes	22	108.11	0.513	126.48	0.026*
	No	178	99.56		97.29	

[Table/Fig-2]: Suicidal ideation and its association with pain catastrophizing and disability. Mann-Whitney U test, * $p < 0.05$ significant

[Table/Fig-2]. Disability score had significant group difference on deterrents and controllability subscale on the score of intensity of suicidal ideation [Table/Fig-3]. Fewer number of patients had suicidal behavioural tendencies. Pain catastrophization also had significant association with presence of Non-Suicidal Self-Injurious Behaviour [Table/Fig-4].

Variables	N=200	HDI Score		PCI Score	
		Mean Square	p-value	Mean Square	p-value
Reasons for Ideation		408.240	0.458	329.315	0.089
Deterrents		753.446	0.383	269.470	0.067
Controllability		455.598	0.433	481.941	0.039*
Duration		1060.530	0.238	252.073	0.109
Frequency		1060.530	0.238	252.073	0.109
Most Severe Ideation		901.985	0.295	251.051	0.110

[Table/Fig-3]: Association of intensity of suicidal ideation with pain catastrophizing and disability. ANOVA using Kruskal-Wallis, * $p < 0.05$

Variables		N	HDI Score		PCI Score	
			Mean Rank	p-value	Mean Rank	p-value
Suicidal Behaviour	Yes	1	148.50	0.406	175.50	0.194
	No	199	100.26		100.12	
Aborted Attempt	Yes	1	148.50	0.406	175.50	0.194
	No	199	100.26		100.12	
Interrupted Attempt	Yes	2	103.00	0.951	103.00	0.951
	No	198	100.47		100.47	
Non-Suicidal Self-Injurious Behaviour	Yes	2	171.75	0.080	183.75	0.041*
	No	198	99.78		99.66	
Actual Attempt	Yes	4	145.62	0.115	149.38	0.088
	No	196	99.58		99.50	

[Table/Fig-4]: Association of suicidal behaviour with pain catastrophizing and disability.
Mann-Whitney U test, *p<0.05 significant

DISCUSSION

Our study suggests the possible association between pain catastrophizing and disability due to headache with increased suicidal behaviour. This highlights the importance of assessing pain catastrophizing behaviours and disability due to headache, which being very common illness with prevalence as high as 35% [8]. Female gender, rural population, Hindu religion, nuclear family, being married, uneducated and unemployed are likely to have more severe headache disability and pain catastrophizing as identified in our study. Severe headache is usually disabling to the individuals, resulting in interference in day-to-day activities. Such substantial impairments in both physical and psychological functions can seriously impact academic, occupational, social and family lives. Also, female headache sufferers usually tend to outnumber with a ratio of nearly 3 to 1 as compared to males [7]. This was evident in our study as significant number of females had association with disability due to headache. Unemployment was observed to be associated with headache disability. This probably is not surprising since disability due to headache may lead to work absenteeism resulting in higher chances of unemployment [21]. Pain catastrophizing had also been reported to be associated with employment difficulty [22]. Though non-significant, patient who were unemployed had higher association with pain catastrophizing in our study. However, catastrophizing of pain is significantly experienced by those participants who belonged to lower socio-economic status. Higher socioeconomic status is believed to have greater access to discretionary procedures and thus show healthier behaviours and better mental health [23]. Thus such individuals usually have lower pain catastrophizing than low socioeconomic status.

Severity of pain caused by headache might have influence on risk of suicide attempt associated with migraine. Increased pain severity is found to increase the risk of such suicidal attempts [1]. Notably; pain catastrophizing is linked to exaggerated negative mood and depression. This critical observation purports association of chronic pain with increased tendencies of suicidal ideation and high rates of suicide. We observed that higher pain catastrophizing was associated with presence of active suicidal thought, suicidal ideation and intention with or without any specific plan. Besides pain catastrophizing, common psychological factors identified are helplessness and hopelessness about pain, the desire for escape from pain, problem-solving deficits, magnitude of depressive symptoms, the degree of pain-related catastrophizing and maladaptive cognitive/emotional pain-coping strategies [24,25].

Disability increases twice the likelihood of suicidal thoughts, suicidal ideation and its intensity; particularly in those who experience higher levels of social stress and emotional reliance and lower levels of social support, mastery, and self-esteem [26]. We also

observed that higher disability was associated with presence of active suicidal thoughts or ideation with intent and with or without specific plan. Studies reported that endorsing a preference for death over disability was associated with wanting to die because of pain, recent suicidal ideation and having a suicide plan, among other suicide variables [27]. Similarly, pain catastrophizing was significantly associated with such suicidal ideations in our study. Also, disability score was significantly associated with the score of deterrents and controllability subscale of intensity of suicidal ideation. Disability is a risk factor for suicidal ideation for several reasons. First, physical disability represents a source of chronic stress that involves lasting difficulties in managing every-day instrumental and social activities [28]. Secondly, recent research has documented strong relationships between disability and emotional distress, social inadequacy and alienation [29,30]. To the extent that the person with disability view themselves as a constant burden to others, especially close kin, they may see suicide as a solution to this perceived problem [31].

We observed a significant association between pain catastrophizing and Non-Suicidal Self-Injurious Behaviour (NSSI). Headache induces distress and intense negative emotion, which may lead to experiential avoidance (to avoid or escape from unwanted internal experiences) that may initiate and maintain NSSI behaviour [32,33]. NSSI allows individuals to express, alleviate, or control intense emotional experiences [34,35]. Other research also indicates that: (a) acute negative affect precedes self-injury; (b) decreased negative affect and relief are present after self-injury; (c) self-injury is most often performed with intent to alleviate negative affect; and (d) negative affect and arousal are reduced by the performance of self-injury proxies in laboratory settings [36]. Research also indicates that self-injury serves as anti-dissociation, interpersonal-influence, sensation-seeking, communal coping and interpersonal boundaries functions [36]. Some theorists have argued that early experience of trauma damages certain neuroanatomical pathways in the brain related to the release of endorphins, which are implicated in the regulation of emotional states. In individuals whose neural pathways are affected in this way, it is suggested that deliberate self-harm may offer a means of releasing endorphins. Others have noted changes in the brain systems utilizing the neurotransmitter serotonin in both suicide and deliberate self-harm.

LIMITATION

In this study the number of subjects with NSSI were few, hence the implication of this finding is limited.

CONCLUSION

Our study provides insights into the common problem of headache, where disabling headache and pain catastrophizing may be associated with increased suicidal ideation and suicidal behaviour. Recurrent intense headache with pain catastrophizing may lead to intuitive suicidal thoughts that may result in suicidal behaviours and non-suicidal self injurious behaviour. Headaches in female gender, unemployment and low socioeconomic status; all of these factors cautions for association with pain disability and catastrophizing in order to reduce suicidal ideation and behaviour. This finding is supported by WHO recommendation; that Health-care services need to incorporate suicide prevention as a core component. Since, there is a high prevalence of headache in the general population, there is a strong need to look into these issues. However, the finding of this study is applicable to subject availing service from a tertiary care centre, and further study in general population is needed with bigger sample size.

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