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Idiopathic Intracranial Hypertension Is Associated with Depression Regardless of Weight: A Controlled Study

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Abstract

Research Background: Idiopathic intracranial hypertension (IIH) is a common disease among obese women during their childbearing years, and it could be associated with depression. It is unclear whether obesity contributes also to depression among these patients. **Research Objective:** To evaluate patients with IIH for the existence of depression using the Hamilton Depression Rating Scale (HAM-D) questionnaire score, compared to age- and BMI-matched healthy control group. **Methods:** Controlled IIH patients were prospectively recruited from the neuro-ophthalmology clinic at Tzafon Medical Center, Poria. Following consent, patients were interviewed and answered the HAM-D questionnaire. A healthy age- and body mass index (BMI)-matched participants from the same population (control group), were also recruited and interviewed by the same investigator answering the same questionnaire. Demographics and BMI were documented in both groups. HAM-D score of >10 is significantly associated with depression. **Results:** Thirty-two and 28 from the patients and control group, respectively, had completed the study. Mean age was 28.6 ± 7.51 and 32.467 ± 8.22 years of both patient and control groups, respectively (P = 0.07). Mean BMI was 32.8 ± 6.87 and 32.1 ± 3.78 respectively (P = 0.621). The IIH group's mean HAM-D scores was 11.62 ± 8.2 as compared to 3.179 ± 2.407 in the control group (P = 0.000). The most significant differences included the questionnaire items of insomnia initial, work and activities, somatic general and somatic symptoms general. **Conclusion:** IIH patients had significantly higher HAM-D scores compared to the control group. This score seems to be irrelevant to the weight of the patient. Psychological

support in addition to the conventional treatment of IIH, is needed to improve the quality of life of these patients.

Keywords

Idiopathic Intracranial Hypertension, Depression, Obesity, BMI, HAM-D Questionnaire

1. Introduction

Idiopathic intracranial hypertension (IIH), known also as pseudotumor cerebri, is quite a not rare disease [1]. It affects mainly young obese women during their childbearing years [2]. Its incidence in this group is estimated to be 20 per 100,000 per year [3]. It is characterized mainly by headache, visual loss and pulsatile tinnitus [4]. This entity could be associated with severe disability, and its negative impact on the quality of life of these patients could be tremendous, including depression [5].

Few studies only were performed addressing the issue of depression in IIH [5] [6]. In one study, depression among IIH patients was attributed partially to obesity. In another study, IIH was associated with depression more than in the general population, but comparable to women with migraine.

On the other hand, some studies also showed a causative correlation between obesity and depression [7] [8]. This causative correlation between obesity and depression was attributed to low levels of glutamine among obese patients. So, it is not clear whether weight by itself has a significant role in the development of depression among these patients.

HAM-D is a reliable questionnaire that is widely used in clinical trials to assess patients who might have a depressive disorder [9]. It is a reliable and reproducible questionnaire.

In this study, we prospectively evaluated patients with IIH and an age- and weight-matched group from the same population, for the existence of depression, using the HAM-D questionnaire.

2. Materials and Methods

Non-selected controlled IIH patients who came to follow-up examination were sequentially prospectively recruited from the neuro-ophthalmology clinic at Tzafon Medical Center, Poria. Following consent, patients were frontally interviewed by the same investigator and completed the HAM-D questionnaire with them.

As mentioned earlier, HAM-D is a reliable questionnaire that has been widely used in clinical trials for many years to assess patients who might have a depressive disorder [9] (**Appendix**). It covers items such as mood, feelings of guilt and suicide, insight, anxiety, agitation, insomnia, work activities, somatic symptoms, genital symptoms, hypochondriasis, weight and others. The score range from zero up to

four in some items and from 0 to 2 in others. It is reliable and reproducible with a consistency rate of 0.8, and inter-examiner reliability of 0.8 - 0.98. The test-pre-test reliability and validity are 0.65 and 0.91 compared to severity of depressive borderline criteria. In this questionnaire, scores between 0 - 9 rules out depression, 10 - 13 represent mild depression, 14 - 17 represent moderate depression, Scores > 17 indicates severe depression, and 23 or more represent a very severe depression.

Inclusion criteria included diagnosis of IIH according to modified Dandie's Criteria, women only, age between 18 and 48 years, follow-up duration of at least 6 months at our neuro-ophthalmology clinic, patients with improved symptoms and signs under treatment. Exclusion criteria included failure of medical treatment in terms of improvement of papilledema and headaches frequency, and patients with a known diagnosis of psychiatric disorder including depression.

An age and weight-matched group from the same population (each patient was asked to bring with him a friend with about the same weight and age, but not a relative) was asked to participate as control group, and interviewed the same way as the patient's group, after consent. This way of control group recruitment is in order to minimize biases related to social background among the patients' and control groups, which could have impact on tendency towards depression. Both groups were interviewed by the same investigator (LN) who was blinded to the existence of IIH among the participants.

For statistical analysis, Chi-square test was used between the categorical parameters of the demographics, and unpaired t-test was used to compare between the scores of each item of the questionnaire, of both patients and controls.

This study was approved by the local ethics committee of the Tzafon Medical Center.

The approval # was 0092-19-POR, and the study was conducted and performed according to the Declaration of Helsinki.

3. Results

Table 1 summarizes the demographics of the patients. No significant difference was observed between the different parameters of both groups. Most of the participants of both groups (patients and control) were young (28.6 years vs 32.47, respectively) and obese (BMI of 32.8 vs 32.1 respectively).

Table 1. Demographic of both patients' and control groups.

Parameter	Result		P value
	Patients	Control	
-Age	28.6 ± 7.51, 18 - 45	32.47 ± 8.22, 18 - 48	0.07
-Single: Married	10:22	12:16	0.369
-Academic education	17:15	16:12	0.443
-Employed	22:10	19:9	0.942
-BMI	32.8 ± 6.87, 19.3 - 43	32.1 ± 3.78, 28.4 - 42.5	0.621

Table 2. Questionnaire result among patients, and control groups.

Parameter	Result Patient group	Result Control group	P value
-Depressed mood	1.41 ± 1.10, 0 - 4	0.571 ± 0.991, 0 - 4	0.003
-Feelings of guilt	0.594 ± 0.875, 0 - 3	0.107 ± 0.315, 0 - 1	0.005
-Suicide	0.344 ± 0.902, 0 - 4	0.036 ± 0.189, 0 - 1	0.082
-Insomnia-initial	1 ± 0.842, 0 - 2	0.071 ± 0.262, 0 - 1	0.000
-Insomnia-delayed	0.656 ± 0.787, 0 - 2	0.357 ± 0.559, 0 - 2	0.092
-Insomnia-middle	0.5 ± 0.622, 0 - 2	0.179 ± 0.476, 0 - 2	0.028
-Work and activities	0.937 ± 1.162, 0 - 3	0.036 ± 0.189, 0 - 1	0.000
-Retardation	0.406 ± 0.712, 0 - 3	0.071 ± 0.262, 0 - 1	0.018
-Agitation	0.719 ± 0.813, 0 - 2	0.429 ± 0.573, 0 - 2	0.113
-Anxiety-psychic	1 ± 0.916, 0 - 2	0.607 ± 0.629, 0 - 2	0.055
-Anxiety-somatic	0.906 ± 1.088, 0 - 3	0.179 ± 0.476, 0 - 2	0.001
-Somatic symptoms*	0.656 ± 0.787, 0 - 2	0.036 ± 0.189, 0 - 1	0.000
-Somatic symptoms general	0.844 ± 0.847, 0 - 2	0.036 ± 0.189, 0 - 1	0.000
-Genital symptoms	0.344 ± 0.543, 0 - 1	0.000 ± 0.000, 0 - 0	0.001
-Hypochondriasis	0.469 ± 0.803, 0 - 2	0.464 ± 0.744, 0 - 2	0.002
-Weight loss	0.480 ± 0.308, 0 - 1	0.000 ± 0.000, 0 - 0	0.001
-Insight	0.531 ± 0.507, 0 - 1	0.000 ± 0.000, 0 - 0	0.001
Total score	11.62	3.179	0.000

*Somatic symptoms-Gastrointestinal.

Table 2 summarizes the scores of the different items of the questionnaire results. There was a significant difference between the patients and control group in nearly all the parameters with a mean score of 11.62 (indicative of depression) vs 3.179 (normal) (P = 0.000), indicating mild depression among the patients' group.

The most significant differences between the patients, and control groups included items of insomnia initial, work and activities and somatic symptoms. Three items only had no significant difference, though were on the edge of significance, and included suicide, insomnia delayed and psychic anxiety.

4. Discussion

The most important finding in our study is that IIH is strongly associated with depression, though mild, and that this correlation is irrelevant to the BMI of the patients. The significance of findings was observed in nearly all the items of the questionnaire with huge gap between the mean score among the patients' group (11.62) compared to the control group (3.179, P = 0.000). The control group of obese persons had no indication of depression.

These results should encourage the neuro-ophthalmologist to refer patients diagnosed with IIH for the evaluation of depression. Generally, there is no known

contraindication of anti-depressants with the treatment of IIH.

The items of the questionnaire with the most significant scores were insomnia-initial, work + activities and somatic symptoms. Quality of sleep is an important factor for quality of life [10]. Insomnia by itself is significantly associated with depression [11]. Unemployment is also known as a strong risk factor for the development of depression [12]. It is also known that there is a strong correlation between inactivity and depression, and that small doses of physical activity can lower risks of depression [13]. Somatic symptoms are known predictors for the identification of subthreshold depression up to major depressive disorders in primary care settings [14].

It is interesting to note that among three items of the questionnaire; suicide, insomnia-delayed and anxiety, the scores were on the edge of significance, while there was no difference with the item of agitation. So, it seems with existing various symptoms of depression of the questionnaire among our patients, the risk of suicide in some way is diminished, reducing the fear in some way of this dreadful complication.

Agitation by itself, could also be observed in different situations, other than depression [15]. There are no studies also showing a protective effect of obesity against agitation.

The mechanism of depression in IIH is most probably related mainly to the disability of these patients from the symptoms of IIH, mainly headache, visual loss, pulsatile tinnitus and maybe due to other factors.

Several studies had shown that headache is a risk factor for the development of depression [16] [17]. These studies included patients with headaches due to different reasons, such as migraine. There are no studies in the literature about the association between visual loss and/or tinnitus with depression. Studies evaluating the correlation between visual loss or pulsatile tinnitus with depression are needed.

It must be remembered that our study included only patients with controlled IIH patients. Patients without treatment or with recent diagnosis, most probably would have higher scores of the questionnaire.

The question remains if other mechanisms play a role in the development of depression, or depression itself is a risk factor for the development of IIH. All of our patients reported that the changes in mood they experience, started following headache (data not shown). We also are not aware of studies linking acetazolamide treatment of IIH, with depression. We did not find studies in the literature comparing the scores of HAM-D questionnaire at presentation or early stages of the disease compared to the period under control.

The drawbacks of our study is the small number of our patients. However, the scores of our study were relatively consistent. Future prospective studies with larger number of patients are needed. Sometimes, interviewer-assisted questionnaires could be associated with some biases [18]. In our study, the interviewer tried as much as he could to give the same information and assistance, equally between the different patients, in addition to being blinded to the existence of IIH among

the participants.

In summary, our results added new information about the association between IIH, obesity and depression, and more studies with large number of patients are needed in the future.

5. Conclusion

IIH patients had significantly higher HAM-D scores irrelevant to the weight of the patient. Psychological support in addition to the conventional treatment of IIH, is needed to improve the quality of life of these patients.

Data Availability

Data is available upon request.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

[1] Raoof, N., Sharrack, B., Pepper, I.M. and Hickman, S.J. (2011) The Incidence and Prevalence of Idiopathic Intracranial Hypertension in Sheffield, UK. *European Journal of Neurology*, **18**, 1266-1268. https://doi.org/10.1111/j.1468-1331.2011.03372.x

[2] Boyter, E. (2019) Idiopathic Intracranial Hypertension. *Journal of the American Academy of Physician Associates*, **32**, 30-35. https://doi.org/10.1097/01.jaa.0000554732.85914.91

[3] Kilgore, K.P., Lee, M.S., Leavitt, J.A., Mokri, B., Hodge, D.O., Frank, R.D., *et al.* (2017) Re-Evaluating the Incidence of Idiopathic Intracranial Hypertension in an Era of Increasing Obesity. *Ophthalmology*, **124**, 697-700. https://doi.org/10.1016/j.ophtha.2017.01.006

[4] Durcan, F.J., Corbett, J.J. and Wall, M. (1988) The Incidence of Pseudotumor Cerebri. *Archives of Neurology*, **45**, 875-877. https://doi.org/10.1001/archneur.1988.00520320065016

[5] Kleinschmidt, J.J., Digre, K.B. and Hanover, R. (2000) Idiopathic Intracranial Hypertension. *Neurology*, **54**, 319-319. https://doi.org/10.1212/wnl.54.2.319

[6] Mollan, S.P., Subramanian, A., Perrins, M., Nirantharakumar, K., Adderley, N.J. and Sinclair, A.J. (2023) Depression and Anxiety in Women with Idiopathic Intracranial Hypertension Compared to Migraine: A Matched Controlled Cohort Study. *Headache: The Journal of Head and Face Pain*, **63**, 290-298. https://doi.org/10.1111/head.14465

[7] Luppino, F.S., de Wit, L.M., Bouvy, P.F., Stijnen, T., Cuijpers, P., Penninx, B.W.J.H., *et al.* (2010) Overweight, Obesity, and Depression. *Archives of General Psychiatry*, **67**, 220-229. https://doi.org/10.1001/archgenpsychiatry.2010.2

[8] He, R., Zheng, R., Zheng, J., Li, M., Wang, T., Zhao, Z., *et al.* (2022) Causal Association between Obesity, Circulating Glutamine Levels, and Depression: A Mendelian Randomization Study. *The Journal of Clinical Endocrinology & Metabolism*, **108**, 1432-1441. https://doi.org/10.1210/clinem/dgac707

[9] Carrozzino, D., Patierno, C., Fava, G.A. and Guidi, J. (2020) The Hamilton Rating Scales for Depression: A Critical Review of Clinimetric Properties of Different Versions.

Psychotherapy and Psychosomatics, **89**, 133-150.
https://doi.org/10.1159/000506879

[10] Matsui, K., Yoshiike, T., Nagao, K., Utsumi, T., Tsuru, A., Otsuki, R., *et al.* (2021) Association of Subjective Quality and Quantity of Sleep with Quality of Life among a General Population. *International Journal of Environmental Research and Public Health*, **18**, Article 12835. https://doi.org/10.3390/ijerph182312835

[11] Li, L., Wu, C., Gan, Y., Qu, X. and Lu, Z. (2016) Insomnia and the Risk of Depression: A Meta-Analysis of Prospective Cohort Studies. *BMC Psychiatry*, **16**, Article No. 375. https://doi.org/10.1186/s12888-016-1075-3

[12] Zuelke, A.E., Luck, T., Schroeter, M.L., Witte, A.V., Hinz, A., Engel, C., *et al.* (2018) The Association between Unemployment and Depression-Results from the Population-Based Life-Adult-Study. *Journal of Affective Disorders*, **235**, 399-406. https://doi.org/10.1016/j.jad.2018.04.073

[13] Codella, R. and Chirico, A. (2023) Physical Inactivity and Depression: The Gloomy Dual with Rising Costs in a Large-Scale Emergency. *International Journal of Environmental Research and Public Health*, **20**, Article 1603. https://doi.org/10.3390/ijerph20021603

[14] Li, X., Zhang, H., Han, X., Guo, L., Ceban, F., Liao, Y., *et al.* (2023) Predictive Potential of Somatic Symptoms for the Identification of Subthreshold Depression and Major Depressive Disorder in Primary Care Settings. *Frontiers in Psychiatry*, **14**, Article 999047. https://doi.org/10.3389/fpsyt.2023.999047

[15] Haskell, R.M., Frankel, H.L. and Rotondo, M.F. (1997) Agitation. *AACN Clinical Issues: Advanced Practice in Acute and Critical Care*, **8**, 335-350. https://doi.org/10.1097/00044067-199708000-00005

[16] Lee, H., Kim, S. and Chang, M.C. (2023) Associations Between Headache (Migraine and Tension Type Headache) and Psychological Symptoms (Depression and Anxiety) in Pediatrics: A Systematic Review and Meta-Analysis. *Pain Physician*, **26**, E617-E626.

[17] Wang, S., Liu, H., Fuh, J., Liu, C., Wang, P. and Lu, S. (1999) Comorbidity of Headaches and Depression in the Elderly. *Pain*, **82**, 239-243. https://doi.org/10.1016/s0304-3959(99)00057-3

[18] Blomgren, K.J., Sundström, A., Steineck, G. and Wiholm, B. (2006) Interviewer Variability—Quality Aspects in a Case–Control Study. *European Journal of Epidemiology*, **21**, 267-277. https://doi.org/10.1007/s10654-006-0017-7

Appendix: Hamilton Depression Rating Scale

	Pre-treatment	1st Follow-up	2nd follow-up
HAM-D Ratting Scale Symptoms	Date	Date	Date
1 Depressed mood	0 1 2 3 4	0 1 2 3 4	0 1 2 3 4
2 Guilt feelings	0 1 2 3 4	0 1 2 3 4	0 1 2 3 4
3 Suicide	0 1 2 3 4	0 1 2 3 4	0 1 2 3 4
4 Insomnia-early	0 1 2	0 1 2	0 1 2
5 Insomnia-middle	0 1 2	0 1 2	0 1 2
6 Insomnia-late	0 1 2	0 1 2	0 1 2
7 Work and activities	0 1 2 3 4	0 1 2 3 4	0 1 2 3 4
8 Retardation and psychomotor	0 1 2 3 4	0 1 2 3 4	0 1 2 3 4
9 Agitation	0 1 2 3 4	0 1 2 3 4	0 1 2 3 4
10 Anxiety-psychological	0 1 2 3 4	0 1 2 3 4	0 1 2 3 4
11 Anxiety-somatic	0 1 2 3 4	0 1 2 3 4	0 1 2 3 4
12 Somatic symptoms GI	0 1 2 3 4	0 1 2 3 4	0 1 2 3 4
13 Somatic symptoms-General	0 1 2	0 1 2	0 1 2
14 Sexual dysfunction-Menstural disturbance	01 2	01 2	01 2
15 Hypochondriasis	0 1 2 3 4	0 1 2 3 4	0 1 2 3 4
16 Wight loss by history	0 1 2	0 1 2	0 1 2
By scale	0 1 2	0 1 2	0 1 2
17 Insight	0 1 2	0 1 2	0 1 2

Assessment is recommended at two weekly intervals.
HAM-D score level of depression: 10 - 13 mild; 14 - 17 mild to moderate; > 17 moderate to severe.