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Original article

Incidence of depression in chronic low-back pain – A hospital based study

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Abstract

Background: Depression and Chronic Low-back pain (CLBP) are two contrast ailments which affect different parts of a human body. Depression is a psychiatric condition while low-back pain is a distinctly physical condition with many physically presentable symptoms. This study was conducted to investigate the co-morbidity of depression among the patients suffering from chronic low-back pain, who visit an orthopedic surgeon in a hospital of Gujarat, and study the effect of Socio-demographic factors.

Method: Questionnaire based survey of depression in chronic low- back Pain in hospital setting. The study population consisted of patients who visited an orthopedic surgeon for complaint of Chronic low-back pain, having pain for atleast last 3 months, and age 30 years or above.

Result: Out of the 107 patients, 59 patients were found positive for depression using the BDI scale. Hence, 55.14% of people suffering from chronic low-back pain also suffered from clinical depression. This percentage also included the patients in whom there was a presence of confounding factors, and females who were currently going through menopause.

Conclusion: The incidence of depression in CLBP was observed to be 55.14% which is higher than reported in previous studies.

Introduction

Depression and Chronic Low-back pain (CLBP) are two contrast ailments which affect different parts of a human body. Depression is a psychiatric condition while low-back pain is a distinctly physical condition with many physically presentable symptoms.

Research practices indicate that depression and CLBP could be inter-related because both these ailments have been found to co-exist in a lot of patients. The correlation between these two conditions has been studied by researchers since decades but till date no substantial evidence has been able to validate the exact relationship between the two. However, the disease burden of both is significantly towering and it becomes important to understand the relationship between the two[1,2,3]. The lack of clear incidence rates and contrasting results of many researches, keeps the curiosity burning about the ground reality of this co-relation[1,4].

Depression and pain share biological pathways and neurotransmitters, which has implications for the treatment of both concurrently. A model that incorporates assessment and treatment of depression and pain simultaneously is necessary for improved outcomes[5]. A simpler explanation for this is that pessimistic thoughts activate some specific areas in the brain which causes the person to give more attention to the pain and increases the amplitude of pain felt[5].

Epidemiologically, depression and chronic low-back pain are among the most prevalent disorders, worldwide. They can affect both, the young and the old. CLBP is a condition which weakens and disables the person physically, while depression is a disease which can cause disability in the emotional and mental aspects. The disease burden for both these conditions are already very high and are expected to grow in the future[6].

Usually it is noticed that any of these conditions may become the causative factor for the other and can even exacerbate each other[7,8]. Patients with depression often present with a complex set of overlapping symptoms, including emotional and physical complaints. Physical complaints typically include medically unexplained pain[9]. Although it is generally understood that depression and painful symptoms are common co-morbidities and that their combination is costlier and more disabling than each of them alone.

It becomes especially important to understand the liaison between these two conditions, looking at the fact that half of the individuals suffering from major depression fail to be diagnosed by their physicians[3,10] and it has also has been scientifically proved in a minimum of 2 extensive studies that patients with depression who present with physical symptoms such as pain are particularly likely to receive an inaccurate diagnosis[11,12].

The progression of low-back pain for long time would result into many routine changes and

adversely affect the individual's state of mind[13]. The reverse connection, i.e. depression leads to low back pain has been studied by researchers more recently. They have studied how the psychological diseases like depression and anxiety can lead to low back pain in such patients. This two way connection between depression and low back pain has been demonstrated through many studies and one such systematic review of these studies revealed that in adult males, 42% patients suffered primarily from depression which leads to chronic low back pain, while 58% had a reverse cycle of chronic low back pain causing depression[14]. A similar study by Polatin et al. revealed that 39% CLBP patients suffered from depression[15]. While a study by Linton (2000) revealed the other way connection that wherein 14 out of 16 studies indicated that depression increases the chances for development of low back pain[2]. The problem, hence, lies in the fact that in majority of such co-morbid cases, only one out of the two ailments is diagnosed and treated by the physician. The other one remains undetected and hence untreated and it doesnot allow the cure of the diagnosed ailment too. Practically, such treatment failures would be blamed on the non-compliance by the patient and would shift the focus from the ideal treatment. This is frustrating to both the patient and the physician. Therefore, it becomes imperative to assess both physical and psychological cause in order to provide a rational and effective medical treatment[15].

This study was conducted to investigate the co-morbidity of depression among the patients suffering from chronic low-back pain, who visit an orthopedic surgeon in a hospital of Gujarat, and study the effect of Socio-demographic factors.

Method

Study Design was Questionnaire based survey of Depression in Chronic low- back Pain. This project was designed to study the incidence rate of depression in chronic low-back pain patients attending orthopedic OPD.

The study population consisted of patients who visited an orthopedic surgeon for complaint of Chronic low-back pain, having pain for atleast last 3 months and aged 30 years or above. These patients were initially diagnosed for CLBP by the doctor as per his routine practice. They were then screened through the Inclusion /exclusion criteria and those found eligible were then explained about the study and given the Informed consent form to read, understand and sign.

Inclusion Criteria

- Minimum 3 months duration of chronic back pain
- Age 30 years and above (This excludes the early onset depression patients)

Exclusion Criteria

- Severely ill and bed ridden patients of back pain
- Pregnant and lactating females
- History of depression before onset of low-back pain
- Patients who are not able to understand both English and Gujarati language.

Sample size-The probable incidence rate of depression was calculated to be 40% in patients of chronic low-back pain. The allowable error was taken as 20% and the confidence interval was 95%. The design effect for this study was 5. The sample size was calculated from the formula:

N= [4pq/(L)2] x design effect

Here, p is prevalence rate, q is 1-p and L is the all owable error, in this case 0.2.

Hence, Sample size , N = [4x 0.4x 0.6/ (0.2)2] x 5=120.

The study was done in a clinical setting of an orthopedic surgeon. There were three procedures through which a patient would pass if he/she qualifies the inclusion criteria.

1. Diagnosis by Orthopedic surgeon Investigator) – Chronic low-back pain Diagnosis form
2. Briefing session about the study, signing the Informed consent form.- Informed consent form
3. Consultation with Psychiatrist (Investigator) or Trained research personnel (Clinical research co-ordinator) for diagnosis of depression. Involved taking medical and family history, socio-demographics and filling the questionnaires.- Case report form(CRF), BDI-English[16] or Gujarati version.

The patients were free to withdraw their participation from the study at any stage of the study. This study involved only one time contact with the patient for the purpose of the study. Hence, the patients were free to deny from answering the questionnaire even after signing the Informed consent form.

The socio-demographic data of the patient consisted of age, sex, education, occupation, monthly income of family head, type of family (joint/ nuclear) and no. of children. For classification based on Socioeconomic status, Kuppuswamy classification was used. Thus, total 107 patients were enrolled in study over 4

months. The collected data were analyzed with Microsoft office Excel 2007.

Results

Out of 107 patients who participated in this study, 38 were male and 69 female. The age distribution of the patients was as shown in the Table 1.

Table 1: Population distribution as per age and sex

Age group	No of patients	Male	Female
30-40	42	20	22
41-50	23	6	17
51-60	29	8	21
61-70	12	3	9
71-80	0	0	0
80-90	1	1	0
Total	107	38	69

Out of the 107 patients, 59 patients were found positive for depression using the BDI scale. A score of 8 to 15 indicated moderate depression and >15 indicated severe depression. The outcome of the BDI was considered most substantial for the purpose of this study. Patients found positive in BDI and negative in the symptoms checklist were still considered positive for depression. Thus the rate of incidence from BDI was calculated as:

Incidence rate = 59 x 100 / 107 = 55.14%

Out of 107 patients, 52 patients were found positive for depression from the symptoms check list and out of these, 50 patients demonstrated somatic symptoms of depression. 2 patients did not show any somatic symptoms in spite of having diagnosed for depression from the BDI and symptoms checklist.

However considering the criteria for depression diagnosis for this study, 9 patients out of 107 were found depressed. 12 patients were found who were depression positive from BDI but not from the symptoms checklist. However these patients were still considered depressed according to the criteria specified for this study. Hence, 55.14% of people suffering from chronic low-back pain also suffered from clinical depression. This percentage also included the patients in whom there was a presence of Confounding factors, and females who were currently going through menopause.

Confounding factors: The number of patients found positive for depression without presence of confounding factors was 39. The remaining 20 had some or the other co existing confounding factors for depression. These confounding factors were mainly some coexisting chronic diseases like, hypertension, diabetes or other painful conditions. Other confounding factors seen in a few patients were long term disability, social and family issues and recent trauma or surgery.

Out of the 59 patients who were depression positive, 45 were females. The menopausal status of these patients was also recorded. Females having no menopause as well as those having post menopausal period > 5 years were not considered under menopausal depression. Only females with ongoing menopause period or less than 5 years of menopause were considered under menopausal depression. Out of 45 depressed females, 22 were post menopausal women who had >5 years of post menopausal period while 10 females had a current menopause. That is, 22.22% of females with chronic low-back pain had a depression which could be a result of Post menopausal symptoms.

Back pain diagnosis and duration: Out of 59 depressed patients with CLBP, 39 patients were diagnosed with the spinal disorder, Lumbar Spondylosis alone while 10 other had a combined diagnosis of Lumbar spondylosis with other disorders like osteoporosis, Cervical spondylosis, or Spinal canal stenosis. The remaining 10 were diagnosed with other ailments like Slip disc, myofacial back pain, lumbar strain, ankylosing spondylosis, non-specific lowback pain or fibromyalgia. Hence, 49 out of 59, i.e. 83% depressed patients had the diagnosis of Lumbar spondylosis.

Duration of back pain ranged from upto 6 months to > 10 years in the studies sample. 34 out of 59 depressed patients had duration of low back pain upto 1 year while 23 patients were suffering from low back pain since 2 to 5 years. Only 2 patients had duration of low back pain more than 5 years.

Severity and classification of depression: According to the rating given in the abridged BDI scale, a score between 8 to 15 was considered as- Moderate depression, while > 15 was considered as –Severe depression. Patients falling under these two classifications were considered depressed for the purpose of this study. A score of less than 8 on abridged BDI was considered Mild Depression and such patients were not considered depressed. The severity wise classification of the patients is shown in Table 4.2 according to which, 32.7 % of total population studies had mild depression while 22.4% had a case of Severe depression.

Table 2: Severity of Depression and its incidence rate

No. of patients	Mild depression- considered 'not depressed' in the study	Moderate depression	Severe depression
	BDI score - <8	8 to 15	>15
107	48	35	24
Percentage (%)	44.8%	32.7%	22.4%

Table 3: Age groups wise incidence of Depression

Age group	Depressed	Non depressed	Total	Incidence rate (%)
30-40	25	17	42	59.5
41-50	12	11	23	52.1
51-60	15	14	29	51.72
61-70	6	6	12	50
71-80	0	0	0	0
80-90	1	0	1	100
Total	59	48	42	55.14

Sex wise incidence of depression:

Out of 107 patients, 38 were male and 69 were female. Among the 59 depressed patients, 14 were male and 45 were female. In order to calculate the rate of incidence in male and female group, the following formula was used: Incidence rate in x group = (no. of depressed patients in X group/total no. of patients in X group) x 100

By using this equation,

Incidence rate in males: Im = 14/38 x 100 = 36.8%

Incidence rate in females: If = 45/69 x 100 = 65.21%

Hence the incidence rate of depression among male was 36.8% and among female was 65.21%.

Socio-economic status (SES) wise incidence of depression:

Socio-economic status (SES) was calculated from the Kuppuswamy scale for SES. Table 4.4 shows the number of depressed and non depressed patients in each SES class with the incidence rates.

Table 4: SES and incidence of depression

SES class (score)	Lower (<5)	Upper lower (5 - 10)	Lower middle (11-15)	Upper middle(16-25)	Upper(26-29)
Depressed	8	31	15	10	0
Non-depressed	4	21	10	5	3
Total	12	52	25	15	3
Incidence(%)	66.66	59.61	60	66.66	0

The incidence of depression in Lower and upper middle class was 66.66%, in upper lower class was 59.61% whereas in lower middle class it was 60%. The upper class showed 0% incidence rate of depression. However there were only 3 patients falling in this class. Highest number of patients (52) belonged to the Upper lower class. The lower middle class also comprised of 25 patients.

To summarize the results, the primary rate of incidence of depression in CLBP was found to be 55.14% including those with confounding factors. The incidence of probable menopausal depression in females with CLBP was 22.22%. The incidence rates of depression in relation to age, sex and SES class are demonstrated above.

Discussion

Overall good health of an individual depends on two major components: the Mind and the Body. Both these components need to be in harmony with each other in order to achieve a healthy state. Disturbance in any one of the two components would lead to loss of harmony between the two and would have a negative impact on the other component. This is what this study tries to establish.

The incidence rate of depression in chronic low back pain was found to be 55.14%. It was calculated from a simple mathematical formula for percentage. It depicts the extent of co-

morbidity of depression with CLBP. As mentioned above, the relationship between depression and pain is established through this research. This confirms that depression was deeply rooted in the diagnosed patients. Somatic symptoms appear only at a stage when the depressed state starts affecting the biochemical processes of the body which is a sign of severity of depression. However, the incidence rate found by this study is higher than the average incidence rates reported in the literature. The reason for a higher incidence rate could be attributed to a number of factors. The first one is patient population which was majority rural, had less exposure to medical facilities, and had a low literacy level and also majority of population being from lower and upper lower class. These population characteristics itself appear to be vulnerable to depression. Another factor contributing to a high incidence rate is the presence of confounding factors.

Confounding factors, described previously were assessed in the depression positive cases. If we remove the patients with confounding factors from the depression positive cases then the incidence rate of depression happens to be 36.4%. It means that although 55.14% of population suffered from depression, only 36.4% were the confirmed cases of depression and CLBP co-morbidity. The remaining cases of depressed patients may or may not have the CLBP as the root cause of depression. This result indicates that as depression is highly prevalent in CLBP, the presence of other confounding factors is also a common scenario which boosts the incidence of depression.

Limitations of the study

The limitations of this research work were identified as follows:

a. Incomplete patient recruitment -The sample size calculated for the study was 120 patients of CLBP but only 107 patients were recruited during the course of this study. The major limiting factor was the time. The study was conducted over 4 months

b. Restricted population exposure - The study was done in a small region at a total of 3 different centers and the patients were all recruited from only one Orthopedic surgeon.

c. Unequal population distribution - Majority of the population was rural and of the female sex.

The conclusion of this study should be framed while keeping in mind these limitations and its impact on the results.

Conclusion

The incidence of depression in CLBP was observed to be 55.14% which is higher that reported in previous studies. There was a clear presence of confounding factors along with CLBP in depressed as well as non depressed patients which influenced the incidence rate. Socio-demographic factors like age, sex and socioeconomic status were assessed in detail. Age and sex of patients did not affect the incidence of depression in CLBP but the socio-economic status had a considerable influence. The incidence of depression in upper lower class and upper middle class was higher than average, so the patients in these groups must have more contributing factors for depression.

References:

1. Atlas SJ, et al., Evaluation and Treatment of Low back pain: An evidence-based approach to clinical care; *Muscle Nerve ;* 2003;**27:** 265–284
2. Kent PM, Keating JL; The epidemiology of low back pain in primary care; *Chiropractic & Osteopathy ;* 2005;13:13;
3. Tasleem RA, et al,;Chronic Low Back Pain-Comparative analysis of Treatment response to drugs and different physical modalities; *JK-Practitioner2003*;10(3); 201-204
4. Spitzer WO; Scientific approach to the assessment and management of activityrelated spinal disorders: a monograph for clinicians- Report of the Quebec Task Force on Spinal Disorders; Spine 1987; 12(Suppl 7):1–59.
5. Bair MJ, et al; Depression and Pain Comorbidity: A Literature Review; *Arch Intern Med. 2003;*163:2433-2445
6. Murray CJ, Lopez AD. Alternative projections of mortality and disability by cause 1990- 2020: Global Burden of Disease Study. Lancet. 1997; 349:1498-1504.
7. Gallagher RM, Verma S. Managing pain and comorbid depression: a public health challenge. Semin Clin Neuropsychiatry. 1999;4:203-220
8. Blier P, Abbott FV. Putative mechanisms of action of antidepressant drugs in affective and anxiety disorders and pain. J Psychiatry Neurosci. 2001;26:37-43.
9. Katon W, Sullivan M, Walker E. Medical symptoms without identified pathology: relationship to psychiatric disorders, childhood and adult trauma, and personality traits. Ann Intern Med. 2001;134:917-925.
10. Katon W, Sullivan MD. Depression and chronic medical illness. J Clin Psychiatry. 1990;51 (suppl 6):3-11.
11. Bridges KW, Goldberg DP. Somatic presentation of DSM III psychiatric

disorders in primary care. J Psychosom Res. 1985;29:563-569.
12. Kirmayer LJ, Robbins JM, Dworkind M, Yaffe MJ. Somatization and the recognition of depression and anxiety in primary care. Am J Psychiatry. 1993;150:734-741
13. http://www.backpaindetails.com/pain/prognosis-of-back-pain/future-of-backpain/depression-and-chronic-back-pain.htm
14. http://www.spine-health.com /conditions /depression (last accessed Aug 20, 2009)
15. Bruns D.,Disorbio JM; The psychomedical theory behind the BHI 2.;*Health Psychology and Rehabilitation;* Updated May 2004.
16. "Beck Depression Inventory — 2nd Edition". Nova Southeastern University Center for Center for Psychological Studies. Available online at http://www.cps.nova.edu /~cpphelp/BDI2.html