SCREENING FOR CLINICAL DEPRESSION IN IRANIAN POST-MI PATIENTS USING THE BECK DEPRESSION INVENTORY FOR PRIMARY CARE

Reza Bagherian[(1)], Bijan Guilani[(2)], Hadi Bahrami Ehsan[(3)], Hamid Saneei[(4)]

Abstract

INTRODUCTION: Clinical depression is common among post-myocardial infarction (MI) patients. There is a need for a suitable instrument independent of MI characteristics to screen MI patients for depression. The purpose of this study was to ascertain psychometric properties of the Beck Depression Inventory for Primary Care (BDI-PC) in screening for clinical depression (including major and minor depressive disorders) in the post-MI patients who were scheduled for routine office visits with cardiologists.

METHOD: The BDI-PC and hospital anxiety and depression scale (HADS) were administered to 176 post-MI patients admitted to the CCU wards of nine hospitals in Isfahan, Iran. Also the structured interview for DSM-IV, considering DSM-IV criteria for major and minor depressive disorder, was used to diagnose clinical depression.

RESULTS: The internal consistency of the BDI-PC was high (Cronbach's alpha: 0.88), and the construct validity of BDI-PC was confirmed against depression subscale of HADS (r=0.86.8). A BDI-PC cutoff score of 5 and above yielded 91% maximum clinical efficiency with 84% (95% CI 79%-90%) sensitivity and 97% (95% CI 94%-99%) specificity rates, respectively, for identifying patients with and without clinical depression.

CONCLUSION: The BDI-PC proved an effective case-finding instrument in screening for clinical depression in post-MI patients.

Keywords: Myocardial infarction, Depression, Screening, BDI-PC.

***ARYA Atherosclerosis Journal* 2007, 3(3): 168-171**

Date of submission: 11 Aug 2007, ***Date of acceptance:*** 25 Oct 2007

Introduction

Depression, the leading psychological and physical morbidity[1,2] complicates medical management by leading to higher rates of complications, longer length of stay,[3] more cardiac deaths,[4] a higher risk of suicide,[5] and higher social and economic costs per illness episode.[6,7] Earlier studies using brief screening measures (e.g. the Beck's Depression Inventory: BDI) found a wide variation, from 5.5% to 66%, in the rates of depressive disorders among medical patients.[8] This variation stemmed mainly from methodological discrepancies.[9]

Assessment and recognition of depressive disorders in post-MI patients is important, because these are eminently treatable[10] and their treatment prevents additional morbidity.[11,12] Clinicians working with the medically ill realize not only the "normal" reactive depressive symptoms, demoralization, and grief that accompany illnesses,[13] but also the potential interactions between physical illness and depression, including the overlap between symptoms of depression and those of medical illness (for example, tiredness, anorexia and insomnia) and the phenomena of depression arising as a prodrome to or as a consequence of the medical illness.[14,15] Thus, the common

1) PhD. Assistant Professor, Behavioral Sciences Research Center and Department of Psychiatry, School of Medicine, Isfahan University of Medical Sciences, Isfahan, IRAN. e-mail: bagherian@med.mui.ac.ir
2) PhD. Department of Psychology, Tehran University, Tehran, Iran.
3) PhD. Department of Psychology, Tehran University, Tehran, Iran.
4) MD. Assistant Professor, Internal Medicine Dept. School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran.

Corresponding author: Reza Bagherian

depression screening instruments may not be as useful in the assessment of medically ill patients.[16]

An alternative approach has been to distinguish symptoms and other cognitive features that are characteristic of depression in the medically ill.[17] Beck et al.[18] subsequently developed a short version of the BDI by excluding somatic items from the original instrument. BDI-PC[19] has been used in primary and secondary care settings as a case-finding instrument in screening depression for patients with medical problems.[5] Its seven items are drawn from the BDI-II[20] which reflects Diagnostic and Statistical Manual of Mental Disorders, 4th ed. (DSM-IV)[21] criteria for major depressive disorder (MDD).

A review of studies about nine widely used depression-screening instruments by Mulrow et al.[22] indicated that the average rates of sensitivity and specificity were, respectively, 84% and 72%. Several studies have found that the BDI-PC afforded higher rates of specificity for identifying medical patients without MDD than the average rate of 72% that Mulrow et al.[22] reported for the nine instruments.[5] Beck et al.[19] administering the BDI-PC to 50 medical inpatients (16–80 years old) referred for psychiatric consultations found a BDI-PC cutoff score of 4 yielded the highest clinical efficiency with both 82% sensitivity and specificity rates for identifying inpatients with and without MDD. When the BDI-PC was administered to 56 family practice outpatients whose mean age was 48.54 (SD 15.52) years, Beck et al.[18] reported that a BDI-PC cutoff score of 6 and above had sensitivity and specificity rates of 83% and 95%, respectively, for differentiating those with and those without MDD. Steer et al.[5] used the BDI-PC to 60 male and 60 female outpatients and proved the high internal consistency of the BDI-PC (alpha 0.85). They identified a BDI-PC cutoff score of 4 and above yielded 98% maximum clinical efficiency with 97% sensitivity and 99% specificity rates, respectively, for screening patients with and without MDD (likelihood ratios for a positive and negative result of 97 and 0.03, respectively). In their study, the area under the receiver operating characteristic (ROC) curve for the BDI-PC was 0.99 (SE: 0.01), showing that the BDI-PC had a very high level of differentiation. Also, the BDI-PC was used by Winters et al.[23] for 100 adolescents (12-17 years old) receiving pediatric health-maintenance examinations; they found that a BDI-PC cutoff score of 4 and above had both 91% sensitivity and specificity rates respectively, for identifying adolescents with and without MDD.

The purpose of the present study was to determine how effective the Persian version of BDI-PC would be in screening post-MI patients scheduled to be evaluated by cardiologists, for clinical depression.

Materials and Methods

The present study was part of the prediction of post MI depression study, a prospective study of risk factors for depression following MI. 219 consecutive patients with MI admitted to the CCU wards of nine hospitals in Isfahan, Iran, over a 5-month period were screened for this study. Patients were excluded if they had poor cognitive functions, were unable to speak or read Persian, had visual or auditory problems that precluded participation, or could not be scheduled for follow-up visits. In the first three months post-MI, the sample consisted of 176 post-MI patients who could be visited by a clinical psychologist or psychiatrist. The mean age for the sample was 55.9 years (SD=10.05).

Three months after MI, BDI-PC and Hospital Anxiety and Depression Scale (HADS) were completed by the patients. The BDI-PC is a 7-item questionnaire with each item rated on a 4-point scale (0–3). It is scored by summing ratings for each item (range 0-21). Items are symptoms of sadness, pessimism, past failure, loss of pleasure, self dislike, self criticalness, and suicidal thoughts and wishes. To address the minimum DSM-IV requirement for the duration of MDD symptoms (4-24), the respondents were asked to describe themselves on BDI-PC for the "past 2 weeks, including today." The HADS is one of the most widely used instruments to measure anxiety and depression in medical patients; it consists of seven items for anxiety (HADS-A) and seven items for depression (HADS-D). The items are scored on a 4-point scale from 0 (not present) to 3 (considerable). The item scores are added, giving sub-scale scores on the HADS-A and the HADS-D from 0 to 21. In order to be valid in patients with somatic problems, the HADS items were based on the psychological aspects of anxiety and depression. The Iranian version of the HADS proved to be acceptable to Iranian medical patients.[25] The clinicians made their judgment of the presence "clinical depression" on the basis of the DSM-IV criteria by the interview for each patient. The clinicians were not aware of the patients' BDI-PC and HADS scores during the interview.

Statistical analysis involved Cronbach's alpha coefficient for internal consistency and Pearson's correlation for construct validity of the BDI-PC. Discriminate analysis was used to examine optimum values for clinical efficiency, sensitivity, specificity and an appropriate cut-off score for case finding of post-MI depression.

Results

The mean BDI-PC score for the total sample of 176 post MI patients was 4.8 (SD=4.37), and the mean BDI-PC score was 8.52 (SD=3.55) for the 82 (46.6%) post-MI patients who were diagnosed with clinical depression. The mean BDI-PC score of the 82 post-MI patients with clinical depression was approximately 5.1 times higher than the mean BDI-PC score (M=1.66, SD=1.68) of the 94 post-MI patients without clinical depression.

Cronbach's alpha coefficient of internal consistency for the BDI-PC was 0.88. Construct validity of BDI-PC was calculated by using HADS. The BDI-PC correlated positively with depression subscale of HADS (r=86.8).

The results of Wilk's lambda (0.384) (F=278.91, df2=174, P=0.000) showed that the depressed group was significantly different from the non-depressed group. Also Eigenvalue was 1.603 and canonical correlation as the differential discriminant coefficient was 0.785 and the results showed that the determinant coefficient was 0.61 (P<0.05).

To determine which BDI-PC cutoff score simultaneously yielded the highest rates of both sensitivity and specificity with respect to a diagnosis of clinical depression (i.e., afforded the maximum rate of accurate classification or clinical efficiency), a discriminant analysis was next conducted. Finally the results of discriminant analysis demonstrated that the BDI-PC had a high level of differentiation. Furthermore, a BDI-PC cutoff score of 5 and above yielded the highest maximum clinical efficiency of 91% with a sensitivity rate of 84% (95% CI 79%-90%) and specificity of 97% (95% CI 94%-99%) for identifying post-MI patients with and without clinical depression.

Discussion

This is the first study evaluating the efficacy of BDI-PC in screening Iranian patients to detect depression. The findings demonstrated that the Iranian version of BDI-PC was an acceptable, reliable and valid scale for detecting depression in post-MI patients. The BDI-PC correlated positively with depression subscale of HADS. The HADS items were based on the psychological aspects of anxiety and depression. The validity f the Iranian version of HADS had earlier been shown.[25] The present results confirmed that the internal consistency of the BDI-PC is high (alpha coefficient=0.88). The overall pattern of results supports similar findings about the clinical utility of the BDI-PC with respect to medical inpatients,[19] family practice outpatients,[18] and pediatric adolescent outpatients.[23] However, the main aim of this study was to determine the cutoff point for clinical depression in Iranian patients. The main finding of this study was that BDI-PC with cutoff score of 5 had acceptable ability for use as a screening instrument for post-MI depression.

Importantly, a BDI-PC score of 5 and above had 91% maximum clinical efficiency with 84% sensitivity and 97% specificity, respectively, for identifying post-MI patients diagnosed with and without clinical depression. This was approximately close to BDI-PC cutoff score that yielded the maximum clinical efficiency in screening for MDD in Beck et al.[19] study with inpatients, Steer et al.[5] study, and Winter et al.[23] study of adolescent outpatients. However, the minimal difference between the cutoff point we calculated and the cutoff point determined by Beck,[18,19] Steer[5] and Winters[23] might be due to difference in sample size (the sample size of this study was bigger than those of their studies), difference in patients included in this study, and the prevalence of clinical depression among MI patients (the prevalence of clinical depression in MI patients was found to be higher than that described in other medical patients).

It should also be noted that clinical depression (including major and minor depression) was used in this study to determine the cutoff point, hence the results were expectable. Furthermore, although the prevalence of clinical depression in the present sample was 46.6%, a BDI-PC cutoff score of 5 and above would have afforded a 91% maximum clinical efficiency in screening for clinical depression, even if the underlying prevalence of clinical depression had ranged from 10% to 50%. The current specificity of 97% for a BDI-PC cutoff score of 5 and above is obviously much higher than the average rate of 72% reported by Mulrow et al.[22] for nine other case-finding instruments widely used to screen for depression in medical patients. However, Beck et al.[18] found that a BDI-PC cutoff score of 6 and above yielded maximum clinical efficiency with family practice outpatients of whom 39% had no medical disorder.

Consequently, Iranian physicians are advised to employ BDI-PC cutoff score guidelines that are based on their own personal knowledge of their patients. For example, if a physician wants to minimize the possibility of falsely identifying a patient as depressed during a routine physical examination, then he or she should raise the cutoff score to 5 or 6 and above. In any event, the overall pattern of the BDI-PC symptom ratings should also be carefully reviewed, especially the rating for item #7 about suicidal thoughts and ideas. High BDI-PC scores only indicate that a detailed psychiatric evaluation may be warranted.

Also, Iranian physicians are advised to use BDI-PC cutoff score of 5 and above for primary screening, and then to conduct an interview with the patients having score of 5 and above. However, it should be noted that high BDI-PC scores only indicate that a detailed psychiatric evaluation may be warranted. There is evidence confirming that the structured interview for DSM-IV (SCID-IV)[26] that was especially developed to diagnose DSM-IV Axis I disorders is suitable for diagnosing psychiatric disorders.

Although, the present study suggests that the BDI-PC is a clinically useful instrument in screening for clinical depression in post MI patients, future research needs to ascertain whether medical patients who have been identified by the BDI-PC with cutoff score of 5 as possibly having clinical depression are confirmed as having depression when the DSM-IV is used. The psychometric characteristics of the BDI-PC should also be studied in patients drawn from a broad spectrum of different medical settings and different cultures. Obviously, the clinical utility of BDI-PC should be investigated with patients representing different socioeconomic backgrounds than those studied here.

Two limitations of this study deserve comment. First, we have no data on two potential confounders, namely, pre-MI psychiatric morbidity such as other mood disorders, addiction and alcohol abuse, while the main purpose of this study was to examine the clinical efficiency of the Persian version of BDI-PC in screening only clinical depression. Secondly, the sample consisted of only MI patients assessed by BDI-PC. Our findings should thus be considered within the context of these limitations.

References

1. Rost K, Zhang M, Fortney J, Smith J, Coyne J, Smith GR Jr. Persistently poor outcomes of undetected major depression in primary care. Gen Hosp Psychiatry 1998;20:12–20.
2. Cassem E. Depressive disorders in the medically ill. Psychosomatics 1995; 36(S2–S10).
3. Koenig HG, George LK, Peterson BL, Pieper CF. Depression in medically ill hospitalized older adults: prevalence, characteristics, and course of symptoms according to six diagnostic schemes. Am J Psychiatry 1997;154:1376–1383.
4. Glassman AH, Shapiro PA. Depression and the course of coronary artery disease. Am J Psychiatry 1998;155:4–11.
5. Steer RA, Cavalieri TA, Leonard DM, Beck AT. Use of the Beck Depression Inventory for Primary Care to screen for major depression disorders: Gen Hosp Psychiatry 1999;21:106–111.
6. Henk HJ, Katzelnick DJ, Kobak KA, Greist JH, Jefferson JW. Medical costs attributed to depression among patients with a history of high medical expenses in a health maintenance organization. Arch Gen Psychiatry 1996;53:899–904.
7. Covinsky KE, Kahana E, Chin MH, Palmer RM, Fotinsky RH, Landefeld CS. Depressive symptoms and 3-year mortality in older hospitalized medical patients. Ann Intern Med 1999; 130: 563–569.
8. Meakin, CJ. Screening for depression in the medically ill. The future of paper and pencil tests. Br J Psychiatry 1992; 160: 212–216.
9. Rodin G,Voshart K. Depression in the medically ill: an overview. Am J Psychiatry. 1986;143:696–705.
10. Sheikh J I, Cassidy EL, Doraiswamy P, Salomon R M, Hornig, M,Holland PJ, et al. Efficacy, Safety, and Tolerability of Sertraline in Patients with Late-Life Depression and Comorbid Medical Illness. J Am Geriatrics Soc 2004; 52(1): 86-92.
11. Dickens CM, Percival C, McGowan L, Douglas J, Tomenson B, Cotter L, Heagerty A, Creed, FH. The Rrisk Factors for Depression in First Myocardial Infarction Patients. Psychol Med 2004; 34(6): 1083-92.
12. Spijkerman TA, van den Brinka RHS, Jansena, JHC, Crijnsc HJG, Ormela JHC. Who is at risk of post-MI depressive symptoms? Journal of Psychosomatic Research. 2005;58:425– 432.
13. Clarke DM, Mackinnon AJ, Smith GC, McKenzie DP, Herrman HE. Dimensions of psychopathology in the medically ill. Psychosomatics 2000; 41: 418–425.
14. Kathol RG, Noyes R JR, Williams J, Mutgi A, Carroll B, Perry P. Diagnosing depression in patients with medical illness. Psychosomatics 1990;31: 434–440.
15. Hughes DH. Management of suicidal and aggressive patients in the medical setting, in Psychiatric Care of the Medical Patient. Edited by Stoudemire A, Fogel BS, Greenbery D. New York, Oxford University Press 2000; 283–299
16. Wilhelm K, Beth Kotze FRANZCP, Waterhouse M, Hadzi-Pavlovic D & Parker G. Screening for Depression in the Medically Ill: A Comparison of Self-Report Measures, Clinician Judgment, and DSM-IV Diagnoses. Psychosomatics 2004; 45(6):461- 469.
17. Clark DC, vonAmmon Cavanaugh S, Gibbons RD. The core symptoms of depression in medical and psychiatric patients. J Nerv Ment Dis. 1983;171:705–713.
18. Beck AT, Steer R, Ball R, Ciervo CA, Kabat M. Use of the Beck Anxiety and Depression Inventories for Primary Care with medical outpatients. Assessment 1997; 4: 211–219.
19. Beck AT, Guth D, Steer RA, Ball R. Screening for major depression disorders in medical inpatients with the Beck Depression Inventory for Primary Care. Behav Res Ther 1997; 35: 785–791
20. Beck AT, Steer RA, Brown GK. Manual for Beck Depression Inventory-II. San Antonio, TX, Psychological Corporation 1996.
21. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders, 4th Ed. Washington DC. American Psychiatric Association 1994.
22. Mulrow CD, Williams JW, Gerety MB, Ramirez G, Montiel OM, Kerber C. Case finding instruments for depression in primary care settings. Ann Intern Med 1995; 122: 913–921.
23. Winter L, Steer RA, Jones-Hicks L, Beck AT. Screening for major depression disorders with the Beck Depression Inventory for Primary Care in adolescent medical outpatients. J Adoles Hlth 1999; 24: 389-394.
24. Katon W, Schulberg HC. Epidemiology of depression in primary care. Special section: Developing guidelines for treating depressive disorders in the primary care setting. Gen Hosp Psychiatry. 1992;14: 237–247.
25. Montazeri A, Vahdaninia M, Ebrahimi M, Jarvandi S. The Hospital Anxiety and Depression Scale HADS): translation and validation study of the Iranian version. Health Qual Life Outcomes 2003; 28: 14-19.
26. First MB, Spitzer, RL, Gibbon M, Williams JBW. Structured Clinical Interview for DSM-IV Axis I Disorders. New York, Biometrics Research Unit, New York Psychiatric Institute 1995.