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Comparison of four brief depression screening instruments in ovarian cancer patients: Diagnostic accuracy using traditional versus alternative cutpoints

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HIGHLIGHTS

- The diagnostic accuracy of different depression screening methods was compared
- A two-phase scoring approach using a cutpoint of 6 on the PHQ-9 performed best.
- The CES-D (cutpoint = 16) performed worst, with a positive predictive value of 5%.
- The one-item screener "Are you depressed?" missed 80% of all true depressed cases.
- The results were similar when analyzed with patients not on antidepressants

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ABSTRACT

Objectives. We compared the diagnostic accuracy of 4 depression screening scales, using traditional and alternative scoring methods, to the gold standard Structured Clinical Interview-DSM IV major depressive episode (MDE) in ovarian cancer patients on active treatment.

Methods. At the beginning of a new chemotherapy regimen, ovarian cancer patients completed the following surveys on the same day: the Center for Epidemiological Studies Depression Scale (CES-D), the Beck Depression Inventory Fast-Screen for Primary Care (BDI-FastScreen), the Patient Health Questionnaire-9 (PHQ-9), and a 1-item screener ("Are you depressed?"). Each instrument's sensitivity, specificity, positive predictive value (PPV) and negative predictive value were calculated with respect to major depression. To control for antidepressant use, the analyses were re-run for a subsample of patients who were not on antidepressants.

Results. One hundred fifty-three ovarian cancer patients were enrolled into the study. Only fourteen participants met SCID criteria for current MDE (9%). When evaluating all patients regardless of whether they were already being treated with antidepressants, the two-phase scoring approach with an alternate cutpoint of 6 on the PHQ-9 had the best positive predictive value (PPV = 32%). Using a traditional cutpoint of 16 on the CES-D resulted in the lowest PPV (5%); using a more stringent cutpoint of 22 resulted in a slightly improved but still poor PPV, 7%.

Conclusions. Screening with a two-phase PHQ-9 proved best overall, and its accuracy was improved when used with patients who were not already being treated with antidepressants.

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1. Introduction

Untreated major depression is a critical issue in cancer patient care and survivorship. Research has shown that untreated depression is associated with longer hospital stay [1], increased pain [2], reduced adherence to treatment [3,4], compromised immune functioning [5,6], and possibly decreased length of survival [7].

When compared with liaison psychiatrists consulting the same patients, oncologists tend to miss most cases of major depression, with study concordance rates of 23% [8]. With respect to oncologists' attitudes toward depression screening, studies consistently show that oncologists lack confidence in their ability to distinguish between the somatic-based symptoms of depression (loss of appetite, fatigue, and psychomotor retardation) and side effects of cancer treatment and the disease itself [9]. Another frequently cited barrier is the lack of time during oncology treatment visits [9].

There is a need for an efficient method to reliably detect clinically significant depressive disorders. However, since clinicians lack the training and time to conduct rigorous DSM-based interviews with all of their patients, the next best option may be to use a screening instrument as a first-line approach to detect previously undiagnosed cases of depression. Screening tools are designed to maximize sensitivity, i.e., the likelihood of detecting the presence of a condition among all screened patients. By maximizing sensitivity, actual cases of a condition are not mistakenly missed within the screened population. The Institute of Medicine IOM and National Comprehensive Cancer Network NCCN currently recommend routine screening of all cancer patients for distress and depression, provided follow-up care systems are available. However distress screening in oncology settings has not been widely implemented due to a) most screening instruments have high false positive rates, b) lack of consensus as to the best screening instrument, and c) lack of resources for follow-up after a positive screen test result.

To counter the problem of false positive test results and the unnecessary medical costs that are subsequently engendered, screening instruments should not only have high sensitivity, but also high positive predictive value, (PPV). PPV is a critical parameter for determining the accuracy of a screening test and is defined as the likelihood that a person with a positive test result in fact truly has the disease. Positive predictive values are based upon both the screening test's sensitivity and, indirectly, its specificity. Specificity refers to the ability of a test to correctly rule out the presence of disease among all patients who are screened. While high sensitivity is to be desired in a screening tool, specificity is also important, in that the more specific the screening method, the less likely an individual who is in actuality disease-free will be falsely identified as having the disease and subsequently referred for additional diagnostic testing.

Few studies compare the performance of various screening instruments against a gold-standard, Structured Clinical Interview using Diagnostic Statistical Manual criteria (SCID)-derived diagnosis of major depressive episode (MDE). As a whole, screening instruments for depression are not interchangeable and have considerable variance in sensitivity, specificity and positive predictive values, which in turn have yielded wide ranges in estimates of probable major depression in cancer patients, 1 to 53% [10]. Other sources of measurement variability include variability in cancer site, and timing of depression assessment [11,12].

To investigate the performance of brief and ultra-brief screening methods in an oncological setting, we tested the performance of 4 brief screening instruments representing different approaches (the Fastscreen BDI, the CESD, a simple 1-item question, "Are you depressed?" and the PHQ-9) against a diagnosis of MDE using the DSM-IV SCID in patients who were attending treatment or surveillance visits for ovarian cancer. Because a significant proportion of our sample (25%) were already being treated with antidepressants at the time of enrollment, and since previous studies had shown that screening efficiency decrease as rates of antidepressant treatment increase within the screened sample [13,14], all analyses were then repeated among the subsample of ovarian cancer patients who were not already being treated with antidepressant medication.

We chose to study depression in ovarian cancer patients because treatment and symptom profiles for ovarian cancer overlap with many of the risk factors for depression in cancer: Most women are first diagnosed at an advanced stage of disease, when 5-year survival rates are severely compromised. Treatment for ovarian cancer is often aggressive, requiring repeated regimens of chemotherapy [15–17]. Some studies have found significantly higher levels of depression in ovarian cancer patients compared with patients that have other gynecological cancers [18]. While a few studies have found elevated distress ranging from 23 to 33% in ovarian cancer patients [16,19,20], the prevalence of major depression in ovarian cancer patients using the gold standard of clinical interviews has not been reported.

1.1. Participants

Following Institutional Review Board Approval, ovarian cancer patients beginning a new chemotherapy regimen were enrolled into the study. Patients were eligible if they: a) were beginning a new chemotherapy treatment regimen for ovarian cancer; c) at least 18 years of age; d) spoke and read English; e) were oriented;) had no other cancer diagnoses; and g) had a Zubrod performance status of 0–3.

1.2. Design

Patients were identified prior to their first chemotherapy appointment of a new cycle through online medical record. At the time of the clinical consultation with their gynecologic oncologist or nurse, the patient was approached for recruitment either in the waiting room. After eligibility was confirmed, the rationale and description of the study were presented and informed consent was obtained if the participant agreed to participate. Participants were prospectively enrolled within the first 3 weeks of a new chemotherapy regimen, which typically lasted 4.5 months.

Telephone SCID interviews were scheduled in advance with the participant, usually 1–2 weeks after the initial consent so that participants would have a chance to recover from the first administration of chemotherapy. The sequence of the depression screening instruments was randomized according to a computerized randomization program (packets were prepared in advance, with screeners placed in randomized order). All screening tools were administered on paper and the SCID was administered via telephone interview on the same day. While participants were allowed to complete other parts of the questionnaire before or after the scheduled SCID telephone interview, they were asked to complete the screening portion of the questionnaire on the same day. If participants indicated that they had not completed the screening instruments on the day of the telephone call, the interviewer gave them 15–20 min to complete this section of the questionnaire before calling back to initiate the SCID- depression modules. Previous studies have shown concordance of telephone-administered diagnostic interviews with face-to-face interviews for assessment of depression [21]. To control for experimenter bias, the interviewer was blinded to the results of the depression screening instruments.

1.3. Diagnostic and screening instruments for MDE

1.3.1. 1-item depression screening instrument

"Are you depressed (yes or no)?" has been reported to have 100% sensitivity and 100% specificity in validation studies done with terminally ill patients [22]. However, this one-item measure has not been validated in ambulatory cancer patients. This screening method was scored dichotomously.

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