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Research report

Increased health burden associated with comorbid depression in older Brazilians with diabetes

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ABSTRACT

Background: The health burden associated with comorbid depression and diabetes in older community residents in middle income countries is unclear.
Methods: Data came from a statewide representative sample (N = 6963, age ≥ 60) in Brazil. Controlled polytomous logistic regression was used to determine whether four mutually exclusive groups (all possible combinations of the presence or absence of depression and diabetes) differed in sociodemographic characteristics, social resources, health behaviors, and selected health conditions.
Results: While 2.37% were expected to have comorbid depression/diabetes given sample base rates (depression: 20.92% [1457/6963]; diabetes: 11.35% [790/6959]), comorbidity was present in 3.62% (52.5% beyond expectation; P < 0.0001; OR = 1.58, 95% Confidence Interval 1.29–1.95). Depression without diabetes was reported by 17.3%, and diabetes without depression by 7.7%. In controlled analyses, the depression group had poorer socioeconomic status and health behaviors, and a greater likelihood of vascular, respiratory, and musculoskeletal problems than the diabetes group. Vascular, respiratory, and urinary problems were exacerbated in comorbid depression/diabetes; the comorbid group was also more likely to be female and younger.
Limitations: Cross-sectional design.
Conclusions: To our knowledge, this is the first study that explicitly reports on all four possible depression/diabetes combinations in an older representative community-resident sample, using controlled analyses to identify unique associations with sociodemographic characteristics and other health conditions. The burden of comorbid depression/diabetes in Brazil, a middle income country, appears to be comparable to that found in higher income countries. So, similarly, depression without diabetes had a greater odds of adverse sociodemographic and health conditions than diabetes without depression; comorbid depression/diabetes was more likely in women and young elderly, and the odds of vascular, respiratory, and urinary conditions was increased significantly. Attention to comorbid depression/diabetes as a unique entity is needed.

1. Introduction

Depression and diabetes frequently co-occur in both clinical and general population samples (Katon, 2010). As indicated from studies in developed countries, this co-occurrence is manifested by a complex of symptoms leading

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to clinically significant impairment, and increased mortality (Egede et al., 2005). As best we can determine, information on depression/diabetes comorbidity based on representative community surveys in middle-income countries has not been published, and consequently it is unclear whether experience in those countries is comparable to that in developed countries. In addition, obesity, a major risk factor for diabetes, is increasing world-wide, making awareness of the implications of comorbid depression and diabetes more urgent.

Studies of depression/diabetes comorbidity focusing specifically on elderly populations are relatively infrequent, have typically used small clinically-based samples, and have rarely controlled for the simultaneous presence of other disorders although the elderly tend to have multiple health conditions (Marengoni et al., 2009). Additionally, few studies in the elderly have specifically examined whether comorbid depression/diabetes is associated with an increased socioeconomic or health burden compared to patients diagnosed with either one or neither of these disorders.

The present investigation addresses these issues in a middle income country – Brazil – using data from a statewide survey: *The elderly of Rio Grande do Sul*, sponsored by the State Council on Aging (Conselho Estadual do Idoso, 1997). The representativeness and size of the study enable us to examine the association of comorbid depression/diabetes with socioeconomic status, disability, and selected medical conditions in older persons. In particular, this study allows us to determine whether depression/diabetes comorbidity has a different clinical expression compared to three comparison groups: diabetes present, depression absent; depression present, diabetes absent; neither present. Theoretically, we anticipate differences in the clinical expression of comorbid depression/diabetes as compared to the three comparison groups, since there is evidence from molecular studies (Kumar et al., 2009), that these groups have different physiopathological mechanisms. In addition, we expect a declining gradient of socioeconomic status and health across the four groups, with the best socioeconomic and health status present when both depression and diabetes are absent, followed by successively poorer status among those with (a) diabetes but no depression (since type 2 diabetes, the more prevalent form, is likely to occur later in life), (b) depression but no diabetes (because of the known adverse association between depression and diverse health conditions), and the poorest situation among (c) persons with comorbid depression/diabetes.

2. Methods

2.1. Sample

This study used data from a state-wide representative sample of non-institutionalized persons aged 60 years and over in the state of Rio Grande do Sul, Brazil. All respondents completed a face-to-face household survey administered by health professionals, who had received study-specific training and completed practice interviews before beginning field work. Details of the study design have been published previously (Blay et al., 2007). Briefly, 7040 persons were approached. No proxy information was collected, and 1.1% did not take part in the assessment, mainly refusals, yielding an overall response rate of 99%. The final sample consisted of 6963 subjects. Of this group, self-reported information on depressive symptomatology was reported by 6963 subjects, and on diabetes by 6959 subjects. All subjects gave oral consent. Recruitment and consent procedures were approved by the ethics committee of the Federal University of São Paulo.

2.2. Primary dependent variables

2.2.1. Depression

The presence of depression was determined by the six-item Short Psychiatric Evaluation Schedule (Short-SPES) (Blay et al., 1988), designed for the older Brazilian population. Each interviewer-administered question requires a yes/no answer from the respondent regarding the presence of the symptom in the past 30 days. The questions ask: Does it seem that no one understands you?, whether the interviewee couldn't "get going", was happy most of the time, felt useless at times, felt weak all over much of the time, and whether troubled by heart pounding and shortness of breath. The total score reflects the number of positive answers, yielding a potential scoring range of 0–6. A score of 2 or greater identifies a "psychiatric case" with a sensitivity of 82% and specificity of 77%. To improve specificity (*i.e.*, reduce the likelihood of misclassifying noncases), we applied a more rigid criterion of 3 or more symptoms. A study of inter-rater reliability showed complete agreement between examiners. Performance on the Short-SPES is not affected by sex, age, marital status, income, education, or minority status. Of the 6963 subjects, 1457 (20.9%) were identified as depressed.

2.2.2. Diabetes

Respondents were asked whether in the last 6 months they had been treated for or received a diagnosis of diabetes (Yes/No); 790 participants (11.4%) reported such treatment or diagnosis. Self-report of diabetes has been found to agree well with information on medical records (Kriegsman et al., 1996; Okura et al., 2004).

2.2.3. Depression/Diabetes classification

The sample was classified into four all-encompassing, mutually exclusive, non-overlapping groups: no depression and no diabetes (Depression and Diabetes absent); diabetes present, no depression (called Diabetes only, but health conditions other than depression could be present); no diabetes, depression present (called Depression only, other health conditions could be present); both depression and diabetes present (Depression + Diabetes).

2.2.3.1. Covariates. The sample is large, but because of the number of comparisons anticipated, we tried to select only the most relevant covariates, as determined by previously identified associations with depression or diabetes. The number of covariates was further reduced in preliminary analyses.

2.2.4. Sociodemographics

The sociodemographic characteristics examined were gender, age (60–69, 70+), ethnicity (Caucasian, African Brazilian, and other), education (<4 years *vs.* ≥4 years), income (< twice the monthly minimum wage [MW] *vs.* ≥2 MW).