Prevalence of depressive disorders in the elderly

Ankur Barua,[a] Mihir Kumar Ghosh,[b] Nilamadhab Kar,[c] Mary Anne Basilio[d]

From the [a]Department of Community Medicine, Melaka-Manipal Medical College (MMMC), Melaka, Malaysia, [b]Department of Community Medicine, Sikkim-Manipal Institute of Medical Sciences (SMIMS), Sikkim, India, [c]Department of Psychiatry, Corner House Resource Centre, Wolverhampton, United Kingdom, [d]Department of Psychology & Psychological Counselling, Saint Mary's University of Bayombong, Nueva Vizcaya, Philippines

Correspondence: Dr. Ankur Barua · Department of Community Medicine, Melaka-Manipal Medical College (MMMC), Jalan Batu Hampar, Bukit Baru, 75150 Melaka, Malaysia · T: +60122569902 · ankurbarua26@yahoo.com · Accepted: October 2010

Community-based mental health studies have revealed that the point prevalence of depressive disorders in the elderly population of the world varies between 10% and 20%, depending on cultural situations. A retrospective study based on analysis of various study reports was conducted, to determine the median prevalence rates of depressive disorders in the elderly population of India and various other countries in the world. All the studies that constituted the sample were conducted between 1955 and 2005. Included are only community-based, cross-sectional surveys and some prospective studies that had not excluded depression at baseline. These studies were conducted on a homogenous community of the elderly population in the world, who were selected by a simple random sampling technique. After applying the inclusion and exclusion criteria on published and indexed articles, 74 original research studies that surveyed a total of 487 275 elderly individuals, in the age group of 60 years and above, residing in various parts of the world, were included for the final analysis. The median prevalence rate and its corresponding interquartile range were calculated. The chi-square test and chi-square for linear trend were applied. A P value of <.05 was considered as statistically significant. The median prevalence rate of depressive disorders in the world for the elderly population was determined to be 10.3% (interquartile range [IQR], 4.7%-16.0%). The median prevalence rate of depression among the elderly Indian population was determined to be 21.9% (IQR, 11.6%–31.1%). Although there was a significant decrease in the trend of world prevalence of geriatric depression, it was significantly higher among Indians, in recent years, than the rest of the world.

The World Health Organization estimated that the overall prevalence rate of depressive disorders among the elderly generally varies between 10 and 20%, depending on the cultural situations.[1,2] The community-based mental health studies in India have revealed that the point prevalence of depressive disorders in elderly Indian population varies between 13% and 25%.[3,4] Although India is the second-most populated country in the world, in terms of elderly population of 60 years and above,[1,2] elderly depression is not yet perceived as a public health problem in India. Very few community-based studies have been conducted in India so far to address this issue.

PATIENTS AND METHODS

We performed a retrospective study based of the prevalence of depressive disorders in the elderly population, including community-based mental health surveys on depressive disorders in the elderly, conducted in the continents of Asia, Europe, Australia, North America, and South America. All the studies published in indexed journals between 1955 and 2005 (i.e., within the last 51 years) constituted the sample. It normally took around 2-to-3 years for a project report to get accepted and published in an indexed journal. Therefore, publication of a study conducted during 2005 was expected in an indexed journal by the year 2008. The sample size for this project was finalized during the year 2008. All published articles on the prevalence of depressive disorders in the elderly population that were available, and adequately analyzed and accessible from

the internet, at the Central Library of Kasturba Medical College Manipal, in Karnataka and the Central Library of Sikkim-Manipal Institute of Medical Sciences (SMIMS), in Sikkim, constituted the study universe. The search engines that were utilized for electronic data from the internet were MEDLINE, PUBMED, GOOGLE, YAHOO, EMBASE, PsycINFO, and the Cochrane Collaboration Database for original human research articles in the English literature published from January, 1, 1955 through December 31, 2005, using two sets of search items: 'prevalence of depression in elderly' and 'prevalence of geriatric depression'.

Only studies that either covered the total population of the study area or applied the simple random sampling method to identify the study subjects in their corresponding research projects were included for this final analysis. To avoid undesired bias due to design effects from various epidemiological study designs, we had included only community-based, cross-sectional surveys on the prevalence of depressive disorders and some prospective study designs that had not excluded depression at baseline. All these studies were conducted on a homogenous community of the elderly population in the world, who were either selected by the simple random sampling technique or covered under the whole population of the study area. For determining the various correlates of depression in the elderly, only those articles were included that had studied at least one risk factor of depression. All unpublished reports and unavailable or unanalyzed or inaccessible articles from the internet, as well as the Central Library of Kasturba Medical College Manipal, in Karnataka, and the Central Library of the Sikkim–Manipal Institute of Medical Sciences (SMIMS), Sikkim, on studies regarding the prevalence of depressive disorders in the elderly population were excluded from this study. However, it was perceived by the researchers that the proportion of excluded reports, on account of inaccessibility or unavailability, would constitute less than 5% of the available articles on the relevant topic. Hence, this was expected to have minimal impact on the final results. Studies, where the 95% confidence interval of the prevalence rate estimation exceeded more than 20 units, were excluded on account of possible improper sample size estimation. Studies conducted on migrant populations, old-age homes, and health care institutions were also excluded from this analysis in order to avoid bias. A high prevalence rate of depression was very common among isolated groups of individuals in the community, who had migrated to some other place, either due to political force or to meet their physiological or financial needs.

In the first step, while searching through all the selected databases, the key words 'depression,' 'prevalence', 'elderly', 'geriatric' and 'aged' and the text word 'community' were used. In the second step, after applying the inclusion and exclusion criteria, all the relevant articles (judged on the basis of the title and abstract) were retrieved for more detailed evaluation. In the third step, the bibliographies of the relevant articles were searched for additional references. Finally, all the retrieved articles were screened, to determine which met the following six inclusion criteria: (1) original research published in English, (2) study group of community residents, (3) subjects age 60 years or older, (4) cross-sectional study design that included both old and new cases of depressed elderly individuals in the community, (5) prospective or follow-up studies that had not excluded the depressed elderly individuals at the baseline, and (6) acceptable definition of depression (either recognized diagnostic criteria or cut-off on a depression rating scale).

Clinical diagnoses by psychiatrists were based on DSM-III-R, DSM IV, and ICD-10 criteria. Other standardized study instruments used were Elderly Mental State Examination (GMS), AGECAT, Composite International Diagnostic Inventory (CIDI-SF), CES-D, BDI, HDS, Yesavage Elderly Depression Scale, Center for Epidemiologic Studies Depression Scale, Mini Mental Status Examination (MMSE), Hamilton Depression Scale (HDS/HAMD), Clinical Rating Scale for Depression, Mini Mental Status Examination and Elderly Depression Screening Scale, and Mastering Depression In Primary Care, Version 1998. The validity of each of these study instruments was verified with its individual validity and reliability reports and reconfirmed by psychiatrists. Some of the studies used the clinical assessment by individual psychiatrists and the diagnostic criteria were never mentioned. In these cases, the impact factor of the journal where the research article got published was taken into consideration, for assessing the quality and standard of research. The investigators were trained by psychiatrists of the Kasturba Medical College Manipal, Karnataka, and the Sikkim–Manipal Institute of Medical Sciences (SMIMS), on how to interpret the results from different community-based psychiatric evaluation studies. The diagnoses generated by the questionnaires used as study instruments were kept strictly confidential and reconfirmed by consulting the senior psychiatrists, for confirmation of their acceptability, content validity, and reliability, before arriving at a final diagnosis for data analysis.

At the start, a pilot study was conducted with randomly chosen data from 25 original research articles that surveyed elderly individuals in the age group of 60

years and above, residing in various parts of the world. After applying the inclusion and exclusion criteria, some of these studies used in the pilot study, were included for statistical analysis in the final research project.

Anytime a relevant article was found inaccessible on the internet or in the designated libraries, all attempts were made to contact the corresponding author(s) through postal letters, telephone, fax or email and they were asked to provide the investigators with a soft or hard copy of that article. If after five repeated attempts, over one year, the investigators failed to procure a relevant article, then it was considered as unavailable and excluded from the final analysis.

Information about the size of the study group, subjects' age, sampling method, criteria for depression, exclusion criteria at baseline, length of the study period, and number of prevalent cases of depression was abstracted from each report. The collected data was tabulated and analyzed using the statistical package SPSS (Statistical Package for Social Sciences) version 10.0 for Windows and EPI INFO version windows 2000. The findings were described in terms of median prevalence rates of depressive disorders in the elderly and their corresponding interquartile range (IQR). Proportions and 95% confidence intervals (CI) were used for the same purpose. The chi-square test and chi-square for linear trend were applied for studying the prevalence rates of elderly depressive disorders among various countries in the world and in India. A P value of <.05 was considered as statistically significant.

RESULTS

The search strategy yielded 896 potentially relevant studies; from these, 143 were retrieved for more detailed evaluation. Although 77 studies met the inclusion criteria, we could retrieve the main article or structured abstract for only 74 studies, which were included for the final analysis. Therefore, only three (4%) potentially relevant studies could not be included, due to their lack of inaccessibility and unavailability of relevant information elsewhere. Among these 74 selected articles, which formed the study universe for this analysis of depression in the elderly, 69 (93.2%) had a cross-sectional study design and five (6.8%) had a prospective study design that had not excluded depression at baseline.

Two analysis reports, one by Chen R et al.,[5] on 10 relevant studies and another by Copeland et al.,[6] on 14 relevant studies, and also a systematic review report by Beekman et al.,[7] on 34 relevant studies were included in this review. Therefore, this study had actually taken into consideration the prevalence rates of depression in the elderly from [74+(10+14+34)=132] survey reports from various parts of the world. The investigators obtained a full text version of 44 (59.5%) articles and they retrieved structured abstracts with relevant data from 17 (23.0%) articles. Even though the investigators could not directly retrieve the reports of 13 (17.6%) important studies, the relevant information on these studies was obtained from the introduction and parts of the discussion of the full text versions of some of the retrieved articles. A report from the selected 74 articles was used for estimation of the median prevalence of depression in the elderly. All other studies were excluded for the following reasons: many did not meet the age criterion, many did not provide detailed information on the criteria for confirmation of diagnosis and standard case-definition, many were institution-based studies or conducted on a migrant population, some study designs were not cross-sectional, some had inadequate sample size or a faulty sampling technique, some were prospective studies that had excluded depression at baseline, and some did not meet two or more of the inclusion criteria.

The 74 included studies involved 487 275 elderly individuals from all parts of the world at baseline. Among these, six studies from India involved only 2499 (0.5%) elderly individuals at baseline, for assessment of presence of depression. The mean ages of the study population were reported in 68 (85.1%) articles with the mean ranging from 62 to 71 years. Sixty-eight (91.9%) articles included gender distribution and 36% to 64% of the participants were men (median=46%). The length of the reported study period ranged from 3 to 84 months (median=9).

Only 52 (70.3%) studies used some of modern rating scales for diagnosis of depression in the elderly. Among these, 14 used AGECAT/GMS-AGECAT, four used DIS/HDS, eight used GMS/GDS, 11 used CES-D, and 15 used the DSM/ICD criteria for the diagnosis of geriatric depression. Although some studies had used more than one rating scale of depression, only the superior rating scale among these was included as the diagnostic instrument for each study. The prevalence rate of geriatric depression was found to be higher in studies using psychiatric examination and operational definitions, and the studies used the Geriatric Depression Scale (GDS) or Geriatric Mental State Schedule (GMS) alone.

The median prevalence rate of depressive disorders in the world for the elderly population from the 74 studies was determined to be 10.3% with an ±QR varying between 4.7% and 16.0%. Similar findings were reported by Kirby et al.,[8] (1997, Dublin) and Kay et al.,[9] (1985, Hobart). Studies conducted by Geerlings

systematic review

et al.,[10] (1990-1996, Amsterdam), Newman et al.,[11] (1998, Canada), Liu et al.,[12] (1993, China), also reported the prevalence rate of depression among the elderly to be 10.5%, 11.2%, and 12.9%, respectively. The comparison of the median prevalence rates of depression in the elderly population of India and the rest of the world was also studied. It was found that the proportion of the depressed elderly population in India (18.2%) was significantly higher than the rest of the world (5.4%) and this difference was found to be statistically highly significant (x^2=770.4 and P=.000000001).

DISCUSSION

Although there is an alarming increase in the proportion of depressed elderly in India, we must also keep in mind that there were only six relevant studies available from India, covering only 0.5% of the elderly participants of the world as compared to 68 studies from the rest of the world covering 99.5% of the participants. The low prevalence of depression in the elderly during recent years could be due the presence of better diagnostic instruments with optimum validity, and reliability has developed in recent years when diagnosing elderly depression in the community to rule out cases of dementia, which had often been falsely diagnosed as depression in the past. The technological advancements in recent years, in health care delivery systems, including mental health, also provide adequate health support systems, improving the quality of life for the elderly. However, a high prevalence in the past could be attributed to the fact that the study instruments that were applied during the years 1955 to 1984 were not specially devised to specifically detect depression in the community and they could have falsely identified more cases of dementia as depressive disorders. A majority of these studies relied on clinical diagnosis and operation definition, where the cut-off level for the identification of geriatric depression was lower.

As there has been a population explosion in many of the developing countries in the world, including India, in recent years, we also need to keep in mind the number of depressed elderly individuals who would require adequate mental health care. Although a lower prevalence rate of geriatric depression was recorded in recent years, there was an alarming increase in the number of elderly individuals suffering from depression, which had a booming eight-fold increase from the period 1955-1984 to 1995-2005, and this trend was also found to be statistically highly significant. Although there was a significant decreasing trend in the world prevalence of geriatric depression, depression was significantly higher among Indians in recent years, than the rest of the world.

The comparison of depressive disorders in the elderly population of various continents of the world was also undertaken. Due to unavoidable circumstances, no study from the African continent was available for this analysis. However, the findings suggested that the median prevalence rates of depression in the elderly were similar in Asia, Europe, and America, but it was significantly lower in Australia. Here, we should keep in mind that only three studies were available from Australia, which covered only 0.4% of the elderly population of the world. Although the proportion of elderly individuals affected with depression was significantly lower in Asia (4.2%) than Europe (10.9%) and America (8.4%), the number of depressed elderly individuals was significantly higher in Asia, which was evident from 14 studies conducted in various Asian countries. Studies from developing countries like India had reported a very high prevalence rate of 21.9% with an IQR ranging from 11.6 to 31.1. Care and bonding from family support systems, less competitive lifestyles, and improved mental health facilities, with their integration with primary health care, could account for lesser prevalence rates in some of the developed Asian countries.[1,2,4]

Dementia often acts as a major confounder in cross-sectional studies on screening for depressive disorders in the elderly. It is an established fact that the prevalence of depressive disorders is often found to be high among individuals suffering from other mental disorders, especially dementia, and cognitive impairment. A significantly high prevalence of cognitive impairment among depressed individuals was reported by Liu et al.,[12] (1993, China), Kay et al.,[9] (1985, Hobart), and Newman et al.,[11] (1998, Canada), respectively. Schoevers et al.,[10] (1990-97, Amsterdam) had reported a significant risk of mortality due to depression among individuals concomitantly suffering from epilepsy or Parkinson disease.

Differentiating depression from dementia in the elderly is extremely complicated. Depression, subcortical dementia, and normal aging may all have similar neurobehavioral manifestations. It has to be borne in mind that a major depressive disorder has a significant impact on cognition. Patients with cortical dementia (irreversible dementia) have normal speech volume, but their language is impaired by a transcortical sensory aphasia-like syndrome. Patients with depression (reversible dementia) can be hypophonic, but will have normal language. They have a forgetful memory pattern, but can learn new information.[9,13]

Using inattentiveness as a key index of depression is a mistake, because patients with depression do not largely have attention disturbance. Verbal fluency is a

slightly better indicator when trying to separate depression from normal aging. The disturbance of mental flexibility is one cognitive defect that is characteristic of people with major depression. Research in this field reveals that older adults with major depression are between two and three times more likely, over a three-year period, to develop Alzheimer disease or other irreversible dementia. For this reason, follow-up is essential in case of an individual suffering from depressive disorder.

When in doubt, it is always advisable to also investigate the patient for dementia.[13]

The coexistence of cognitive impairment and depressive symptoms is of considerable interest. The complaints of subjective impairment of memory are more characteristic of depression than that of dementia. With cross-sectional data, it is not possible to comment on the changes that may take place in one, in parallel with progression or remission in the other.[9]

REFERENCES

1. Rangaswamy SM. World Health Report: Mental Health: New understanding New Hope. Geneva, Switzerland: The World Health Organization; 2001
2. Wig NN. World Health Day, 2001. Indian J Psychiatry 2001;43:1-4.
3. Nandi DN, Ajmany S, Ganguli H, Banerjee G, Boral GC, Ghosh A. The Incidence of mental disorders in one year in a rural community in West Bengal. Indian J Psychiatry 1976;18:79-87.
4. Ramachandran V, Menon Sarada M, Arunagiri S. Socio-cultural factors in late onset Depression. Indian J Psychiatry 1982;24:268-73.
5. Chen R, Copeland JR, Wei L. A Meta-analysis of epidemiological studies in depression of older people in the People's Republic of China. Int J Geriatr Psychiatry 1999;14:821-30.
6. Copeland JR, Beekman AT, Braam AW, Dewey ME, Delespaul P, Fuhrer R, et al. Depression among older people in Europe: The EURODEP studies. World Psychiatry 2004;3:45-9.
7. Beekman AT, Copeland JR, Prince MJ. Review of community prevalence of depression in later life. Br J Psychiat 1999;174:307-11.
8. Aisling D, Kirby M, Bruce I, Cunningham C, Coakley D, Lawlor BA. Three-year prognosis of Depression in the community-dwelling elderly. Br J Psychiatry 2000;176:453-7.
9. Kay DW, Henderson AS, Scott R, Wilson J, Rickwood D, Grayson DA. Dementia and depression among the elderly living in the Hobart community: The effect of the diagnostic criteria on the prevalence rates. Psychol Med 1985;15:771-88.
10. Schoevers RA, Geerlings MI, Beekman AT, Penninx BW, Deeg DJ, Jonker C, et al. Association of Depression and gender with mortality in old age. Br J Psychiatry 2000;177:336-42.
11. Newman SC, Bland RC, Orn HT. The prevalence of mental disorders in the elderly in Edmonton: A community survey using GMS-AGECAT. Can J Psychiatry 1998;43:910-4.
12. Liu CY, Wang SJ, Teng EL, Fuh JL, Lin CC, Lin KN, et al. Depressive disorders among older residents in a Chinese rural community. Psychol Med 1997;27:943-9.
13. Blackmun S. Is it Depression or is it Dementia. Psychiatric Times 1998;15:3.