Coll. Antropol. **30** (2006) Suppl. 2: 85–88
Original scientific paper

Prevalence of Moderate and Severe Depression among Croatian Patients Infected with Human Immunodeficiency Virus

Branko Kolarić[1], Vanja Tešić[2], Davor Ivanković[3] and Josip Begovac [4]

[1] Croatian National Institute of Public Health, Zagreb, Croatia
[2] Zagreb Public Health Institute, Zagreb, Croatia
[3] »Andrija Štampar« School of Public Health, Zagreb, Croatia
[4] University Hospital for Infectious Diseases »Dr. Fran Mihaljević«, Zagreb, Croatia

A B S T R A C T

The aim of the study was to assess the prevalence of depression among Croatian patients infected with human immunodeficiency virus (HIV) and to make a comparison with patients with other acute and chronic infectious diseases. We assessed the depressive disorder using the Beck Depression Inventory questionnaire (BDI), without clinical confirmation. The BDI scores were examined in 80 HIV-infected persons and compared to 80 persons with chronic viral hepatitis and 78 with acute infectious diarrhea. All examinees were treated as outpatients at the University Hospital for Infectious Diseases in Zagreb in March and April of 2003. Prevalence of moderate and severe depression among HIV-infected was 16/80 (20%) with a 95% confidence interval 11% to 29%. Male patients with HIV or chronic viral hepatitis had a significantly higher BDI scores than males with acute infectious diarrhea (p=0.017, Kruskall-Wallis, d.f. 2). Female patients with HIV infection tended to have a lower BDI score than females with chronic viral hepatitis or acute infectious diarrhea (p=0.087, Kruskall-Wallis, d.f. 2). Prevalence of moderate and severe depression among Croatian HIV-positive patients is higher than the upper estimate for general population. Croatian males with chronic infectious disease have higher rate of depression than those with acute infectious disease.

Key words: *prevalence, depression, human-immunodeficiency-virus, Croatia, viral hepatitis*

Introduction

According to the latest report more than 40 million people worldwide is infected with HIV[1]. In countries where antiretroviral treatment is available it is expected that HIV-infected patients will be able to live otherwise a healthy live for many years. As with other serious illnesses such as cancer, heart disease or stroke, HIV-disease can often be accompanied by depression, an illness that can affect mind, mood, body and behavior[2,3]. Treatment of depression helps people to manage both diseases, thus enhancing survival and quality of life. Infected individuals face the prospect of social stigma, long-term physical discomfort and illness, and eventual death. Depression is often not recognized and begins to affect many people at a relatively young age. It is an increasing burden of health care system[4,5], hence examining the rate of depression is of considerable interest.

There was no previous estimate of the prevalence of depression among Croatian adult population with HIV infection. The aim of this study was to estimate the prevalence of moderate and severe depression among Croatian HIV-infected patients and to make a comparison to patients with chronic and acute infectious diseases. As an example of a chronic infectious disease we chose chronic viral hepatitis (any type of hepatitis virus). Previous studies in USA, UK, Germany and France have shown a relatively high prevalence of depression (range: 16% to 35%) in individuals with chronic viral hepatitis[6–10]. On the contrary, we could not find any reference

Received for publication November 2, 2006

on the association of acute infectious diarrhea (as an example of acute infectious disease) with increased depression rate. We tested the hypothesis that there was no difference in BDI scores between the three groups defined by their infectious disease.

Patients and Methods

All of the examinees were recruited from the Outpatient Department of the University Hospital for Infectious Diseases in Zagreb, where all Croatian HIV-infected are treated. The individual had to have confirmed HIV-infection with a Western-blot antibody test and had to be at least 18 years old. Exclusion criteria were an active opportunistic infection or actual major psychiatric disorder. 83 consecutive patients were approached, of whom 80 were included in the study. One patient was excluded due to opportunistic infection and two refused to participate in the study so the final response rate was 80/83. The study was conducted between 1st March to 30th April of 2003.

We assessed depression using the Beck Depression Inventory (BDI) instrument. The BDI is a self-administered 21 item self-reported scale measuring supposed manifestations of depression. The BDI score between 9 and 18 implies mild to moderate depression, between 19 and 30 moderate to severe depression, and over 30 severe depression[11]. Due to somatic nature of some symptoms of depression (insomnia, loss of appetite, loss of weight, fatigability) that could be caused by some other diseases/conditions, it is usual to analyze total BDI score and BDI score without somatic symptoms[11]. We did not do clinical confirmation of depressive disorder.

We administrated the same questionnaire to patients with chronic viral hepatitis (three of 83 eligible refused to complete the questionnaire, response rate 80/83.), and to the patients with acute infectious diarrhea as an example of acute infectious disease (five out of 83 eligible refused to participate, response rate 78/83). They were recruited the same way as HIV-patients at the same hospital and in the same period of time. The calculation of the sample size was based on a 20% of prevalence of depression with an 18% confidence interval width and 0.05 level of significance[12]. We got approval to conduct the study from the Ethical board of the University Hospital for Infectious Diseases in Zagreb.

Statistics

The outliers were checked for entering errors and were not excluded from further analysis[13]. We used the Shapiro-Wilk's test for checking the assumption of normality and Levene's test for checking the assumption of homogeneity of variance. Due to the absence of normality and homoscedasticity, we used rank-sum tests for testing differences between groups: Kruskall-Wallis test for three groups and Mann-Whitney U test for two groups[14]. We chose $\alpha = 0.05$ as a level of significance. For comparing two-by-two groups the Bonferroni correction was used to avoid error due to multiple comparisons[15]: all p values were multiplied with the number of compared group which was 3. The analysis was performed by Epi Info, version 3.2, provided by the Centers for Disease Control and Prevention, Georgia, USA (http://www.cdc.gov/epiinfo/downloads.htm).

Results

The median age of 80 HIV-infected patients was 39 years (range 12.5). The median of BDI score was 8.5 (range 13.75). Sixty-five out of 80 (81%) examinees were males and 64 out of 80 (80%) had taken highly-activated-antiretroviral-therapy (HAART). The median of age among 80 examinees with chronic viral hepatitis group was 38.5 years (range 20.5) and the median of BDI score was 9 (range 18). Fifty-four out of 80 (68%) were males. The median age of 78 patients with acute infectious diarrhea was 36 years (range 24). The median of BDI score was 6 (range 9) and 46 out of 78 (59%) were males (Table 1).

Age and BDI scores were not normally distributed (both p values less than 0.001, Shapiro-Wilk's). There was no statistically significant difference between groups regarding age (p=0.264, Kruskall-Wallis, d.f. 2). Due to the difference in gender distribution between groups (p=0.009, Kruskall-Wallis, d.f. 2) we stratified out analysis by gender (Figure 1).

TABLE 1
MEDIANS OF BECK DEPRESSION INVENTORY SCORES (RANGE) IN PATIENTS WITH HIV INFECTION, CHRONIC HEPATITIS C AND ACUTE INFECTIOUS DIARRHEA

	HIV-patients		CVH-patients		AID-patients	
	males (N=65)	females (N=15)	males (N=54)	females (N=26)	males (N=46)	females (N=33)
Total BDI score	9 (14)*	6 (18)†	8 (17)	14 (19)	5 (13)	9 (7)
BDI score without somatic symptoms	6 (10)‡	4 (11)§	6 (10)	8 (16)	1 (4)	4 (4)

*p=0.017 and ‡p<0.001, comparison of scores in males, Kruskall Wallis test, d.f.=2.
† p=0.087 and § p=0.068, comparison of scores in females, Kruskall Wallis test, d.f.=2
BDI – Beck Depression Inventory, HIV – Human immunodeficiency virus, CVH – Chronic viral hepatitis,
AID – Acute infectious diarrhea

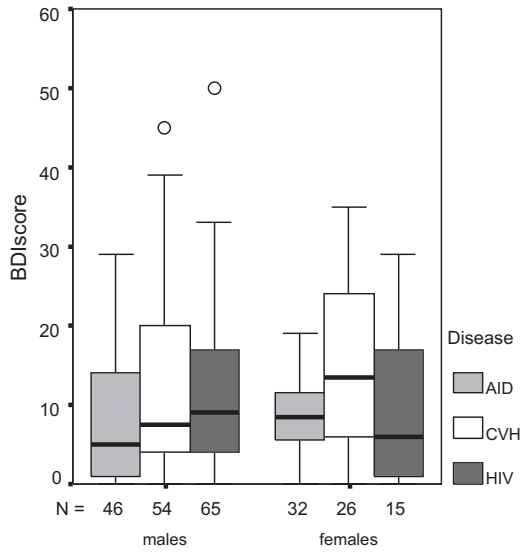

Fig. 1. Boxplot of total Beck depression index (BDI) scores among males (p=0.017, Kruskall-Wallis, d.f. 2) and females (p=0.087, Kruskall-Wallis, d.f. 2). Medians, quartiles, minimum-maximum ranges and outliers are presented. Grouping variable: infectious disease – Acute infectious diarrhea (AID), Chronic viral hepatitis (CHV), Human immunodeficiency virus (HIV).

Prevalence of moderate to severe depression (BDI score >18) among HIV-infected patients was 16/80 (20%) with 95% confidence interval (CI) 11% to 29%. Prevalence of severe depression (BDI>30) was 4/80 (5%) with 95% CI 0.3% to 9.7%.

We failed to reject the null hypothesis (there was no difference in total BDI score between three groups) in the female stratum (p=0.087, Kruskall-Wallis, d.f. 2). However, in the male stratum we found a statistically significant difference among BDI scores (p=0.017, Kruskall-Wallis, d.f. 2). We also compared 2 by 2 groups in the male stratum and found a significantly higher BDI score in the HIV-group compared to the acute infectious diarrhea group (p=0.034, Mann-Whitney U with Bonferroni correction), and in the chronic viral hepatitis compared to the acute infectious diarrhea group (p=0.036, Mann-Whitney U with Bonferroni correction). There was no significant difference between HIV and chronic viral hepatitis groups (p=0.94, Mann-Whitney U).

When we compared the distributions of BDI scores without somatic symptoms between the three groups similar results were observed: statistical significance was not achieved for females (p=0.068, Kruskall-Wallis, d.f. 2), while in the male stratum we found a statistically significant difference (p <0.001, Kruskall-Wallis, d.f. 2). When we compared 2 by 2 groups in the male stratum, we found again a significantly higher BDI score without somatic symptoms in the HIV-group compared to the acute infectious diarrhea group (p<0.001, Mann-Whitney U with Bonferroni correction), and in the chronic viral hepatitis group compared to the acute infectious diarrhea group (p=0.005, Mann-Whitney U with Bonferroni correction). There was no significant difference between HIV and chronic viral hepatitis groups (p=0.7, Mann-Whitney U) (Table 1).

Discussion

We found that the prevalence of moderate to severe depression in HIV-infected patients in Croatia is 20% with a 95% CI 11% to 29% which is higher than the upper estimate for the general population (10%)[5]. Unfortunately, there are no population studies on depression prevalence in Croatia, so we used the World Health Organization estimate which is general and with no stratification according to different subtypes of depression. Depression seems to be one of the main causes of poor adherence to anti-retroviral therapy[16]. It should be detected and treated as soon as possible because of the potential risk of attempted or successful suicide[17,18]. Both depression and potential suicide attempts could become an important problem for health care providers[5,19].

Over the past 15 years, numerous studies estimated the prevalence of depression, particularly major depressive disorders, in HIV-positive individuals[20,21]. These rates differed dramatically, from 0%[22] to 48%[23]. Many studies concluded that HIV infection is not associated with a higher rate of depressive disorder[22,24–29]. On the other hand, other studies and meta-analytic studies as well, provided strong evidence that HIV infection is associated with greater risk for major depressive disorder[23,30,31]. It is almost impossible to make a precise comparison of those prevalence rates because there is no unique and simple method of depression diagnosis. The most accurate diagnostic of depression is a structured clinical interview which is time consuming and difficult to perform in a routine practice. We used the Beck Depression Inventory in our study because it is a standardized questionnaire easy to interpret; it has been widely used for a long period of time and; it is simple to perform and a useful screening test.

Due to the gender distribution in our sample and known differences in depression prevalence between males and females in some populations[5], we stratified our analysis by gender. However, there is lot of inconsistency regarding gender and the prevalence of depression in different populations[5,22–31].

Our study has several limitations. A larger case-control or cohort study is needed to quantify the crude risk of developing depression in people with chronic infectious diseases and investigate possible cause-effect. It would be also interesting to make a more detailed investigation of the association of various characteristics of the chronic infectious disease (for example: prognosis, social stigma, adverse effect of therapy, etc.) to depressive disorders. Hence, we might have neglected some possible confounders in our study such as other comorbidities. For the estimation of the prevalence rate we used a convenient sample which could have also introduced a selection bias. Another difficulty is to compare studies on depression prevalence due to different depression diagnostics and lack of age standardization among patients with chronic infectious diseases.

Despite these limitations, our study is of good informative value and we have shown that depression is an important co-morbidity in Croatian patients suffering from chronic hepatitis and HIV disease. It should be recognized and treated appropriately.

Acknowledgments

The authors thank to Antun Beus, Kornelija Gedike, Tanja Grdic, Ivan Kurelac, Vedran Pazur, Tamara Poljicanin and Adriana Vince for their invaluable help in conducting this study.

REFERENCES

1. UNAIDS/WHO: AIDS epidemic update, Special report on HIV Prevention. (UNAIDS, Geneva, 2005). — 2. RODIN, G., K. VOSHART, Am. J. Psychiatry., 143 (1986) 696. — 3. KATON, W., H. SCHULBERG, Gen. Hosp. Psychiatry, 14 (1992) 237. — 4. GREENBERG, P. E., L. E. STIGLIN, S. N. FINKLESTEIN, E. R. BERNDT, J. Clin. Psychiatry, 54 (1993) 419. — 5. WHO: The World health report 2001: Mental health: new understanding, new hope. (WHO, Geneva, 2001). — 6. MADDOCK, C., A. BAITA, M. G. ORRU, R. SITZIA, A. COSTA, E. MUNTONI, M. G. FARCI, B. CARPINIELLO, C. M. PARIANTE, J. Psychopharmacol., 18 (2004) 41. — 7. FOTIADOU, M., M. LIVADITIS, I. MANOU, E. KANIOTOU, M. SAMAKOURI, N. TZAVARAS, K. XENITIDIS, Eur. Addict Res., 10 (2004) 56. — 8. KRAUS, M. R., A. SCHAFER, H. FALLER, H. CSEF, M. SCHEURLEN, J. Clin. Psychiatry, 64 (2003) 708. — 9. POYNARD, T., P. CACOUB, V. RATZIU, R. P. MYERS, M. H. DEZAILLES, A. MERCADIER, P. GHILLANI, F. CHARLOTTE, J. C. PIETTE, J. MOUSSALLI, J. Viral. Hepat., 9 (2002) 295. — 10. HUNT, C. M., J. A. DOMINITZ, B. P. BUTE, B. WATERS, U. BLASI, D. M. WILLIAMS, Dig. Dis. Sci., 42 (1997) 2482. — 11. BECK, A. T., C. H. WARD, M. MENDELSON, J. MOCK, J. ERBAUGH, Gen. Psychiatry, 4 (1961) 561. — 12. HULLEY, S. B., S. R. CUMMINGS, W. S. BROWNER, D. GRADY, N. HEARST: Designing clinical research. (Lippincott Williams & Wilkins, Philadelphia, 2001). — 13. PETRIE, A., C. SABIN: Medical statistics at a glance. (Blackwell Publishing, Oxford, 2000). — 14. RIFFENBURGH, R. H.: Statistics in medicine. (Academic Press, San Diego, 1999). — 15. DAWSON-SAUNDERS, B., R. G. TRAPP: Basic and clinical biostatistics. (Appleton & Lange, East Norwalk, Conneticut, 1990). — 16. SINGH, N., C. SQUIER, C. SIVEK, M. WAGNER, M. HONG NGUYEM, V. L. YU, AIDS Care, 8 (1996) 261. — 17. MALBERGIER, A., A. G. ANDRADE, AIDS Care, 13 (2001) 141. — 18. BRENARD, R., Acta. Gastroenterol. Belg., 60 (1997) 211. — 19. LAVIKAINEN, J., E. LATHINE, V. LLETHINEN (Eds.): Public health approach on mental health in Europe. (STAKES, National Research and Development, Centre for Welfare and Health, Finland, 2000). — 20. MAJ, M., Br. J. Psychiatry, 30 (1996) 117. — 21. CRUESS, D. G., D. L. EVANS, M. J. REPETTO, D. GETTES, S. D. DOUGLAS, J. M. PETITTO, Biol. Psychiatry., 54 (2003) 307. — 22. FUKUNISHI, I., T. MATSUMOTO, M. NEGISHI, M. HAYASHI, T. HOSAKA, H. MORIYA, Psychother. Psychosom., 66 (1997) 248. — 23. DEW, M. A., J. T. BECKER, J. SANCHEZ, R. CALDARARO, O. L. LOPEZ, J. WESS, S. K. DORST, G. BANKS, Psychol. Med., 27 (1997) 395. — 24. RABKIN, J. G., S. J. FERRANDO, L. B. JACOBSBERG, B. FISHMAN, Compr. Psychiatry, 38 (1997) 146. — 25. ATKINSON, J. H., I. GRANZ, C. J. KENNEDY, Arch. Gen. Psychiatry, 45 (1988) 859. — 26. CHUANG, H. T., G. W. JASON, E. M. PAJURKOVA, M. J. GILL, Can. J. Psychiatry, 37 (1992) 109. — 27. KELLY, B., B. RAPHAEL, F. JUDD, M. PERDICES, G. KERNUTT, G. D. BURROWS, P. C. BRUNETT, M. DUNNE, Aust. NZ. J. Psychiatry, 32 (1998) 441. — 28. PERKINS, D. O., R. A. STERN, R. N. GOLDEN, C. MURPHY, D. NAFTOLOWITZ, D. L. EVANS, Am. J. Psychiatry, 151 (1994) 233. — 29. RABKIN, J. G., Int. Rev. Psychiatry, 8 (1996) 157. — 30. LAW, W. A., A. MARTIN, A. M. SALAZA, R. L. MAPOU, Neuropsychiatry Neuropsychol. Behav. Neurol., 6 (1993) 181. — 31. CIESLA, J. A., J. E. ROBERTS, Am. J. Psychiatry, 158 (2001) 725.

B. Kolarić

Croatian National Institute of Public Health, Rockefellerova 7, 10000 Zagreb, Croatia
e-mail: branko.kolaric@hzjz.hr

PREVALENCIJA UMJERENO TEŠKE I TEŠKE DEPRESIJE U HRVATSKIH BOLESNIKA ZARAŽENIH HIV-OM

SAŽETAK

Cilj istraživanja bio je utvrditi učestalost depresije u hrvatskih bolesnika zaraženih virusom humane imunodeficijencije (HIV) te usporediti s učestalošću u bolesnika s drugom akutnom i drugom kroničnom bolešću. Prevalenciju smo procijenili korištenjem Beck Depression Inventory upitnika (BDI), bez kliničke potvrde dijagnoze. Zbroj BDI bodova utvrđen je u 80 bolesnika zaraženih HIV-om te uspoređen s 80 osoba oboljelih od kroničnog virusnog hepatitsa i 78 oboljelih od akutnog infektivnog proljeva. Svi ispitanici bili su ambulantni klijenti Klinike za infektivne bolesti »Dr. Fran Mihaljević« iz Zagreba u ožujku i travnju 2003. g. Učestalost umjereno teške i teške depresije u HIV-om zaraženih osoba bila je 16/80 (20%) uz 95% interval pouzdanosti 11% do 29%. Muški ispitanici zaraženi HIV-om ili kroničnim virusnim hepatitisom imali su statistički značajno viši zbroj BDI bodova od muškaraca oboljelih od akutnog infektivnog proljeva (p=0,017, Kruskall-Wallis, d.f. 2). Žene zaražene HIV-om imale su niži zbroj BDI bodova od žena zaraženih kroničnim virusnim hepatitisom ili akutnim infektivnom proljevom (p=0,087 Kruskall-Wallis, d.f. 2). Učestalost umjerene do teške depresije u hrvatskih bolesnika zaraženih HIV-om je veća nego gornja procjena za opću populaciju. Muškarci s kroničnom zaraznom bolešću imaju višu učestalost depresije od onih s akutnom zaraznom bolešću.