Lilian R C Ratto[I]

Paulo R Menezes[II]

André Gulinelli[II]

Prevalence of tobacco use in individuals with severe mental illnesses, São Paulo, Brazil

Prevalência de tabagismo em indivíduos com transtornos mentais graves, São Paulo, Brasil

ABSTRACT

OBJECTIVE: To analyze the prevalence of cigarette smoking in individuals with severe mental illnesses in a large urban centre of a middle income country.

METHODS: Cross-sectional study carried out in São Paulo. The sample (N=192) comprised individuals diagnosed with severe mental illnesses who had contact with public psychiatric care services from September to November 1997 and were aged between 18 and 65 years. Prevalence of daily tobacco smoking in the 12 months previous to the interview and characteristics associated were studied.

RESULTS: Out of 192 subjects with severe mental illnesses interviewed, 115 (59.9%; 95% CI: 52.6%; 66.9%) reported smoking cigarettes on a daily basis. Male gender, marital status separated or widowed, irregular use of neuroleptic drugs and history of ten or more psychiatric admissions were independently associated with cigarette smoking.

CONCLUSIONS: The prevalence of cigarette smoking in the present sample was higher than that found in the general Brazilian population. Mental care services should implement non-smoking policies and mental health providers need to help patients with severe mental illness who want to quit smoking.

KEY WORDS: Mentally ill persons. Diagnosis, dual (Psychiatry). Mental disorders, epidemiology. Tobacco use disorder, epidemiology. Mental health services. Cross-sectional studies.

[I] Centro de Atenção Integrada à Saúde Mental. Santa Casa de Misericórdia de São Paulo. São Paulo, SP, Brasil

[II] Departamento de Medicina Preventiva. Faculdade de Medicina. Universidade de São Paulo. São Paulo,SP, Brasil

Correspondence:
Paulo Rossi Menezes
Departamento de Medicina Preventiva
Faculdade de Medicina da Universidade de São Paulo
Av. Dr. Arnaldo, 455
01246-903 São Paulo, SP, Brazil
E-mail: pmenezes@usp.br

Received: 6/7/2006
Reviewed: 1/4/2007
Approved: 3/14/2007

RESUMO

OBJETIVO: Analisar a prevalência de tabagismo em amostra de indivíduos com transtornos mentais graves em um grande centro urbano de um país emergente.

MÉTODOS: Estudo transversal realizado no município de São Paulo. A amostra (N=192) foi composta por indivíduos com diagnóstico de transtorno mental grave que tiveram contato com serviços psiquiátricos do setor público de setembro a novembro de 1997 e tinham idade entre 18 e 65 anos. O uso diário de cigarro nos 12 meses anteriores à entrevista e as características associadas a esse consumo foram investigados.

RESULTADOS: Dos 192 indivíduos com transtornos mentais graves entrevistados, 115 (59,9%; IC 95%: 52,6%;66,9%) referiram ter feito uso diário de cigarros. Ser do sexo masculino, ser separado ou viúvo, fazer uso irregular de neurolépticos e ter história de dez ou mais internações anteriores mostraram-se independentemente associados ao tabagismo.

CONCLUSÕES: A prevalência de tabagismo na amostra de indivíduos com transtornos mentais graves foi maior que a encontrada na população geral brasileira. Serviços de saúde mental devem promover políticas anti-fumo e profissionais de saúde mental devem ajudar os portadores de transtornos mentais graves que desejarem parar de fumar.

DESCRITORES: Pessoas mentalmente doentes. Diagnóstico duplo (Psiquiatria). Transtornos mentais, epidemiologia. Transtorno por uso de tabaco, epidemiologia. Serviços de saúde mental. Estudos transversais.

INTRODUCTION

Over the past decade, several studies in developed countries have reported higher prevalence of cigarette smoking among people with severe mental illnesses than in the general population.[4,7,8,11,18,20] The former group consumes more cigarettes per day and is less likely to quit smoking than smokers in the general population.[11,20] There is evidence that individuals with schizophrenia have higher mortality rates from cardiovascular diseases and cancer than the general population and the high prevalence and amount of smoking may be one of the reasons for such higher mortality rates.[2,4,7,8]

Cigarette smoking is also a risk factor for dyskinesia regardless of exposure to antipsychotic medication.[15] Data on prevalence of cigarette smoking among people with severe mental illnesses are scarce in low and middle income countries. A recent study[3] carried out in Colombia also found higher prevalence of cigarette smoking among individuals with schizophrenia, even though the general population had low smoking prevalence. On the other hand, a study carried out in India[19] found that the prevalence of current smoking among those with diagnosis of schizophrenia was very similar to that of the general population. The authors argued that lack of financial independence might explain such finding, through restrictions imposed by the families of those with severe mental illnesses. In Brazil, high financial dependence is also common among people with severe mental illnesses,[13] and the prevalence of substance misuse among them is much lower than that observed in developed countries.[14] Therefore, the prevalence of cigarette smoking people with severe mental illnesses may not follow the pattern seen in developed countries.

The objective of the present study was to analyze the prevalence and associated factors to cigarette smoking in a sample of individuals with severe mental illnesses in a large urban centre of a middle income country.

METHODS

A cross-sectional study was carried out in São Paulo, Southeastern Brazil. São Paulo is the largest urban center in South America, with a population of approximately 10 million inhabitants. Based on availability of all levels of mental care, seven administrative districts were chosen, heterogeneous in socioeconomic conditions, and totaling a population of 609,000 inhabitants. Public mental care services in these districts included

psychiatric hospitals, outpatient clinics, 24-hour psychiatric emergency services, day-hospitals and day centers, some of which in teaching hospitals. Most services were not organized on a catchment area basis.

The sampling frame was built to closely represent people suffering from severe mental illnesses living in the study area. For this, medical records of all mental health services (hospitals, emergency, outpatient clinics, day hospitals) providing public health care and most likely to be sought by people with severe mental illnesses living in those areas were screened. Selection criteria at this stage included: having had at least one contact with any of those services in the period from September 1st to November 30, 1997; be aged between 18 and 65 years; having a possible clinical diagnosis of functional psychosis; and be living in the study areas. A sample was then drawn from this list for direct interview. Subjects had then to meet ICD-10[21] criteria for diagnosis of non-affective psychosis (codes F20 to F29), bipolar disorder (F30 or F31), or depressive disorder with psychotic symptoms (F32.4 or F33.4). The sample size was calculated on basis of the precision of the prevalence estimate. For an expected prevalence of daily smoking of 75%, a sample of 201 subjects would yield a 95% confidence interval of 69% to 81%.

A standardized questionnaire was used to collect sociodemographic and socioeconomic data. Psychiatric history was obtained using the Life Chart Rating Form.[22] Psychiatric diagnoses were obtained using the ICD-10 checklist.[9] Psychopathology was assessed with the Positive and Negative Syndrome Scale (PANSS).[10] This scale comprises seven items for positive psychotic symptoms (such as delusions, hallucinations, thought disorder), seven items for negative psychotic symptoms (such as blunted affect, lack of insight, lack of abstract thinking), and 16 items for other psychiatric symptoms (such as anxiety, depression, worry). Each item is scored on a 7-point scale, ranging from one (no symptom) to seven (very severe symptom). Therefore, the higher the score in each subscale (positive, negative and general psychopathology), the more symptomatic the individual is. Patterns of substance use, including tobacco, in the 12 months prior to the interview, and symptoms of substance abuse or dependence in the same period of time were assessed using Sections 11 and 12 of the Schedule for Clinical Assessment in Neuropsychiatry (SCAN).[23] This instrument allows to classify use as "used any form of tobacco at least once in their lifetime," "used it on a regular basis," "regular use of tobacco in the previous 12 months" (i.e., use of any substance almost daily during the period), and "met criteria for nicotine dependence in the 12 months prior to the interview," according to the ICD-10. Subjects were interviewed at home, whenever possible.

The main outcome was daily use of cigarettes in the previous 12 months to the interview. Prevalence of daily cigarette smoking and related 95% confidence interval (95% CI) were estimated. Associations of cigarette smoking with subjects' characteristics were assessed using χ^2 tests for categorical exposure variables; χ^2 tests for linear trend for ordered exposure variables; and analysis of variance for continuous exposure variables. Prevalence ratios and related 95% CI were calculated. Logistic regression was performed to obtain estimates of independent associations of individual characteristics with daily cigarette smoking. Selection of variables to be tested in the logistic regression was based on p-values <0.25 in the bivariate analysis. Variables were kept in the final logistic regression model if they had a p-value ≤0.05 according to the likelihood ratio test.

The study was approved by the Research Ethics Committee of Faculdade de Medicina da Universidade de São Paulo. All subjects signed an informed consent form agreeing to participate in the study.

RESULTS

The list obtained in the services included 620 names, and 404 were drawn to be included in the study sample. Of these, 116 (28.7%) had moved to other addresses, which were either unknown or too far from São Paulo to be visited by the research team, or were unknown in the address provided or the address did not exist. Among losses, 59 (14.6%) were refusals, 8 (2.0%) had died, 6 (1.4%) had become homeless, 3 (0.7%) were in prison, and six names were replicated in the list. Finally, 206 (51.0%) subjects were interviewed. Compared to interviewed subjects, non-respondents comprised a slightly higher proportion of women (56.1% vs. 47.6%; p=0.09) and affective disorders (30.0% vs. 22.8%; p=0.15), and were slightly younger (38.2 years vs. 40.0 years; p=0.14), though these differences between groups were not statistically significant. Fourteen subjects were excluded from further analyses because they did not meet ICD-10 criteria for any psychotic condition according to the standardized assessment.

Of the remaining 192 subjects, 102 (53.1%) were men, 30 (15.6%) had not completed elementary school, 110 (57.3%) were single, and 91 (47.4%) were born in the city of São Paulo (Table 1). Their mean age was 41.5 years (SD=11.4 years). Monthly family income ranged from R$ 100.00 to R$ 10,000.00, with a median of R$ 950.00 (R$ 1.00=US$ 1.13). Seventy (36.5%) subjects did not have their own source of income, relying entirely on relatives and friends to live. The most common clinical diagnosis was schizophrenia (N=113; 58.9%), and 61 (31.8%) had either bipolar disorder or depression with psychotic symptoms. Forty (20.8%) subjects had had no previous psychiatric admission, and 49 (25.5%) had been admitted to

Table 1. Frequency of current regular use of tobacco and subjects' characteristics associated. City of São Paulo, Southeastern Brazil, 1997. N=192

Variable	N	Tobacco use (%)	RR	95% CI	p-value
Gender					0.001
Female	90	43 (47.8)	1	-	
Male	102	72 (70.6)	1.48	1.15;1.90	
Marital status					0.02
Married/with partner	44	23 (52.3)	1	-	
Single	110	63 (57.3)	1.10	0.79;1.52	
Separated/widowed	38	29 (76.3)	1.46	1.05;2.04	
Place of birth					0.055
São Paulo	91	48 (52.7)	1	-	
Other	101	67 (66.3)	1.26	0.99;1.60	
Education (years)					0.54
0–3	30	17 (56.7)	1	-	
4–8	96	61 (63.5)	1.12	0.79;1.59	
9–11	34	17 (50.0)	0.88	0.56;1.40	
12 or more	32	20 (62.5)	1.10	0.73;1.67	
Age group (years)					0.96
18–24	14	8 (57.1)	1	-	
25–34	40	25 (62.5)	1.09	0.65;1.83	
35–44	63	39 (61.9)	1.08	0.66;1.77	
45–54	42	25 (59.5)	1.04	0.62;1.75	
55–65	33	18 (54.5)	0.95	0.55;1.65	
Diagnosis					0.98
Schizophrenia	113	67 (59.3)	1	-	
Other non-affective psychosis	12	7 (58.3)	0.98	0.60;1.63	
Bipolar disorder	46	27 (58.7)	0.99	0.74;1.32	
Depression with psychotic symptoms	15	10 (66.7)	1.12	0.76;1.66	
Schizoaffective disorder	6	4 (66.7)	1.12	0.63;2.02	
Psychiatric admissions					0.04
None	40	24 (60.0)	1	-	
1–3	60	28 (46.7)	0.78	0.54;1.13	
4–9	43	27 (62.8)	1.05	0.74;1.47	
10 or more	49	36 (73.5)	1.22	0.90;1.66	
Anti-psychotic medication use*					0.03
Never	26	12 (46.2)	1	-	
Sometimes	19	16 (84.2)	1.82	1.15;2.89	
Most of the time	145	86 (59.3)	1.29	0.83;1.99	

* Two missing values

psychiatric hospitals ten or more times during their lifetime. In regard to PANSS scores, the mean of positive symptoms was 11.5 (SD=5.6), negative symptoms was 14.8 (SD=8.6), and general symptoms was 25.9 (SD=8.5) (Table 2).

One-hundred and forty nine (77.6%) subjects reported having used any form of tobacco at least once in their lifetime, and 115 (59.9%; 95% CI: 52.6%;66.9%) reported daily smoking in the previous 12 months. Average consumption was 21.9 (SD=13.5) cigarettes per day, with a more intense daily use of 30.1 (SD=19.3). Among current smokers, 32 (27.8%) were light smokers (one to ten cigarettes per day), 43 (37.4%) were moderate smokers (11 to 20 per day), and 40 (34.8%) heavy smokers (more than 21 per day). Ninety-one (47.4%)

Table 2. Mean Positive and Negative Syndrome Scale (PANSS) scores according to smoking and non-smoking status. City of São Paulo, Southeastern Brazil, 1997. N=192

PANNS sub-scale	Non-smokers mean (SD)	Smokers mean (SD)	p-value
Positive symptoms*	10.7 (4.4)	12.0 (6.1)	0.09
Negative symptoms**	14.8 (8.3)	14.8 (8.9)	0.98
General symptoms***	25.4 (7.8)	26.2 (9.0)	0.55
Total score***	50.9 (17.4)	52.7 (20.1)	0.53

* Three missing values
** Five missing values
*** Four missing values

subjects met criteria for nicotine dependence in the 12 months prior to the interview.

Men were more likely to be smokers ($p<0.05$), as well as those who were separated or widowed (Table 1). Number of psychiatric admissions and irregular use of anti-psychotic medication in the previous two years were also statistically associated with the outcome. The logistic regression analysis showed that male gender ($p<0.001$), marital status separated or widowed ($p=0.003$), irregular use of anti-psychotic drugs ($p=0.02$) and history of ten or more psychiatric admissions ($p=0.016$) were independently associated with higher odds of being a current smoker.

DISCUSSION

Selection bias was a concern in the present study. In most services, the quality of medical records was poor, and several files were not included in the sampling list due to missing information on age, address and clinical diagnosis. However, this was more likely to be random, not associated with smoking status, which would not bias the prevalence estimate. Though non-participation was high, it is unlikely that this has biased the prevalence estimate for daily cigarette smoking. Non-respondents comprised a slightly higher proportion of women, and no association between age or diagnosis and daily cigarette smoking was seen.

Information on cigarette smoking was obtained by directly interviewing subjects, and no other source of information, such as relatives or medical records, was used. This may have contributed to an underestimation of the prevalence of comorbidity. However, such information bias is commoner when investigating use of heavy drugs, such as cocaine and heroin, than for cannabis and nicotine.[12]

The study sample consisted of people with severe mental illnesses who seek care in public care services. It is estimated that about 45% of the population of São Paulo has some kind of private health insurance.* Nevertheless, at the time the present study, most insurance plans did not cover mental illnesses. Thus, most people covered by private health insurance plans would have sought psychiatric care in the public sector. The area chosen for the study is not representative of the entire population of the city of São Paulo, comprising areas with above average deprivation indicators. Both these aspects limit the generalizability of the study findings.

The comparison of the present study results with the literature is not straightforward, because there are different definitions for current cigarette smoking. Some studies use subjective definitions, such as "regular use," while others may simply not state how current cigarette smoking was defined. Bearing that in mind, the prevalence of cigarette smoking in the present sample was as high as that found in samples of severely mentally ill people in developed countries,[4,7,8,11,18,20] and higher than that found in two studies in developing countries.[3,19] The prevalence of cigarette smoking found in the present sample was much higher than that seen in the Brazilian general population. In a recent survey of the general Brazilian population in 15 capitals and the Federal District, the estimated prevalence of current cigarette smoking in São Paulo was 20% among people aged 15 and older.** Therefore, individuals with severe mental illnesses were three times more likely to be current smokers than the general population. Male subjects, those separated and with larger number of previous psychiatric admissions were more likely to be current smokers corroborating the study findings in developed and developing countries.[3,11,18] No other sociodemographic or clinical features of subjects was associated with cigarette smoking.

Results from different populations may help to understand determinants of prevalence across populations.[17] In developed countries, consistency between results from several studies, showing a strong association between severe mental illness and tobacco smoking, raised hypotheses about individual factors. These are mostly related to the disease and psychiatric treatment, which may explain individual variation in smoking.[6,24] The high prevalence of smoking found in the present study contrasts with the low prevalence of substance misuse in the same population.[14] In many societies in low and middle income countries, most individuals with severe mental illnesses live with and rely upon their families to survive.[13,19] This may decrease their exposure and

* Fundação Sistema Estadual de Análise de Dados. Pesquisa de Condições de Vida 2001 - Distribuição dos Indivíduos, segundo Condição de Posse de Convênio ou Plano de Saúde, Estado de São Paulo, RMSP e Interior, 1994 – 1998. [Dados não divulgados]
** Ministério da Saúde. Inquérito domiciliar sobre comportamentos de risco e morbidade referida de doenças e agravos não transmissíveis: Brasil, 15 capitais e Distrito Federal, 2002-2003. Rio de Janeiro; Instituto Nacional do Câncer; 2004.

access to alcohol and illicit drugs. However, it seems that, for social and cultural reasons, families in São Paulo accept that their ill relatives smoke tobacco, and even support this habit. In countries where smoking is prohibited by familial, cultural and religious practices, the prevalence is not much different than that in general population,[19] reinforcing this assumption. In Brazil, smoking is allowed in most psychiatric hospitals, and it is common the use of cigarettes to maintain patients calm and under control, given as a reward for "good behavior" in the ward. Indeed, the prevalence of cigarette smoking was higher among those individuals who had a story of ten or more psychiatric admissions.

While cancer mortality rates in individuals with severe mental illnesses are not consistently high, rates of cardiovascular and respiratory diseases are usually greater, often even twice as high as those found in age-matched control populations.[2,7,8] The perception that smokers with severe mental illnesses would not be suitable for smoking cessation interventions is misleading. Indeed, a substantial proportion of smokers with schizophrenia recognize that smoking is a problem, and a subset of them reports they want to quit.[16] Some studies have even reported promising results in helping individuals with schizophrenia quit smoking.[1,5,24]

In conclusion, tobacco smoking among people with severe mental illnesses is likely to be a major problem in many developing areas in the world, particularly in large urban centers. Consistent anti-tobacco policies need be implemented in mental care services, banning smoking within health care premises and promoting specific programs for helping quit smoking. Training of mental health providers should include raising awareness of the problem, developing skills to help those with severe mental illnesses to stop smoking, and educating families and caregivers about health risks associated with smoking. If not, those who already suffer from such disruptive and disabling conditions will continue to suffer the extra burden of smoking-related health problems.

REFERENCES

1. Addington J, el-Guebaly N, Campbell W, Hodgins DC, Addington D. Smoking cessation treatment for patients with schizophrenia. *Am J Psychiatry.* 1998;155(7):974-6.
2. Brown S, Inskip H, Barraclough B. Causes of the excess mortality of schizophrenia. *Br J Psychiatry*. 2000;177:212-7.
3. Campo-Arias A, Diaz-Martinez LA, Rueda-Jaimes GE, Rueda-Sanchez M, Farelo-Palacin D, Diaz FJ, et al. Smoking is associated with schizophrenia, but not with mood disorders, within a population with low smoking rates: a matched case-control study in Bucaramanga, Colombia. *Schizophr Res.* 2006;83(2-3):269-76.
4. Filik R, Sipos A, Kehoe PG, Burns T, Cooper SJ, Stevens H, et al. The cardiovascular and respiratory health of people with schizophrenia. *Acta Psychiatr Scand.* 2006;113(4):298-305.
5. George TP, Ziedonis DM, Feingold A, Pepper WT, Satterburg CA, Winkel J, et al. Nicotine transdermal patch and atypical antipsychotic medications for smoking cessation in schizophrenia. *Am J Psychiatry*. 2000;157(11):1835-42.
6. Goff DC, Henderson DC, Amico E. Cigarette smoking in schizophrenia: relationship to psychopathology and medication side effects. *Am J Psychiatry*. 1992;149(9):1189-94.
7. Goff DC, Sullivan LM, McEvoy JP, Meyer JM, Nasrallah HA, Daumit GL, et al. A comparison of ten-year cardiac risk estimates in schizophrenia patients from the CATIE study and matched controls. *Schizophr Res.* 2005;80(1):45-53.
8. Hennekens CH, Hennekens AR, Hollar D, Casey DE. Schizophrenia and increased risks of cardiovascular disease. *Am Heart J*. 2005;150(6):1115-21.
9. Janca A, Drimmelen JV, Dittmann V, Isaac M, Ustun, TB.ICD-10 symptom checklist for mental disorders. Version 1.1. Geneva: World Health Organization; 1994.
10. Kay SR, Opler LA, Lindenmayer JP. Reliability and validity of the Positive and Negative Syndrome Scale for schizophrenics. *Psychiatry Res.* 1988;23(1):99-110.
11. Kilian R, Becker T, Krüger K, Schmid S, Frasch K. Health behavior in psychiatric in-patients compared with a German general population sample. *Acta Psychiatr Scand.* 2006;114(4):242-8.
12. McPhillips MA, Kelly FJ, Barnes TRE, Duke PJ, Gene-Cos N, Clark K. Detecting comorbid substance misuse among people with schizophrenia in the community: a study comparing the results of questionnaires with analysis of hair and urine. *Schizophr Res.* 1997;25(2):141-8.
13. Menezes PR, Mann AH. The social adjustment of patients with schizophrenia: implications to the mental health policy in Brazil. *Rev Saude Publica.* 1993;27(5):340-9.
14. Rossi Menezes P, Ratto LR. Prevalence of substance misuse among individuals with severe mental illness in São Paulo. *Soc Psychiatry Psychiatr Epidemiol.* 2004;39(3):212-7.
15. Nilsson A, Waller L, Rosengren A, Adlerberth A, Wilhelmsen L. Cigarette smoking is associated with abnormal involuntary movements in the general male population-a study of men born in 1933. *Biol Psychiatry.* 1997;41(6):717-23.
16. Osborn DPJ, King MB, Nazareth I. Participation in screening for cardiovascular risk by people with schizophrenia or similar mental illness: cross sectional study in general practice. *BMJ.* 2003; 326(7399):1122-3.
17. Rose G. Sick individuals and sick populations. *Int J Epidemiol.* 2001;30(3)427-32.
18. Salokangas RKR, Honkonen T, Stengård E, Koivisto AM, Hietala J. Cigarette smoking in long-term schizophrenia. *Eur Psychiatry.* 2006;21(4):219-23.
19. Srinivasan TN, Thara R. Smoking in schizophrenia - all is not biological. *Schizophr Res.* 2002; 56(1-2):67-74.
20. Strassnig M, Brar JS, Ganguli R. Increased caffeine and nicotine consumption in community-dwelling patients with schizophrenia. *Schizophr Res.* 2006;86(1-3):269-75.
21. World Health Organization. The ICD-10 Classification of Mental and Behavioral Disorders. Clinical descriptions and diagnostic guidelines. Geneva; 1992.
22. World Health Organization. Life Chart Rating Form. Geneva; 1992.
23. World Health Organization. Schedule for clinical assessment in Neuropsychiatry. Geneva; 1994.
24. Ziedonis DM, George TP. Schizophrenia and nicotine use: report of a pilot smoking cessation program and review of neurobiological and clinical issues. *Schizophr Bull.* 1997;23(2):247-54.

Supported by Fundação de Amparo à Pesquisa do Estado de São Paulo (Fapesp – Proc. n.º 96/10077-3).