

ORIGINAL PAPER

Matthew M. Large · Olav Nielssen · Christopher James Ryan · Robert Hayes

Mental health laws that require dangerousness for involuntary admission may delay the initial treatment of schizophrenia

Received: 16 August 2007 / Accepted: 31 October 2007 / Published online: 30 November 2007

Abstract *Introduction* A long duration of untreated psychosis (DUP) is associated with a worse prognosis, an increased risk of suicide and may be linked to serious violence. Mental health laws that require patients to be dangerous to themselves or to others before they can receive involuntary psychiatric treatment may make it more difficult to treat patients in their first episode of psychosis. *Methods* The mean and median DUP reported in studies of schizophrenia related psychoses were examined. A comparison was made between the DUP reported from jurisdictions that had an obligatory dangerousness criterion (ODC) and those with other criteria for involuntary treatment. *Results* The average mean DUP in samples from jurisdictions with an ODC was 79.5 weeks, but was only 55.6 weeks in those jurisdictions that did not

have an ODC ($P < 0.007$). *Conclusions* Mental health laws that require the patient to be assessed as dangerous before they can receive involuntary treatment are associated with significantly longer DUP. As reducing DUP is an intervention that can improve the prognosis of schizophrenia, this finding suggests that mental health laws should be amended to allow treatment on grounds other than dangerousness, at least in the crucial first episode of psychosis.

Key words schizophrenia – duration of untreated psychosis – mental health services

Dr. M.M. Large, BSc(Med), MBBS, FRANZCP
Dr. O. Nielssen, MB, BS, MCrim, FRANZCP
Private Practice
326 South Dowling Street
Paddington (NSW), 2025 Australia

Dr. M.M. Large, BSc(Med), MBBS, FRANZCP (✉)
PO Box 110
Double Bay (NSW), 1360 Australia
E-Mail: mmb1@bigpond.com

Dr. O. Nielssen, MB, BS, MCrim, FRANZCP
Clinical Research Unit for Anxiety Disorders
School of Psychiatry
UNSW at St Vincent's Hospital
Darlinghurst, Sydney (NSW), Australia

Dr. O. Nielssen, MB, BS, MCrim, FRANZCP
Dr. C.J. Ryan, MBBS, FRANZCP
Psychological Medicine
University of Sydney
Sydney (NSW), Australia

Dr. C.J. Ryan, MBBS, FRANZCP
Westmead Hospital
Westmead (NSW), Australia

R. Hayes, LLB, PhD
Mental Health Research and Training Centre (MHRTC),
Law School
University of Western Sydney
Campbelltown (NSW), Australia

Introduction

The duration of untreated psychosis (DUP) is usually defined as the period between the emergence of psychosis and the initiation of adequate treatment with antipsychotic medication [50]. Longer DUP has been associated with a worse overall prognosis [43, 53] an increased risk of suicide [3, 14, 46], serious violence [47, 67] and homicide [36]. A public health approach to encourage earlier treatment may reduce DUP [38].

Since the mid 1970s the mental health laws in many jurisdictions have been amended to limit involuntary admission to those who have been assessed as dangerous to themselves or to others. This requirement is known as an obligatory dangerousness criterion (ODC). An ODC is a feature of the mental health acts of all states of the USA and Australia, five Canadian provinces and six European countries. The mental health acts of the remaining Canadian provinces and European nations (including the UK) include alternative criteria for involuntary treatment, so that dangerousness is not obligatory. Jurisdictions that do not have an *obligatory* dangerousness criterion usually allow involuntary treatment on the grounds of an assessed need for treatment if the patient is deemed unable to give consent.

It has been argued that the introduction of the ODC caused only a temporary change in patterns of involuntary treatment as clinicians and those who enforced the legislation soon worked around any legal changes in order to provide necessary care [5]. However, the treatment of patients in their first episode of psychosis (FEP) may be more likely to have been affected by the introduction of an ODC than patients with established illness. The assessment of risk of harm that is required in legislation with an ODC relies heavily on a history of previous episodes of violence or self-harm. Patients in their first episode of illness are less likely to have a history of dangerous behaviour arising from mental illness than patients with established illness. As a consequence it may be more difficult for clinicians to argue that first episode patients are dangerous. Although there are a number of studies that compared the characteristics of populations of hospitalised patients before and after changes in mental health law [4] none specifically examine the effect on patients in the FEP and these studies could not have detected the effect on FEP patients as they make up a small proportion of all patients because of the chronic nature of schizophrenia.

The hypothesis of this study was that FEP patients living in jurisdictions that have an ODC rather than alternative criteria for involuntary treatment would take longer to receive treatment and hence have a longer DUP.

In order to test this hypothesis, we compared the average mean and average median DUP of studies conducted in jurisdictions that had an ODC with those of studies conducted in jurisdictions that had alternative criteria for involuntary treatment. Our independent variables were patient age, sex, diagnosis and whether the study was reported from a specialist first episode psychosis service. In an attempt to take into account the effect of the overall standard of health care, we also considered the number of psychiatrists and psychiatric hospital beds per capita, and the way mental health care was funded.

Methods

The electronic databases [Medline], [Embase], [Psychlit] and [Pubmed] were searched for peer reviewed studies conducted between 1976 and 2006 and published in English, using the following search strategies and terms: “duration of untreated psychosis” or “first-episode psychosis” and “onset” and “schizophrenia”. The references of relevant articles were hand searched for other studies. We included studies that reported the mean or median DUP and studies from which we could calculate the mean DUP by subtracting the mean age of onset of psychotic symptoms from the mean age of initial treatment if both were reported to one decimal point.

We included samples of the DUP of schizophrenia spectrum psychosis collected after 1976 from developed western countries. We excluded studies from developing countries and from Asian countries, as these countries generally report long periods of DUP and may not have comparable mental health law. Data was

extracted independently by ML and ON and several disagreements due to the conversion of time units were unambiguously resolved.

We determined the relevant jurisdiction for each sample and then ascertained which jurisdictions had an ODC for involuntary treatment [4, 5, 20, 26, 28]. Studies that sampled patients from more than one jurisdiction were excluded from the analysis if the jurisdictions differed in their use of an ODC.

We recorded the mean age and proportion of male and schizophrenic patients from each sample. We also recorded whether the studies were conducted by specialist early psychosis services. We then used data available from the 2005 WHO Project Atlas of the Department of Mental Health and Substance Abuse [70] to determine the number of psychiatrists per 100,000 people, the number of psychiatric beds per 10,000 people and whether or not mental health treatment is paid for by government funded universal health schemes in each country.

The mean DUP values were not normally distributed (skewness 1.0, $P < 0.003$) and were therefore Log_{10} transformed. We used an unpaired, two tailed t test for two group comparisons of continuous data and a chi-square test for categorical data. Stepwise linear regression weighted for sample size was used in a multivariate analysis. The statistical analysis was performed using version 15.0 of SPSS.

Results

We examined 301 papers and located 98 publications with non-overlapping samples of the DUP. Of these, eight studies from developing countries, twelve studies from Asian countries, five multinational studies that included subjects from both ODC and non-ODC countries and 24 studies that reported samples with varying proportions of patients with bipolar disorder and psychotic depression were excluded. Two studies of treatment delay were excluded because they only reported the proportion of treated patients at fixed time intervals. Data collection in the earliest study started in 1978. There were a total of 64 non-overlapping samples from 47 published studies that met the inclusion criteria, that were from Australia [32], Canada [1, 6, 8, 10, 15], Denmark [42, 45, 54], Finland [35, 58], Germany [24, 29, 56], Ireland [13], Italy [2, 3, 44, 49], The Netherlands [39, 71], Norway [23, 37, 45, 46, 48], Spain [18, 35, 52], Sweden [11], the United Kingdom [7, 9, 19, 21, 30, 57, 59, 61, 65] and the USA [12, 16, 17, 25, 27, 33, 40, 41, 55, 62, 63]. The samples had an average of 88 subjects (SD 79) and described the DUP of a total of 5,849 subjects.

The average mean DUP of all the subjects was 65.6 weeks (SD 38.4). There was evidence of significant positive skew in many of the samples, as the average mean DUP was much longer than the average median DUP of 22.9 weeks (SD 15.5). The presence of some patients with very long DUP was also evident in the studies that reported the range, and by the standard deviation exceeding the mean in almost all the samples.

The average mean DUP in samples from jurisdictions with an ODC was 43% longer (ODC; 79.5 weeks, 95% CI 63.5–95.4 weeks, median 71 weeks) than those jurisdictions that did not have an ODC (No-ODC; 55.6 weeks, 95% CI 43.4–68.8 weeks, median

Table 1 Mean DUP and Median DUP in jurisdictions that differ in their use of a danger criterion

Characteristics Regions sampled	Obligatory danger-criterion samples USA, Australia, France, Germany, The Netherlands, Ontario, Quebec	No obligatory danger-criterion samples Denmark, Finland, Ireland, UK, Norway, Italy, Spain, British Columbia, Nova Scotia	<i>P</i>	
Number of samples available to calculate mean	25	35		
Number of samples available to calculate median	13	19		
Weighted mean DUP	77.7	55.7		
Average mean DUP weeks (SD/median)	79.5 (38.6/71)	55.6 (35.6/49)	<i>t</i> = 2.82	0.007
Average median DUP weeks (SD/median)	27.5 (16.3/28.0)	19.9 (14.5/16.0)	<i>t</i> = 1.37	0.17
Mean age at initial treatment years (SD)	24.3 (3.8)	26.8 (2.6)	<i>t</i> = 3.10	0.003
Percentage male (SD)	60.3 (22.9)	61.6 (18.5)	<i>t</i> = 0.24	0.80
Mean % of patients with schizophrenia (SD)	89.0 (15.4)	80.3 (28.6)	<i>t</i> = 1.67	0.10
Specialized early psychosis service	7	9	$\chi^2 = 0.04$	0.84
Government funded health scheme	7	31	$\chi^2 = 20.5$	0.0001
Psychiatrists per 100,000 population	10.34 (1.75)	11.1 (4.21)	<i>t</i> = 0.85	0.39
Psychiatric beds per 10,000 population	13.7 (4.6)	11.0 (5.4)	<i>t</i> = -2.01	0.049

49 weeks). The weighted mean DUP for the subjects in the ODC group was 77.7 weeks and was 55.7 weeks in the non-ODC group, an average difference of more than 5 months (Table 1, Fig. 1).

The average median DUP was 38% longer in the ODC samples (ODC; 27.5 weeks, 95% CI 17.3–37.3 weeks, median 28 weeks) than the non-ODC samples (No-ODC; 19.9 weeks, 95% CI 12.9–26.9 weeks, median 16 weeks) a result that was not significant. The lack of significance may have been due to the smaller number of samples for which a figure for median DUP was reported.

Samples from ODC jurisdictions also reported a significantly lower mean age of initial treatment and a non-significantly larger number of patients diagnosed

with schizophrenia. Jurisdictions with an ODC were less likely to have universal mental health care funded by taxation and had a slightly higher number of psychiatric hospital beds. However, a stepwise least squares regression, weighted for sample size found that the ODC was the only significant factor associated with Log_{10} mean DUP after one step (Table 2).

Discussion

The mean DUP for all of the studies was over a year. However, in those jurisdictions with an ODC, the mean DUP was on average about 5-months longer. The longer mean DUP in regions with an ODC may have been partly due to differences in the distributions of DUP samples, as the longer mean DUP may have been due to a minority of patients with very long DUP who were not initially considered to be dangerous, but who received treatment at a later date.

In addition to the association with a long DUP, the presence of an ODC was associated with a slightly lower mean age at presentation. The most likely explanation for this is that it reflects the different demographics of some of the countries with an ODC. For example the USA and Australia have a larger proportion of young people than the UK and many other European countries that do not have an ODC in their mental health law [66]. Furthermore, several of the studies conducted in the jurisdictions with an ODC were providing specific services for younger people [32, 39, 56] and had a lower mean age. However, this result might also be due to younger patients receiving treatment earlier because they are more aggressive while some older patients may have missed out on treatment in ODC regions because they were not assessed as dangerous. If younger more dangerous patients are treated earlier in ODC jurisdictions an ecological fallacy could arise in which the mean age of treatment is lower, but the very delayed treatment in a proportion of patients significantly prolongs the mean DUP of the whole group.

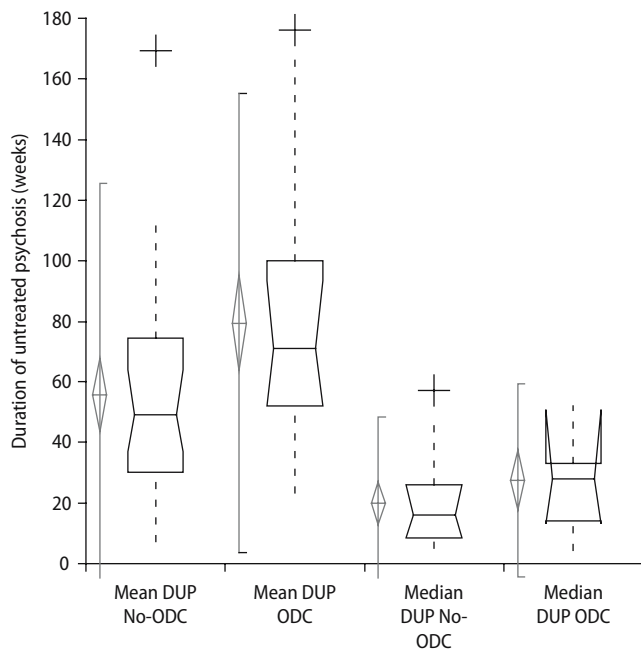


Fig. 1 The distribution of mean and median DUP values from studies in regions with an ODC and with No-ODC. Line and diamond two standard deviations and 95% CI. Box median, 25th and 75th percentile values. Cross most extreme outlier

Table 2 The associations between ODC, covariates and Log₁₀ Mean DUP*

	Included variables					
	B	SE	Beta	t	P	
Presence of ODC	0.200	0.068	0.362	2.958	0.004	
Constant	1.653	0.047		35.00	0.000	
Variables excluded after one step						
	Beta	In	t	Sig	Partial correlation	Collinearity (tolerance)
Proportion of patients with schizophrenia	0.077		0.614	0.542	0.081	0.959
Mean age at first treatment	0.039		0.293	0.770	0.039	0.871
Percentage male	-0.112		-0.908	0.368	-0.119	0.985
Specialized early psychosis service	-0.109		-0.886	0.379	-0.117	0.997
Tax based mental health funding	-0.043		-0.276	0.783	0.037	0.622
Psychiatrists per 100,000 population	0.086		-0.700	0.487	0.092	0.996
Psychiatric beds per 10,000 population	-0.218		-1.701	0.094	-0.220	0.886

*Stepwise least squares regression weighted for sample size

Several limitations of the study should be acknowledged. First we were unable to estimate the proportion of first episode patients whose treatment was delayed as a result of the presence of an ODC, partly because the median DUP was reported in fewer samples than the mean. If the median DUP had been reported in more of the studies it may have been possible to assess if an ODC prolongs the DUP of the majority of patients, rather than increasing the number of subjects with very long DUP.

It is possible that the ODC prolongs the DUP of a significant proportion of patients. As many as 80% of FEP patients require inpatient treatment early in their illness [60, 69], and half of those are admitted within one week of contact with services [60]. In many cases admission has to be involuntary as few patients recognise that their symptoms are due to an illness [22, 64]. A significant proportion of these patients might be considered to be dangerous during their FEP. About a third of first episode patients have some suicidal ideas [51] and as many as 20% of patients may make an actual suicide attempt [3]. Aggressive behaviour is also common. About 20% of first presentation patients threaten serious violence [34], and about 10% commit a serious act of aggression [47] or an actual assault [68]. These patients and those with actual or threatened self-harm would be legally regarded as dangerous and could receive treatment under mental health law with an ODC. However, it is not known how many patients are not initially dangerous but later become so, and what proportion of patients are not dangerous and initially refuse treatment but accept treatment later in their illness.

A second limitation of the study is that we did not consider the DUP of two groups of patients with psychosis. Studies that included patients with affective psychosis were not included so that we could compare samples with similar patients and only a few

of the studies recorded the DUP of those who were unwilling to participate in research. Furthermore, areas in which FEP research is conducted may have better services and hence a shorter DUP than other areas in the same jurisdictions.

A third limitation stems from the fact that ODC were mostly introduced before studies of DUP were conducted or published, which precluded a direct examination of the effect of the changes in legislation on DUP in any jurisdiction.

Finally it is also possible that the association between the presence of an ODC and long DUP is not causal. DUP is thought to be associated with a range of illness, patient, family and cultural factors. Some of these factors, although they may be difficult to quantify on a population basis, might by coincidence prolong DUP in the regions with an OCD. However, it is likely that at least some of the increase in DUP in regions with an OCD is a direct result of differences in mental health law, as we found no independent association between longer DUP and a range of patient and health service factors. In addition the finding is consistent with an a priori hypothesis that was formed on the basis of both a plausible mechanism and clinical observations made in a jurisdiction with an ODC.

The widespread adoption of the ODC in mental health laws arose from the desire to balance the rights of the mentally ill with the need to protect the public [31]. In reality, the introduction of the ODC may have had the unwanted and harmful effect of delaying the initial treatment of patients with psychosis.

References

1. Addington J, Van Mastrigt S, Addington D (2004) Duration of untreated psychosis: impact on 2-year outcome. *Psychol Med* 34:277-284

2. Altamura AC, Bassetti R, Sassella F, Salvadori D, Mundo E (2001) Duration of untreated psychosis as a predictor of outcome in first-episode schizophrenia: a retrospective study. *Schizophr Res* 52:29–36
3. Altamura AC, Bassetti R, Bignotti S, Pioli R, Mundo E (2003) Clinical variables related to suicide attempts in schizophrenic patients: a retrospective study. *Schizophr Res* 60:47–55
4. Anfang SA, Appelbaum PS (2006) Civil commitment—the American experience. *Isr J Psychiatry Relat Sci* 43:209–218
5. Appelbaum PS (1997) Almost a revolution: an international perspective on the law of involuntary commitment. *J Am Acad Psychiatry Law* 25:135–147
6. Ballageer T, Malla A, Manchanda R, Takhar J, Haricharan R (2005) Is adolescent-onset first-episode psychosis different from adult onset? *J Am Acad Child Adolesc Psychiatry* 44:782–789
7. Barnes TR, Hutton SB, Chapman MJ, Mutsatsa S, Puri BK, Joyce EM (2000) West London first-episode study of schizophrenia. Clinical correlates of duration of untreated psychosis. *Br J Psychiatry* 177:207–211
8. Beiser M, Erickson D, Fleming JA, Iacono WG (1993) Establishing the onset of psychotic illness. *Am J Psychiatry* 150:1349–1354
9. Birchwood M, Cochrane R, Macmillan F, Copestake S, Kucharska J, Carriss M (1992) The influence of ethnicity and family structure on relapse in first-episode schizophrenia. A comparison of Asian, Afro-Caribbean, and white patients. *Br J Psychiatry* 161:783–790
10. Black K, Peters L, Rui Q, Milliken H, Whitehorn D, Kopala LC (2001) Duration of untreated psychosis predicts treatment outcome in an early psychosis program. *Schizophr Res* 47:215–222
11. Carlsson R, Nyman H, Ganse G, Cullberg J (2006) Neuropsychological functions predict 1- and 3-year outcome in first-episode psychosis. *Acta Psychiatr Scand* 113:102–111
12. Caton CL, Hasin DS, Shrout PE et al (2006) Predictors of psychosis remission in psychotic disorders that co-occur with substance use. *Schizophr Bull* 32:618–625
13. Clarke M, Whitty P, Browne S et al (2006) Untreated illness and outcome of psychosis. *Br J Psychiatry* 189:235–240
14. Clarke M, Whitty P, Browne S et al (2006) Suicidality in first episode psychosis. *Schizophr Res* 86:221–225
15. Cohen RZ, Gotowiec A, Seeman MV (2000) Duration of pre-treatment phases in schizophrenia: women and men. *Can J Psychiatry* 45:544–547
16. Compton MT, Esterberg MI, Druss Bg, Walker Ef, Kaslow NJ (2006) A descriptive study of pathways to care among hospitalized urban African American first-episode schizophrenia-spectrum patients. *Soc Psychiatry Psychiatr Epidemiol* 41:566–573
17. Craig TJ, Bromet EJ, Fennig S, Tanenberg-Karant M, Lavelle J, Galambos N (2000) Is there an association between duration of untreated psychosis and 24-month clinical outcome in a first-admission series? *Am J Psychiatry* 157:60–66
18. Crespo-Facorro B, Pelayo-Teran JM, Perez-Iglesias R et al (2007) Predictors of acute treatment response in patients with a first episode of non-affective psychosis: sociodemographics, premorbid and clinical variables. *J Psychiatr Res* 41:659–666
19. Drake RJ, Haley CJ, Akhtar S, Lewis SW (2000) Causes and consequences of duration of untreated psychosis in schizophrenia. *Br J Psychol* 177:511–515
20. Dressing H, Salize HJ (2004) Compulsory admission of mentally ill patients in European Union Member States. *Soc Psychiatry Psychiatr Epidemiol* 39:797–803
21. Fannon D, Chitnis X, Doku V et al (2000) Features of structural brain abnormality detected in first-episode psychosis. *Am J Psychol* 157:1829–1834
22. Fennig S, Everett E, Bromet EJ et al (1996) Insight in first-admission psychotic patients. *Schizophr Res* 22:257–263
23. Friis S, Melle I, Larsen TK et al (2004) Does duration of untreated psychosis bias study samples of first-episode psychosis? *Acta Psychiatr Scand* 110:286–289
24. Fuchs J, Steinert T (2004) Patients with a first episode of schizophrenia spectrum psychosis and their pathways to psychiatric hospital care in South Germany. *Soc Psychiatry Psychiatr Epidemiol* 39:375–380
25. Gunduz-Bruce H, McMeniman M, Robinson DG et al (2005) Duration of untreated psychosis and time to treatment response for delusions and hallucinations. *Am J Psychiatry* 162:1966–1969
26. Gray JE, O'Reilly RL (2001) Clinically significant differences among Canadian mental health acts. *Can J Psychiatry* 46:315–321
27. Haas GL, Sweeney JA (1992) Premorbid and onset features of first-episode schizophrenia. *Schizophr Bull* 18:373–386
28. Hatling T, Krogen T, Ulleberg P (2002) Compulsory admissions to psychiatric hospitals in Norway—international comparisons and regional variations. *J Mental Health* 11:623–634
29. Hafner H, Maurer K, Löffler W, Riecher-Rössler A (1993) The influence of age and sex on the onset and early course of schizophrenia. *Br J Psychiatry* 162:80–86
30. Haley CJ, Drake RJ, Bentall RP, Lewis SW (2003) Health beliefs link to duration of untreated psychosis and attitudes to later treatment in early psychosis. *Soc Psychiatry Psychiatr Epidemiol* 38:311–316
31. Harding TW, Curran WJ (1979) Mental health legislation and its relationship to program development: an international review. *Harvard J Legis* 16:19–57
32. Harris A, Brennan J, Anderson J et al (2005) Clinical profiles, scope and general findings of the Western Sydney first episode Psychosis Project. *Aust N Z J Psychiatry* 39:36–43
33. Ho Bc, Alicata D, Ward J et al (2003) Untreated initial psychosis: relation to cognitive deficits and brain morphology in first-episode schizophrenia. *Am J Psychiatry* 160:142–148
34. Humphreys MS, Johnstone EC, Macmillan JF, Taylor PJ (1992) Dangerous behaviour preceding first admissions for schizophrenia. *Br J Psychiatry* 161:501–505
35. Kalla O, Aaltonen J, Wahlström J, Lehtinen V, García Cabeza I, González DE Chávez M (2002) Duration of untreated psychosis and its correlates in first-episode psychosis in Finland and Spain. *Acta Psychiatr Scand* 106:265–275
36. Large M, Nielsen O (2007) Evidence for a relationship between the duration of untreated psychosis and the proportion of psychotic homicides prior to treatment. *Soc Psychiatry Psychiatr Epidemiol*. (in press)
37. Larsen TK, McGlashan TH, Johannessen JO et al (2001) Shortened duration of untreated first episode of psychosis: changes in patient characteristics at treatment. *Am J Psychiatry* 158:1917–1919
38. Lieberman JA, Fenton WS (2000) Delayed detection of psychosis: causes, consequences, and effect on public health. *Am J Psychiatry* 157:1727–1730
39. Linszen D, Dingemans P, Lenior M (2001) Early intervention and a five year follow up in young adults with a short duration of untreated psychosis: ethical implications. *Schizophr Res* 51:55–56
40. Loebel AD, Lieberman JA, Alvir JM, Mayerhoff DI, Geisler SH, Szymanski SR (1992) Duration of psychosis and outcome in first-episode schizophrenia. *Am J Psychiatry* 149:1183–1188
41. Loranger AW (1984) Sex difference in age at onset of schizophrenia. *Arch Gen Psychiatry* 41:157–161
42. Madsen AL, Karle A, Rubin P, Cortsen M, Andersen HS, Hemmingsen R (1999) Progressive atrophy of the frontal lobes in first-episode schizophrenia: interaction with clinical course and neuroleptic treatment. *Acta Psychiatr Scand* 100:367–374
43. Marshall M, Lewis S, Lockwood A, Drake R, Jones P, Croudace T (2005) Association between duration of untreated psychosis and outcome in cohorts of first-episode patients: a systematic review. *Arch Gen Psychiatry* 62:975–983
44. Mauri M, Volonteri L, De Gaspari I, Colasanti A, Brambilla M, Cerruti L (2006) Substance abuse in first-episode schizophrenic patients: a retrospective study. *Clin Pract Epidemiol Ment Health* 2:4

45. Melle I, Haahr U, Friis S et al (2005) Reducing the duration of untreated first-episode psychosis—effects on baseline social functioning and quality of life. *Acta Psychiatr Scand* 112:469–473
46. Melle I, Johannesen JO, Friis S (2006) Early detection of the first episode of schizophrenia and suicidal behavior. *Am J Psychiatry* 163:800–804
47. Milton J, Amin S, Singh SP et al (2001) Aggressive incidents in first-episode psychosis. *Br J Psychiatry* 178:433–440
48. Moller P (2000) First-episode schizophrenia: do grandiosity, disorganization, and acute initial development reduce duration of untreated psychosis? An exploratory naturalistic case study. *Compr Psychiatry* 41:184–190
49. Moscarelli M, Capri S, Neri L (1991) Cost evaluation of chronic schizophrenic patients during the first 3 years after the first contact. *Schizophr Bull* 17:421–426
50. Norman RM, Malla AK (2001) Duration of untreated psychosis: a critical examination of the concept and its importance. *Psychol Med* 31:381–400
51. Nordentoft M, Jeppesen P, Abel M et al (2002) OPUS study: suicidal behaviour, suicidal ideation and hopelessness among patients with first-episode psychosis. One-year follow-up of a randomised controlled trial. *Br J Psychiatry* 181:s98–106
52. Peralta V, Cuesta MJ, Martinez-Larrea A, Serrano JF, Langarica M (2005) Duration of untreated psychotic illness: the role of premorbid social support networks. *Soc Psychiatry Psychiatr Epidemiol* 40:345–349
53. Perkins DO, Gu H, Boteva K, Lieberman JA (2005) Relationship between duration of untreated psychosis and outcome in first-episode schizophrenia: a critical review and meta-analysis. *Am J Psychiatry* 162:1785–1804
54. Petersen L, Nordentoft M, Jeppesen P et al (2005) Improving 1-year outcome in first-episode psychosis: OPUS trial. *Br J Psychiatry Suppl* 48:s98–s103
55. Reilly JL, Harris MS, Keshavan MS, Sweeney JA (2006) Adverse effects of risperidone on spatial working memory in first-episode schizophrenia. *Arch Gen Psychiatry* 63:1189–1197
56. Ropcke B, Eggers C (2005) Early-onset schizophrenia: a 15-year follow-up. *Eur Child Adolesc Psychiatry* 14:341–350
57. Rosen K, Garety P (2005) Predicting recovery from schizophrenia: a retrospective comparison of characteristics at onset of people with single and multiple episodes. *Schizophr Bull* 31:735–750
58. Seikkula J, Aaltonen J, Alakare B, Haarakangas K, Keränen J, Lehtinen K (2006) Five-year experience of first-episode non affective psychosis in open-dialogue approach: Treatment principles, follow-up outcomes, and two case studies. *Psychother Res* 16:214–228
59. Singh SP, Cooper JE, Fisher HL et al (2005) Determining the chronology and components of psychosis onset: the Nottingham onset schedule (NOS). *Schizophr Res* 80:117–130
60. Sipos A, Harrison G, Gunnell D, Amin S, Singh SP (2001) Patterns and predictors of hospitalisation in first-episode psychosis. Prospective cohort study. *Br J Psychiatry* 178:518–523
61. Skeate A, Jackson C, Birchwood M, Jones C (2002) Duration of untreated psychosis and pathways to care in first-episode psychosis. Investigation of help-seeking behaviour in primary care. *Br J Psychiatry* 181:s73–s77
62. Strakowski SM, Keck PE Jr, Mcelroy SL, Lonczak HS, West SA (1995) Chronology of comorbid and principal syndromes in first-episode psychosis. *Compr Psychiatry* 36:106–112
63. Szymanski SR, Cannon TD, Gallacher F, Erwin RJ, Gur RE (1996) Course of treatment response in first-episode and chronic schizophrenia. *Am J Psychiatry* 153:519–525
64. Thompson KN, McGorry PD, Harrigan SM (2001) Reduced awareness of illness in first-episode psychosis. *Compr Psychiatry* 42:498–503
65. Turner MA, Finch PJ, McKechnie AG et al (2006) Psychosis in the British army: a 2-year follow-up study. *Mil Med* 171:1215–1219
66. United Nations national populations profiles (2005) Accessed (http://unstats.un.org/unsd/cdb/cdb_country_prof_select.asp 10 August 2007)
67. Verma S, Poon LY, Subramaniam M, Chong SA (2005) Aggression in Asian patients with first-episode psychosis. *Int J Soc Psychiatry* 51:365–371
68. Volavka J, Laska E, Baker S, Meisner M, Czobor P, Krivelevich I (1997) History of violent behaviour and schizophrenia in different cultures. Analyses based on the WHO study on determinants of outcome of severe mental disorders. *Br J Psychiatry* 171:9–14
69. Wade D, Harrigan S, Harris MG, Edwards J, McGorry PD (2006) Pattern and correlates of inpatient admission during the initial acute phase of first-episode psychosis. *Aust N Z J Psychiatry* 40:429–436
70. WHO project atlas of the department of mental health and substance abuse available for 2005 (accessed http://www.who.int/mental_health/evidence/atlas/en/ 10 June 2001)
71. Wunderink A, Nienhuis FJ, Sytema S, Wiersma D (2006) Treatment delay and response rate in first episode psychosis. *Acta Psychiatr Scand* 113:332–339