Prevalence and clinical characteristics of obsessive-compulsive disorder and obsessive compulsive symptoms in Afrikaner schizophrenia and schizoaffective disorder patients

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Abstract
Objective: There is evidence of variation in the prevalence of co-morbid obsessive-compulsive disorder in schizophrenia amongst ethnic groups. This study evaluated the lifetime prevalence and clinical characteristics of obsessive-compulsive disorder (OCD)/ obsessive-compulsive symptoms (OCS) in Afrikaner schizophrenic and schizoaffective disorder patients. **Method:** An ongoing genetic study of schizophrenia is currently being conducted on the Afrikaner founder population. In this cohort of 400 subjects from the original genetic study, we identified 53 subjects with schizophrenia or schizoaffective disorder and co-morbid OCD/OCS (study group). They were matched for gender and age of onset of illness with 59 subjects who do not have OCD/OCS (control group). The diagnostic instrument used in this cohort is the Diagnostic Interview for Genetic Studies (DIGS) version 2, which has been translated into Afrikaans. In addition to the DIGS, information for the relevant clinical characteristics reported in this study was also drawn from a detailed narrative chronological summary report and clinical files. A checklist was completed. **Results:** The prevalence of co-morbid OCD/OCS amongst 400 subjects with schizophrenia or schizoaffective disorder was 13.2% [n=53] of which 40 were male and 13 female patients. The prevalence of OCD was 10.7% and OCS was 2.5%. Contamination obsessions [n=17] were the most common type of obsession reported, followed by religious obsessions [n=8]. The most prevalent compulsions were repetitive rituals [n=32] followed by checking behaviour [n=22]. Onset of psychotic symptoms was found to be insidious in 86.8% of the study group compared to 24.6% of the control group ($p<0.0001$). Second-generation antipsychotic use was found to be statistically more prevalent in the study group (77.4%), compared to the control group (45.8%) ($p=0.0008$). 73% of the study group experienced depressive symptoms compared to 50.8% of the control group. Both groups were found to have a similar incidence of suicidal thoughts and suicide attempts. Substance abuse amongst the control group was significantly higher (35.9%) compared to the study group (19.2%) ($p <0.05$). Cannabis was most commonly abused in both groups, followed by alcohol. **Conclusion:** The prevalence rate of 13.2% of co-morbid OCD/OCS in Afrikaner schizophrenia and schizoaffective disorder patients differs from findings in other ethnic groups, suggesting the possible role of genetic and cultural factors in the prevalence of co-morbid OCD/OCS. Second-generation antipsychotic use amongst schizophrenia and schizoaffective disorder patients with co-morbid OCD/OCS was found to be significantly higher than in those without co-morbid OCD/OCS. Clinical characteristics of Afrikaner schizophrenics and schizoaffective disorder patients with and without co-morbid OCD/OCS are the same, both groups were associated with significant psychopathology and a poor prognosis.

Key words: Obsessive-compulsive disorder (OCD), Obsessive-compulsive symptoms (OCS), Schizophrenia, Schizoaffective disorder, Afrikaner population

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Introduction

Obsessive-compulsive disorder (OCD) and obsessive-compulsive symptoms (OCS) occur in a substantial percentage of patients with schizophrenia or schizoaffective disorder.[1,2,3]

Epidemiological and clinical studies estimate the rate of OC

phenomena in schizophrenia at between 3-59.2%.[4] This is considerably higher than the rate of 2-3% of OCD/OCS in the general population.[5] Higher than expected co-morbidity rates raise the possibility of a common underlying pathology for both disorders. Recent literature suggests some overlap between schizophrenia and OCD in structural and functional brain abnormalities, and in the dopamine and serotonin neurotransmitter systems.[6,7]

Distinguishing between delusions, obsessions, ruminations and preoccupations can be challenging in patients with thought disorder. Delusions are described most often as ego-syntonic and are actively embraced by the patient, whereas obsessions are typically ego-dystonic and are recognised as pathological intrusions.[8] Apart from difficulties in identifying OC symptoms in schizophrenia and schizoaffective disorder, methodological differences result in varying frequencies of reporting of co-morbid OCD in schizophrenia. Direct patient interviews lead to higher frequencies of reporting whereas chart reviews result in lower frequencies.[7] Despite these difficulties, the majority of contemporary studies reveal a considerable base rate of OC features in schizophrenia patients, supporting the validity of the schizophrenia-OCS/OCD association.[9]

Studies have shown evidence of variation in the prevalence of schizophrenia across ethnic groups.[10] It has also been reported that OCD may be less common in certain communities.[11]

Niehaus et al[12] found the prevalence of co-morbid OCD in a Xhosa-speaking schizophrenia group to be significantly lower compared to that found in Caucasian schizophrenia patients, raising the question as to whether genetic and cultural factors play a role in the development of co-morbid OCD/OCS in different ethnic groups.

Hwang et al[13] found that schizophrenic patients with OCD have a worse clinical course than schizophrenic patients without OCD. Such co-morbidity is also associated with poor treatment response, higher levels of negative symptoms, and greater impairment in levels of functioning.

More recent studies agree with Fenton and McGlashan[2] regarding poor outcome in schizophrenia-OCD patients. This group of patients has a less favourable employment record, lower age-appropriate functioning and more severe impairment of social behaviour.[3,13]

Previous studies[14] have described a history of early deviant behaviour in subjects with schizophrenia. Early deviance has also been shown to affect the age of onset of schizophrenia[15], with an earlier onset being associated with a more severe course of illness.[16] Early non-psychotic deviance included poor socialization, extreme fears/chronic sadness, and/or attention/learning impairment.[14] No reports of the incidence of early deviant non-psychotic behaviour in a sub-group of Afrikaner schizophrenia and schizoaffective disorder patients and it's relation to those with and without co-morbid OCD/OCS were found. This relationship was assessed in our study.

One of the objectives of this study was to evaluate the lifetime prevalence and clinical characteristics of OCD and OCS in Afrikaner schizophrenia and schizoaffective disorder patients and to compare clinical characteristics in schizophrenia and schizoaffective disorder patients with co-morbid OCD/OCS and those without co-morbid OCD/OCS. We hypothesized that the prevalence of OCD/OCS in Afrikaner patients with schizophrenia and schizoaffective disorder would be similar to that described in other studies of Caucasian samples.

Methods

Approval for conducting this study was obtained from the Research Ethics Committee of the Faculty of Health Sciences of the University of Pretoria. Written informed consent was obtained from all subjects participating in the study.

Genetic Study

A collaborative ongoing study on the genetics of schizophrenia in the Afrikaner founder population is being conducted in the Department of Psychiatry, University of Pretoria in collaboration with Dr Karayiorgou (Columbia University, New York).[17]

Four hundred subjects with schizophrenia and schizoaffective disorder have been recruited since November 1997. Subjects were recruited from inpatient and outpatient departments of Weskoppies Hospital, Pretoria. The criteria used for being an Afrikaner were: Afrikaans as a first language; having typical Afrikaans surnames of both parents and grandparents on the paternal and maternal side; and geneaological tracings by a geneaologist.

Study subjects and controls

The original genetic study group consisted of four hundred subjects, two hundred and forty eight males (62%), and one hundred and fifty two females (38%). Diagnoses were assigned according to the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV[18] with schizophrenia or schizoaffective disorder and other co-morbid diagnoses.

Fifty-three of these subjects between the ages of 12 and 59 years were identified to have co-morbid OCD/OCS. This subgroup, comprised of 40 males and 13 females, was matched for age of onset of illness and gender with a subgroup of fifty-nine subjects, comprised of 39 male and 20 female patients who do not have OCD/OCS, from the original genetic group.

Age of onset of illness (schizophrenia) was defined as emergence of first psychotic symptoms, according to subjective reports and information from clinical files and family members. Age of onset of schizophrenia or schizoafffective disorder was used as a criterion for matching the study to control group due to the effect it could have on the course and prognosis of the illness.

Patient Assessment

The Diagnostic Interview for Genetic Studies (DIGS version 2.0[19] was utilised after being translated into Afrikaans for use in the original study.[13] The DIGS is a validated clinical assessment tool designed for diagnosing psychotic spectrum disorders, mood disorders as well as anxiety disorders and includes assessment for the lifetime presence of OCD.

The clinical interviewers administering the DIGS were senior psychiatrists at Weskoppies Hospital in Pretoria. Each interviewer had more than twenty years clinical experience and was trained in the use of the DIGS. A chronological summary report was compiled for each subject.

Additional information, including demographic data, medical and treatment history, family history and collateral information, was obtained by a trained research nursing sister from patients, clinical files and family.

A checklist was compiled and completed from information obtained from the narrative chronological summary reports and the DIGS. Information on checklist included: demographic

Table 1: Demographic characteristics

Variables		*Study Group (n=53)*		*Control Group (n=59)*	
Mean Age at time of DIGS interview (years)		*30.6*		*33.6*	
		Frequency (n=)	*%*	*Frequency (n=)*	*%*
Gender	Male	40	75.5	39	66.1
	Female	13	24.5	20	33.9
Marital status	Single	38	71.7	41	69.5
	Married	6	11.3	3	5.1
	Divorced	9	17.0	15	25.4
Highest level of education	Primary	3	5.8	5	8.5
	Secondary	27	51.9	47	79.7
	Tertiary	22	42.3	7	11.8
Employed		17	32.7	13	22.0
Unemployed		35	67.3	46	78.0

data, age at interview, marital status, gender, number of years of education and employment status. Clinical characteristics included age of onset of illness, co-morbid diagnosis, mode of onset of symptoms (acute versus insidious onset), types of obsessions and compulsions, depressive symptoms, presence or absence of suicide attempts, substance abuse, the nature of psychotic symptoms (prominent positive or negative symptoms), pharmacological treatment, number of hospitalisations, and present level of functioning.

The checklist also probed seven areas of early deviant behaviour before age of ten, including social isolation, unprovoked aggression, extreme anxiety, chronic sadness, extreme odd behaviours, attention impairment and learning disabilities.

Statistical analysis

SAS 9.1 and the BMDP Statistical Software package 7.1 were used for statistical analysis. Analysis of descriptive statistics was conducted on the relevant variables within the two groups. Descriptive statistics were computed as mean and frequencies (count and percentages). Chi-squared tests were used to compare and find relationships between the two groups and the other categorical variables. The Student's t – test was used to test for differences between the age of onset of schizophrenia or schizoaffective disorders and the age of onset of OCD/OCS.

A value of $p < 0.05$ was considered significant.

Results

Socio-demographic characteristics

The study group consisted of 53 patients, of whom 40 were males and 13 females diagnosed, according to the DSM-IV criteria, with schizophrenia or schizoaffective disorder with co-morbid OCD or OCS. Within the study group only 2 male patients were siblings. The non-sibship groups consisted of the remaining subjects of both the study (n=51) and control groups (n=59).Mean age at time of DIGS interview for the study group was 30.6 years (range of 12-59 years).

The control group consisted of 59 patients, of which 39 were males and 20 females.

Mean age at time of DIGS interview for the control group was 33.6 years (range of 14-60 years).

Age of onset of OCD/OCS in the study group varied between 7-31 years.Age of onset of schizophrenia and schizoaffective disorder in the study group varied between 11-33 years.

Mean age of onset of OCD/OCS in the study group was found to be earlier (at 18.5 years) than age of onset of schizophrenia or schizoaffective disorder (at 22 years) ($p<0.0001$). [Table 1]

Clinical features

The prevalence of co-morbid OCD/OCS was 13.2% [n=53]. The prevalence of OCD was 10.7% [n=43] and OCS was 2.5% [n=10].Of the study subjects, 75.5% [n=40] were diagnosed with schizophrenia and 24.5% [n=13] with schizoaffective disorder. Schizoaffective disorder (depressive type) occurred in 69.2% [n=9] of patients, and schizoaffective disorder (bipolar type) in 30.8% [n=4] in the study group.Paranoid schizophrenia was diagnosed most often in both the study group (82.9%) [n=34], and the control group (50%) [n=23], followed by undifferentiated schizophrenia in the study group (14.6%) [n=6], and (26.1%) [n=12] in the control group. Other lifetime co-morbid psychiatric disorders diagnosed in both groups included major depressive disorder, other mood disorders, panic disorder, phobias, anxiety disorder and eating disorders. [Table 2]

Table 2: Other lifetime co-morbid psychiatric disorders in study and control groups

Co-morbid diagnosis	*Study Group (n=53)*		*Control Group (n=59)*	
	N	%	N	%
Major Depressive Disorder	15	28.3	3	5.1
Other Mood Disorders	0	0	1	1.7
Panic Disorder	2	3.8	0	0
Phobias	3	5.7	0	0
Anxiety Disorder	5	9.4	0	0
Eating Disorder	1	1. 9	1	1.7

The majority of study patients 94.3% [n=50] had both obsessions and compulsions. More than one type of OCS was observed per patient. Obsessions alone were reported in 5.7% [n=3].

Contamination obsessions (32.1%) [n=17] were commonly reported, followed by religious obsessions (15.1%) [n=8]. Compulsions most often found were repetitive rituals (64%) [n=32], followed by checking behaviour (44%) [n=22]. (Table 3).

Table 3: Obsessions and compulsions in study group of patients with schizophrenia or schizoaffective disorder

Content of obsessions (n=53)	*(n=)*	*%*	*Types of compulsions (n=50)*	*(n=)*	*%*
Contamination	17	(32)	Repeating rituals	32	(64)
Religious	8	(15)	Checking	22	(44)
Pathological doubt	6	(11.3)	Cleaning-washing	9	(18)
Sexual	4	(7.5)	Counting	8	(16)
Aggressive	3	(5.6)	Symmetry-precision	4	(8)
Somatic	2	(3.7)	Hoarding-collecting	3	(6)
Symmetry	2	(3.7)	Ordering-arranging	3	(6)
Multiple obsessions	29	(54.7)	Need to ask/confess	1	(2)
Other	13	(24.5)	Other	9	(18)

There was no significant difference between the two groups with regard to family history of psychiatric illness (p>0.05). No family history of OCD/OCS was found in the two groups.

The onset of psychotic symptoms was found to be insidious in 86.8% of the study group compared to 24.6% in the control group (p<0.0001).Positive symptoms were found to be more frequent in both the study group (48.1%) and control group (42.4%) of patients, compared to negative symptoms being experienced by only 3.8% of the study group.Both groups had a similar incidence of combined positive and negative symptoms of which the frequency in the study group was 48.1% and in 57.6% in the control group.Depressive symptoms were experienced by 73% of the study group compared to 50.1% of the control group.Patients in both groups showed a similar incidence of suicide attempts, namely 36% in the study group and 35.6%in the control group.

Substance abuse in the control group was significantly higher (35.6%) as compared to the study group (19.2%) (p<0.05). Cannabis was the most commonly abused substance in the control group (41.2%) as well as the study group (20.6%). This was followed by alcohol abuse in both groups of patients (36.4% of the control group compared to 12.1% of the study group.)

Second–generation antipsychotic use was found to be statistically more common in the study group (77.4%), compared to the control group of patients (45.8%) (p=0.0008). In the study sample, 77.4% [n=41] of subjects were treated with second-generation antipsychotics, compared to 45.8% [n=27] of subjects in the control group. Conventional antipsychotics were used by 22.6% [n= 12] of the study subjects and 54.2% [n=32] of the control subjects. There was no significant difference between the two groups as far as number of hospitalisations was concerned.

Both groups displayed a similar incidence of early (before the age of 10) non-psychotic deviant behaviour, with the exception of learning disabilities: 32.1% of the study group experienced learning disabilities compared to 54.2% of the control group of patients. (p<0.01). [Table 4]

Table 4: Frequency of early non-psychotic deviant behaviour in the study and control groups

Type of deviant behaviour	*Study Group (n=53)*		*Control Group (n=59)*	
	Frequency (n=)	%	Frequency	%
Social isolation	21	39.6	28	47.5
Unprovoked aggression	7	13.2	7	11.9
Extreme anxiety	10	18.9	9	15.2
Chronic sadness	4	7.5	11	18.6
Extreme odd behaviour	9	17	19	32.2
Attention impairment	21	39.6	33	55.9
Learning disabilities (p<0.01)	17	32.1	32	54.2

Only 5.1% [n=3] of the control group of patients had a high level of global and social functioning whereas none of the study group met this criterion.

Discussion

The prevalence of co-morbid OCD/OCS amongst 400 subjects with schizophrenia and schizoaffective disorder was 13.2%, which is in keeping with the prevalence of co-morbid OCD and schizophrenia estimated at 12.2% by the US National Institute for Mental Health Epidemiologic Catchment Area Study.[5] 10.7% of the study group met the criteria for OCD, whereas 2.5% of patients had OCS that were not severe enough to fulfil the DSM-IV[18] criteria for OCD. Two subjects from the study group were the only siblings included in both study and control groups. Since they formed the only sibship, their inclusion did not significantly affect the prevalence rates of OCD/OCS.

Patients had insight into their OCS and were able to distinguish between psychotic symptoms and OCS at time of interview, thereby avoiding over identification of OCS within our study group. This result supports our hypothesis that the prevalence of OCD/OCS in founder Afrikaner patients with schizophrenia or schizoaffective disorder is significant. The higher prevalence rate in this study is in contrast to the 0.5% co-morbidity of OCD in South African Xhosa-speaking schizophrenia patients.[12]

Dominquez[20] et al also found ethnic differences in their study on a US population group with more OCD-schizophrenic patients in the Hispanic than the Caucasian group with a 32.7% (17/52) prevalence rate of OCS/OCD in schizophrenia.

Weissman et al[11] found variability in symptom presentation of co-morbid OCD across diverse countries suggesting that cultural factors may affect the symptom expression.

Thus, the possibility of genetic and cultural factors interacting with environmental factors could influence the expression of OCD/OCS in patients with schizophrenia or schizoaffective disorder. Further studies are necessary to explore this association.The majority of patients enrolled for the original genetic study were male, with a male to female

ratio of 248/152 (62% males compared to 38% females). This trend is also evident in our study sample whereby the male to female ratio was found to be 40/13, (75.5% males compared to 24.5% females) with a preponderance of male patients diagnosed with schizophrenia or schizoaffective disorder and co-morbid OCD/OCS.

This finding is in keeping with results of a Turkish study[21] of schizophrenia subjects with co-morbid OCD, were the male to female ratio was 15/5. The association between male gender and schizophrenia with co-morbid OCD needs to be explored further.

Recently accumulated data by Tibbo and Warneke[22] and Gross-Isseroff et al[23] suggest that schizophrenia and OCD have a similar age-at onset distribution, with a trend towards earlier age of onset for OCD. With regards to the mean age of onset of OCD/OCS in the study group, we found an earlier age of onset at 18.5 years, compared to the age of onset of schizophrenia or schizoaffective disorder at 22 years. This is in keeping with data found in other studies.[22,23,24]

Age of onset of schizophrenia/schizoaffective disorder is usually in the second to third decade of life, whilst for OCD this figure is in the first to second decade. OCD/OCS may be regarded as a feature of the prodromal phase of schizophrenia/schizoaffective disorder.[4] This finding may be an explanation for the earlier age of onset of OCD/OCS in comparison to the age of onset of schizophrenia.

The analysis of the socio-demographics of the patients suggests that both the schizophrenia-OCD/OCS group and schizophrenia group without OCD/OCS have similarly high rates of unemployment and were less often married. Both groups of patients had a less than favourable employment record. These findings are suggestive of the impact that schizophrenia and schizoaffective disorder have on the social functioning of the patients with and without co-morbid OCD/OCS. The impact of these disorders on school functioning is reflected in the results, with higher percentages of individuals not completing high school.

There were no significant differences between the groups with regards to number of hospitalisations, with the majority of patients reporting more than three admissions since being diagnosed.The frequent hospitalisations further emphasise the impact of the illness on the level of functioning and severity of psychopathology of patients in both groups.

None of the subjects with co-morbid OCD/OCS met the criteria for high functioning, whilst both groups displayed equal prevalence of low and medium level of global and social functioning.

Contamination obsessions, religious obsessions, repetitive rituals and checking behaviour were the most common obsessive-compulsive symptoms reported in the study group. This finding is similar to that of Fenton and McGlashan.[2] In the majority of their sample, the obsessions and compulsions were typical (eg. washing, contamination and rearrangement rituals).

The relationship between OCD/OCS and subtypes of schizophrenia in our study showed an increased prevalence in paranoid schizophrenia at 82.9%, followed by undifferentiated schizophrenia at 14.6% in the study group. This corresponds to findings in other studies,[1,14]

however, the association needs to be explored in future studies.Our findings were that positive symptoms, as well as depressive symptoms occurred more frequently in patients with schizophrenia or schizoaffective disorder and OCD/OCS as compared to patients without co-morbid OCD/OCS, supporting findings of other studies.[2,3]

Substance abuse was significantly higher in the control group without co-morbid OCD/OCS compared to the study group diagnosed with schizophrenia or schizoaffective disorder and co-morbid OCD/OCS. Cannabis was the most common substance of abuse in both groups, followed by alcohol. These findings were in agreement with those found in a study by Poyurovsky et al[24], where the incidence of substance abuse in the group diagnosed with schizophrenia and OCD were one-half of those found in the non-OCD schizophrenia group. This suggests the possibility of OCD in schizophrenia serving as a protective factor against substance abuse.[5]

The onset of psychotic symptoms was found to be insidious in the study group with co-morbid OCD/OCS compared to the control group. These findings, together with co-morbid depressive symptoms occurring in 73.1% [n=38] of patients, are of clinical significance as they point to severity of psychopathology and subsequent psychosocial dysfunction.

The main focus of the study was not on the identification of antipsychotic induced OCD/OCS. However, we found that more than three quarters of the study sample (77.4%) used second-generation antipsychotics as compared to first generation antipsychotics (22.6%).

Reports have indicated that clozapine, olanzapine and risperidone may induce de novo or aggravate pre-existing OCS in schizophrenia patients.[25,26,27] Previous studies have found anti-psychotic induced OCS to affect predominantly males with more compulsive behaviour occurring compared to obsessions. Symptoms usually appeared within 2-3 weeks after initiation of treatment with second-generation antipsychotics and with higher dosages of risperidone use (>4 mg per day.)[4] Future studies on this distinct subgroup of patient, examining the relationship between age of onset of OCD/OCS and the start of treatment with second-generation antipsychotics, type and dosage of treatment, as well as determining severity of OCS, might provide important evidence as to whether second-generation antipsychotics could induce or aggravate pre-existing OCD/OCS amongst study subjects.

Early non-psychotic deviant behaviour has been identified in a study to have some value as a possible endophenotypic marker in schizophrenia and schizoaffective disorder.[27]

Both study and control groups displayed a similar incidence of early non-psychotic deviant behaviour in the first ten years of life, with a significantly higher incidence of learning disabilities being experienced by the group of patients without co-morbid OCD/OCS. The frequency of these symptoms in all domains, encompassing social functioning impairment, mood/anxiety and cognitive impairment in both study and control groups is significant.The presence of early non-psychotic deviant behaviour in Afrikaner schizophrenia or schizoaffective disorder patients is in keeping with findings in previous studies[15] and does not seem to be influenced by a co-morbid diagnosis of OCD/OCS. The presence of early deviance is shown to affect the outcome and prognosis of the disease[15] and our findings may be seen as an indicator of poor prognosis in both the study and control groups.

Limitations

This study has several methodological limitations. Although a structured clinical interview (DIGS) was used, one limitation of the study was that other assessment instruments were not utilised. When OC symptoms or OCD was diagnosed, these symptoms were not quantified by means of the Yale-Brown Obsessive-Compulsive Checklist and Severity Scale (Y-BOCS).The mean age at the time of the DIGS interview was 30.6 years for the study group and 33.6 years for the control group, and this could reflect the risk of a subject developing OCD/OCS at a later stage.The preponderance of male patients included in the study sample compared to female patients could be argued to be due to earlier age of onset of schizophrenia in males. More male patients could have been diagnosed and subsequently enrolled in the study. The difference in age of onset of illness between male and female probands in the study group was not taken into account.

Information regarding early deviant behaviour was obtained from the patients. The information may have been more reliable if access to school records and collateral information from family members were available.The current mental state of the patients may have influenced the accuracy of their account of their early lives and past psychiatric history.

Conclusion

The prevalence rate of 13.2% of co-morbid OCD/OCS in the Afrikaner schizophrenia and schizoaffective disorder patients supported our hypothesis that the prevalence is similar to studies in other Caucasian populations. It is however, in contrast to findings in a Xhosa-speaking schizophrenia population, suggesting the possible role of genetic and environmental factors in the prevalence of co-morbid OCD/OCS in schizophrenia and schizoaffective disorder in different ethnic groups.Second-generation antipsychotic use amongst schizophrenia and schizoaffective disorder patients with co-morbid OCD/OCS was found to be significantly higher than in those without co-morbid OCD/OCS.Clinical characteristics of Afrikaner schizophrenia and schizoaffective disorder patients with and without co-morbid OCD/OCS are the same, both groups being associated with significant psychopathology and a poor prognosis.

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