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Clinical and Demographic Landscape of Schizophrenia in India: Findings from a Multicenter Real-World SCHIZO INDIA Study

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Abstract

Background: The current real-world study aims to understand demographic details, clinical profiles, comorbidities and management in schizophrenia. ***Methods:*** This study employed retrospective, multi-center, observational design to investigate the demographic & clinical profiles of patients diagnosed with schizophrenia. Data was collected from patient records across diverse healthcare settings in India. ***Results:*** The study population comprised total of 5085 individuals, with mean age of 48.5 years. The most common positive symptom reported was hallucinations (19.5%), followed by delusions (17.8%). Lack of motivation was the most frequent negative symptom (21.9%) & difficulties with working memory were most prevalent cognitive symptoms (33.7%). Catatonia was observed in (12.8%) of patients. Anxiety was reported by (10.9%) of patients, Obsessive-compulsive disorder (OCD) was present in (16.8%) of patients, & (13.6%) reported substance abuse. Depression was identified in (20.8%) of patients with (13.8%) taking antidepressants. There was significant reduction in the PANSS (Positive and Negative Syndrome Scale) score from baseline. Olanzapine was frequently prescribed antipsychotic, with escitalopram commonly used as adjunct therapy. ***Conclusion:*** The study shows a high prevalence of schizophrenia with diverse symptoms, co-morbidities, and treatment approaches. The study highlights the need for better data refinement and standardization to improve research accuracy and patient care in schizophrenia.

Keywords: ***Schizophrenia, demographic profiles, clinical characteristics, comorbidity, India***

Introduction

Schizophrenia, a severe disorder, significantly impacts individuals and society, often causing persistent symptoms and disability. This condition is associated with high unemployment rates (80-90%), and substantially reduced life expectancy (10-20 years), making it a major global health concern. In India specifically, prevalence ranges from 0.42% to 1.41% [1-4].

Schizophrenia disrupts perception, impacting thought, emotion, and behavior. The key symptoms include delusions, hallucinations (especially auditory), disorganized speech and thinking, abnormal motor behavior, and negative symptoms characterized by reduced emotion, motivation, and social withdrawal. These Symptoms is typically categorized into three domains: positive, negative, and cognitive. While positive symptoms tend to fluctuate over time, negative and cognitive symptoms often persist and significantly contribute to functional impairment [5-10].

Despite significant advances in genetic and neuroimaging research, schizophrenia remains a clinical diagnosis. The Diagnostic and Statistical manual of Mental Disorders, Fifth Edition (DSM-5) and International Classification of Diseases 11th Revision (ICD-11) have refined diagnostic criteria, focusing on core symptoms such as delusions, hallucinations, disorganized thinking, negative symptoms while removing less clinically useful subtypes. DSM-5 requires functional impairment for diagnosis, unlike ICD-11 [11].

Diagnostic challenge persists due to the lack of biological markers, requiring careful differential diagnosis. Clinicians must distinguish schizophrenia from brief psychotic disorder, delusional disorder, medical conditions causing psychotic symptoms, medication-induced disorders, mood disorders with psychotic features and substance abuse. This differential diagnosis is critical for appropriate treatment planning [12].

The pathophysiology of Schizophrenia is complex, involving widespread brain abnormalities, including prefrontal cortex changes and gray/white matter alterations. Dopaminergic and, critically, glutamatergic (NMDA receptor, parvalbumin-positive interneuron) dysfunction underlies symptoms [13].

A “Three-compartment model” has been proposed to understand schizophrenia’s pathophysiology: the first compartment encompasses psychotic symptoms (hallucinations, delusions); the second involves cognitive impairment (including positive formal thought disorder, impaired attention, and information processing); and the third comprises negative symptoms (restricted affect, poverty of speech, diminished interests, reduced sense of purpose, and decreased social drive) [14].

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Pharmacological Treatment of Schizophrenia

Effective management of schizophrenia requires a biopsychosocial approach, that integrating pharmacological intervention with psychotherapy and rehabilitation to reduce symptoms, prevent relapse, and improve functioning. Antipsychotic medications, primarily through dopamine receptor blockades, are effective in managing positive symptoms but have limited efficacy for negative symptoms and can cause significant side effects. Antipsychotics like Haloperidol is effective for acute psychosis, while clozapine has shown efficacy in treatment resistant cases. Current research aims to develop safer, more effective drugs, particularly for negative and cognitive symptoms [15].

Effective interventions include family psychoeducation, stress management, social skills training, and rehabilitation services such as supervised housing and occupational training. These diverse approaches are typically all coordinated through case management to ensure comprehensive care [15].

The shift from institutional to community-based care has highlighted systemic challenges including fragmented services, inadequate community support, homelessness, and service access difficulties. Improving coordination, accessibility, and early intervention remains crucial for successful community integration and enhanced quality of life for individuals with schizophrenia [15].

This study aims to provide a comprehensive characterization of schizophrenia by evaluating the demographic characteristics of affected individuals and documenting their presenting symptoms, medical co-morbidities, and psychiatric co-morbidities.

Methods

Study Design & Population

This retrospective, multi-center, observational study, conducted across diverse healthcare settings in India (hospitals, clinics, and healthcare institutes), examined individuals diagnosed with schizophrenia. Patient selection was determined by the treating physician's discretion, without pre-defined inclusion or exclusion criteria, relying on their clinical judgment.

Data Collection

This study utilized retrospective data collection from existing patient records, with physicians documenting information via electronic Case Report Forms (eCRFs). The collected data encompassed a wide range of patient information, including demographic characteristics (age, gender), diagnosis and age at onset, family history, symptom severity and duration, presenting symptoms (positive, negative, cognitive), recent neurological impairments, psychiatric comorbidities (depression, anxiety, OCD, substance abuse), and prescribed antipsychotic drugs and current treatment strategies. Notably, no additional evaluations or investigations were conducted specifically for this study.

Ethical Considerations

Ethical approval was obtained, with a waiver of consent due to the retrospective, de-identified data. The study followed ICMR guidelines, ensuring minimal risk and strict data confidentiality. Authorized personnel had limited access, and data was available for audits. Statistical analysis will determine prevalence, symptom profiles, comorbidities, and correlations.

Statistical Analysis

The statistical analysis was conducted using SAS 9.4 and SPSS (version 27). Descriptive statistics were used to summarize the demographic and clinical characteristics of the study population. Continuous variables, such as age, weight, and height, were presented as means with standard deviations (SD), medians, ranges, and interquartile ranges (Q1, Q3). Categorical variables, including gender, clinical history, symptom status, and medication use, were presented as frequencies and percentages.

The relationship between gender, symptom onset, and age was analyzed using a two-way mixed-effects model. This model assessed the independent effects of gender and symptom onset on age, as well as their interaction. The change in PANSS score from baseline to post-baseline was evaluated using the Wilcoxon signed-rank test. A p-value of <0.05 was considered statistically significant for all analyses.

Results

Patient Demographics

The study population (N = 5085) had a mean age of 48.5 years (SD = 13.5), with a predominance of males (61.9%). The mean weight and height of the participants were 67.4 kg (SD = 10.5) and 164.4 cm (SD = 7.3), respectively. In terms of clinical history, 50.7% of patients had a symptom onset within 3 years, and 33.8% within 0.5 years. A significant majority (71.5%) of the patients reported no family history of schizophrenia. Detailed demographic and baseline characteristics are presented in Table 1.

Table 1: Demographic and Baseline Characteristics - Schizophrenia Population

	Overall Total (N=5085)
Age (Years)	
N	5085
Mean ± SD	48.5 ± 13.5
Gender, n (%)	
Female	1937 (38.1)
Male	3148 (61.9)
Weight (kg)	
N	5085
Mean ± SD	67.4 ± 10.5
Height (cm)	
N	5085
Mean ± SD	164.4 ± 7.3
Clinical history (Onset of symptoms (Years)), n(%)	
3	2580 (50.7)
0.5	1718 (33.8)

6-10	637 (12.5)
>10	150 (2.9)
Clinical history (Family history), n(%)	
Negative	3634 (71.5)
Positive	1451 (28.5)

Presenting Symptoms

The most common positive symptom reported was hallucinations (19.5%), followed by delusions (17.8%). Lack of motivation was the most frequent negative symptom (21.9%), and difficulties with working memory were the most prevalent cognitive symptoms (33.7%). Table 2 provides a detailed breakdown of these findings.

Table 2: Proportion of Patients with Clinical History Presenting Positive, Negative, and Cognitive Symptoms

Symptoms Status	Symptoms	Overall Total (N=5085) n (%)
Positive	Hallucinations	991 (19.5)
	Delusions	905 (17.8)
Negative	Lack of motivation	1116 (21.9)
Cognitive	Difficulties with working memory	1713 (33.7)
Percentages are computed using N provided in the Column header		

Catatonia

Catatonia was observed by 12.8% of the participants, while the majority (87.2%) did not exhibit catatonic symptoms. These results are shown in Table 3.

Table 3: Proportion of Patients with Catatonia

Symptoms	Clinical Status	Overall Total (N=5085) n (%)
Presence of Catatonia	No	4436 (87.2)
	Yes	649 (12.8)
Percentages are computed using N provided in the Column header		

Comorbidities

Anxiety was reported by 10.9% of participants who were taking anti-anxiety medication. Obsessive-compulsive disorder (OCD) was present in 16.8% of participants, and 13.6% reported substance abuse. Depression was identified in 20.8% of participants, with 13.8% taking antidepressants. Recent neurological impairments were infrequent, with stroke (0.7%) and head injury (0.6%) being the most reported. Table No. 04 and Table 5 provide further details on anxiety and other comorbidities, respectively.

Table 4: Proportion of Patients with Anxiety

Symptom	Status	Overall Total (N=5085) n (%)
Anxiety	No	4043 (79.5)
	Yes: was the patient taking anti-anxiety medication? -Yes	554 (10.9)
	Yes: was the patient taking anti-anxiety medication? -No	337 (6.6)
	Information not available	151 (3.0)
Percentages are computed using N provided in the Column header		

Table 5: Proportion of patients with Obsessive-compulsive Disorder, Substance Abuse, Recent Neurological Impairments, and Depression

Symptom	Status	Overall Total (N=5085) n (%)
Obsessive-Compulsive Disorder	No	4032 (79.3)
	Yes	852 (16.8)
	Information not available	201 (4.0)
Substance Abuse	No	4129 (81.2)
	Yes	692 (13.6)
	Information not available	264 (5.2)
Recent neurological impairments	No	4927 (96.9)
	Yes-Stroke	34 (0.7)
	Yes-Head injury	32 (0.6)
	Yes-Altered consciousness or memory problems	28 (0.6)
	Yes-Seizures	22 (0.4)
	Yes-Visual impairment	18 (0.4)
	Yes-Dizzy spells	12 (0.2)
	Yes-Marked tremor	6 (0.1)

	Yes-Fainting episodes	5 (0.1)
	Other-No	1 (0.0)
Depression	No	3892 (76.5)
	Yes: was the patient taking antidepressant medication? -Yes	703 (13.8)
	Yes: was the patient taking antidepressant medication? -No	354 (7.0)
	Information not available	136 (2.7)

Change in PANSS Score

There was a significant reduction in the PANSS (Positive and Negative Syndrome Scale) score from baseline to week 12. ($p < 0.0001$), indicating an overall improvement in symptoms. The details of this change are presented in Figure 1.

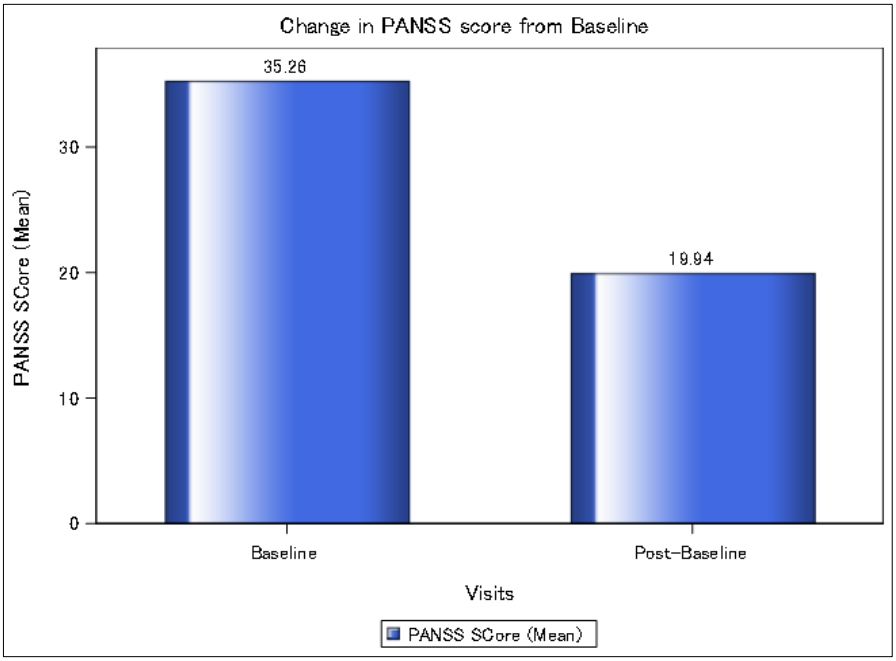

Figure 1: Change in PANSS score from Baseline)

Prescribed Antipsychotic Medication

The table no.06 presents the distribution of prescribed antipsychotic within the study population (N = 5085).

Prescribed Antipsychotic Medications: Olanzapine (5 mg, 10 mg) was the most frequently prescribed antipsychotic in 1547 cases (30.42%), followed by cariprazine (3 mg, 4.5 mg) in 1469 cases (28.88%), and amisulpride (50 mg/100 mg/200 mg) in 432 cases (8.49%), aripiprazole (10 mg) in 213 cases (4.18%).

Other Prescribed Medications: Escitalopram (10 mg) was prescribed in 1003 cases (19.72%). Less commonly prescribed medications included donepezil (5 mg) in 247 cases (4.85%), clonazepam (0.5 mg) in 138 cases (2.71%), and venlafaxine (75 mg) in 36 cases (0.70%).

Table 6: Summary of Prescribed Antipsychotic Medication

Prescribed Antipsychotic Drug	Overall Total (N=5085), n (%)
Olanzapine (5mg ,10mg)	1547 (30.42)
Cariprazine (3 mg, 4.5mg)	1469 (28.88)
Aripiprazole (10 mg)	213 (4.18)
Amisulpride (50mg/ 100mg/ 200mg)	432 (8.49)

Discussion

This large-scale Schizophrenia India study (N = 5085) contributes significantly to our understanding of schizophrenia presentation in the Indian population. Our study population demonstrated a male dominance (61·9%), consistent with other studies reporting higher diagnosed rates of schizophrenia in males globally (Ochoa et al., 2012; McGrath et al., 2008) [16,17]. The mean age of 48.5 years suggests that our sample largely represents patients with established illness rather than first-episode cases.

The finding that 50.7% of patients. had symptom onset within 3 years, while 33.8% had onset within 0.5 years indicates a mixed cohort of both recent-onset and more chronic cases. The negative family history (71.5%) aligns with the understanding that most schizophrenia cases are sporadic rather than familial, though this finding should be interpreted cautiously given potential underreporting due to stigma around mental illness in the Indian context.

The symptom profile revealed that hallucinations (19.5%) and delusions (17.8%) were the most common positive symptoms.

The predominance of lack of motivation (21.9%) among negative symptoms is particularly noteworthy, as negative symptoms significantly impact functional outcome and quality of life but often receive less clinical attention than positive symptoms. As demonstrated by Favrod et al.'s study examining the Positive Emotions Program for Schizophrenia (PEPS), negative symptoms like apathy and anhedonia are increasingly recognized as treatment targets that can significantly improve patient outcomes when specifically addressed (Favrod et al., 2019) [18].

In a study where relationships between positive and negative symptoms and specific neuropsychological deficits in a stable schizophrenia patients assessed. Their findings support the hypothesis that positive and negative symptoms may be associated with distinct neuropsychological deficits and thus with distinct neurological substrates and point to the need to address both positive

and negative dimensions when studying schizophrenia (Berman 1997) [19].

High prevalence of working memory difficulties (33.7%) among cognitive symptoms highlights the importance of cognitive assessment and rehabilitation in treatment planning. In a study 56 patients with schizophrenia (positive subtype = 31; negative subtype = 25) were evaluated. It is concluded that the negative subtype of schizophrenia is associated with significantly greater cognitive dysfunction compared to the positive subtype, particularly in higher-order executive functions such as information processing, planning, comprehension, and visual-motor skills [20].

The 12.8% prevalence of catatonic in our sample is higher than rates typically reported in western studies, reflecting differences in either clinical presentation or diagnostic practices across culture. A prospective cohort study examined catatonic schizophrenia in comparison to other schizophrenia types using data from over 90,000 individuals. Among 568 schizophrenia cases, 7.6% were catatonic subtypes. Importantly, catatonic schizophrenia patients were significantly more likely to attempt suicide, suggesting a distinct clinical and etiological profile. These findings support the view that catatonic schizophrenia may represent a unique subtype (Kleinhaus 2010) [21]. Another study explored a distinct form of catatonia—Idiopathic catatonia that does not align with standard psychiatric diagnoses like schizophrenia. Researchers compared clinical features of schizophrenia-associated catatonia (n=21) and idiopathic catatonia (n=13) in patients from a psychiatric ward in Ahmedabad, India. While the schizophrenia group had a longer illness duration and higher general psychopathology (BPRS scores), the idiopathic group showed more severe and numerous catatonic signs, especially negativism, waxy flexibility, mitgehen, and ambitendency. The findings suggest that idiopathic catatonia may be a separate subtype with a unique course and prognosis, warranting further investigation (Krishna 2011) [22].

Comorbidity findings revealed rates of depression (20.8%), OCD (16.8%), and substance abuse (13.6%), consistent with international literature indicating high comorbidity (depression 50%, OCD 23%, and substance abuse 47%) between schizophrenia and these conditions [23]. In a meta-analysis investigated the prevalence of comorbid major depressive disorder (MDD) in individuals with schizophrenia. The study analysed 18 studies involving 6,140 stabilized outpatients, the pooled prevalence was found to be 32.6% indicating a high burden (Etchecopar-Etchart 2020) [24]. The discrepancy between depression prevalence (20.8%) and antidepressant use (13.8%) suggests potential undertreatment of affective symptoms.

The low rates of neurological comorbidities such as stroke (0.7%) and head injury (0.6%) observed in our sample deserve special attention when interpreting our findings. These rates appear notably lower than what might be expected based on recent systematic reviews and meta-analyses. Molloy [25] et al. conducted a meta-analysis that demonstrated a significant association between traumatic brain injury (TBI) and schizophrenia (OR=1.65; 95% CI=1.17-2.32), with an even stronger association (OR=2.8; 95% CI=1.76-4.47) in individuals with genetic predisposition to psychosis. Similarly, Chan et al.[26] revealed that schizophrenia patients exhibit elevated stroke risk (relative risk=1.55; 95% CI: 1.31-1.84) compared to non-schizophrenia controls, with this increased risk persisting across both sexes and different geographical regions. The discrepancy between these epidemiological findings and our observed rates suggests potential underdiagnosis of these neurological conditions in our sample. These findings highlight the need for improved neurological assessment in schizophrenia patients, particularly given the evidence that these patients experience not only increased stroke risk but also elevated post-stroke mortality (hazard ratio=1.37; 95% CI: 1.30-1.44) as reported by Chan et al.[26] better recognition and management of these neurological comorbidities could significantly impact long-term outcomes in this vulnerable population.

The significant reduction in PANSS scores from baseline demonstrates the effectiveness of current treatment approaches in this population. The medication prescription patterns, featuring olanzapine, escitalopram, and cariprazine as commonly prescribed agents, reflect both local prescribing practices and global trends in schizophrenia pharmacotherapy. The inclusion of escitalopram among frequently prescribed medications highlights the recognition and treatment of comorbid depression in this population.

This study had several limitations that should be acknowledged. First, its retrospective design may introduce inherent biases, including potential selection bias, which could influence the generalizability of the findings. The data were collected from existing records, which may have varied in completeness and accuracy.

A notable limitation of the study was the absence of a clear and standardized definition for symptom duration. This lack of clarity in the data presented a significant obstacle to researchers seeking to establish meaningful correlations between the length of time an individual experiences symptoms and other clinical variables. Accurate and consistent measurement of symptom duration is essential for understanding the progression of schizophrenia and for evaluating the long-term impact of various treatment interventions. Future prospective studies with well-defined criteria for symptom duration and standardized data collection protocols are warranted to address these gaps.

Conclusion

This study offers valuable insights into the demographic and clinical profiles of patients with schizophrenia within a real-world setting in India. The findings highlight several key aspects of the presentation of disease in this population. Specifically, the study found a high proportion of patients with a clinical diagnosis of schizophrenia, emphasizing the significant burden of the disease. Furthermore, the research documented the prevalence of a diverse range of symptoms and co-morbidities, indicating the complex nature of the illness. Finally, the study observed a variety of treatment approaches, reflecting the challenges in managing this heterogeneous condition. The study concludes by reiterating the need for improved data refinement and standardization to enhance the interpretability and robustness of future research on schizophrenia in India.

Declarations

Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

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Ethical Clearance

Ethical approval was obtained, with a waiver of consent due to the retrospective, de-identified data.

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