# Original Article

# Prevalence of First Rank Symptoms in Mania

Shobhit Kumar Prasad, Sujata Sethi[1], Aarti Karahda[1]

Department of Psychiatry, Maharaja Agrasen Medical College, Hisar, [1]Department of Psychiatry, Pt BD Sharma PGIMS, Rohtak, Haryana, India

**ABSTRACT**

**Background:** First rank symptoms (FRSs) are seen frequently in mania. There has been a scarcity of data published in consideration with the Indian population on the prevalence of FRS in mania. **Aim:** The aim of this study is to explore the pattern of occurrence of FRS and assess association between the presence of FRS and severity of mania. **Subjects and Methods:** A cross-sectional study was conducted in the psychiatry department of tertiary care institution of North India. Fifty patients selected by convenient sampling, diagnosed with mania as per Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-5) classification. Informed consent taken, semi-structured per forma used, present state examination-9 Hindi version used for FRS, Young Mania Rating Scale (YMRS) to assess severity of mania. Descriptive statistics were used. The Chi-square test was used for the comparison between the groups. Mann–Whitney U-test was used for the comparison between individual FRS and YMRS score. **Results:** Mean age FRS + was 35.32 years ($\pm$13.85), 71% were males; majority belonged to urban locality, married, residing in nuclear family, educated up to matriculation, and unemployed. There was no significant association of these variables with FRS. The Presence of $\geq$1 FRS was 62%; voices commenting on one's action (83.9%), voices arguing (77.4%), thought broadcast (38.7%), delusional perception (23.8%), thought withdrawal and thought echo (both 12.9%), made volitional acts, somatic passivity, and thought insertion (in 3.2% each). None had the presence of made feelings and made impulse/drives. Mean YMRS was 40.16 $\pm$ 7.91. No statistical significance found between FRS and YMRS scoring, except for thought withdrawal. **Conclusions:** The present study confirms FRS in substantial cases of mania. FRS in mania can lead to misdiagnosis of schizophrenia, leading to inadequate management, delayed appropriate treatment, and poor prognosis.

**KEYWORDS:** *First rank symptoms, mania, present state examination-9, Young Mania Rating Scale*

## INTRODUCTION

Kurt Schneider found out that there are many symptoms that are typical of schizophrenia and thus have a first rank status in the hierarchy of potentially diagnostic symptoms of schizophrenia. He asserted that with the use of these first rank symptoms (FRS), diagnostic precision for schizophrenia has been achieved in more than 98% of cases.[1] However, there has been some criticism in recent years about their reliability and the accuracy of schizophrenia diagnosis.[2]

The lack of a reliable laboratory examination for schizophrenia spectrum disorders is a fundamental issue inherent in the specificity evaluation of the FRS, because of which a clinical interview focussed on diagnostic criteria remains the key to correct the diagnosis.[3] Numerous attempts have been made to study the incidence of FRS in an affective disorder that can lead to diagnosis.[4] Many lines of evidence indicate that patients with psychotic symptoms in bipolar disorder are very similar in genetic and neurobiological terms to patients with schizophrenia,

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and that several similar psychopharmacological treatments are successful in both conditions.[5]

Previously conducted systematic reviews in the context of affective disorder revealed a prevalence of FRS in 22%–29%, suggesting that the occurrence of these symptoms in the acute period is not specific to schizophrenia.[6] The prevalence of FRS in mania has been identified in previously published studies varying from 29% to 63%.[7] Recent studies in the Indian subcontinent have shown a significantly lower incidence of FRS in mania, of about 15%–19.3%.[8,9]

The severity of individual first-rate signs has varied across several studies. Some have found passivity experiences in preponderance, while some have described experience of phenomenon related to hearing of voices discussing or commenting on one's action in major prevalence. The intermix features of both schizophrenia and affective disorder can lead to misdiagnosis in almost 31% of the patients with bipolar disorder.[10]

The bulk of data in this field is from the Western literature. There has been a scarcity of published evidence on the prevalence of FRS in cases diagnosed with mania in view of the Indian population. The study was intended to investigate the pattern of incidence of FRS in cases of mania. Along with, the association between severity of mania and FRS has been assessed.

## SUBJECTS AND METHODS

### Study design

A cross-sectional study was conducted at the department of psychiatry, including patients attending outpatient services as well as indoor patients, in a tertiary care medical college of North Indian setting. Patients were recruited during time frame April 2018 to March 2019.

### Ethical consideration

After the approval of proposal by Ethical Review Committee of the institution, the study was conducted in controlled clinical setting. Confidentiality was maintained by keeping the personal information to primary investigator. The statistical data were accessed only by research coordinating committee. Informed written consent was taken with autonomy to withdraw at any point if they wish to. The concluding finding was communicated to interested participants.

### Study sample

Convenient sampling was done. Fifty patients were recruited, keeping 95% confidence interval (CI) and considering margin of error of 15%. The sample size was calculated in reference to a previous study which reported FRS in 29% of total cases of psychotic bipolar disorder.[7]

Taking the prevalence to be 29%, allowable error to be 15% and CI of 95%.

$$n = \frac{Z_{\alpha/2}^2 pq}{L^2}$$

Factor $(Z_{\alpha/2})$ = 1.96

P = prevalence of FRS in previous study = 29%

Q = 100 − P = 71%

L = Allowable error = 15%

The sample size from above calculation came out to be 36.6. Hence, in the current study, 50 participants were selected.[7]

### Procedure

Patients of either gender, aged above 17 years with the diagnosis of manic episode as per DSM 5 classificatory system were taken for the inclusion in the study.[11] The patients with diagnosed neurological and/or other psychiatric comorbidity were not considered for the study. All the patients fulfilling the study criteria and potentially suitable for the study were screened and evaluated by the researcher after discussion with the supervisor/consultant. An informed consent was obtained after explaining the aim, objectives, and method of the study. The identity of the patient was kept confidential. Patient along with relatives/attendants were interviewed to gather information about the index episode as well as about the previous episode (s) of psychiatric illness, if any. A semi-structured sociodemographic pro forma was used to gather information about sociodemographic profile of the patients. In addition to a full psychiatric case history, Hindi version of present state examination-9 (PSE-9) was used to gather the psychopathology including FRS.[12] If the patient was too disturbed for PSE-9 to be fully administered at the first interview, only the section 18–20 for current behavior, affect and speech were rated in the first session and rest of the sessions were completed later, as soon as the patient sufficiently improved to administer the schedule. Severity of mania was determined by the Young Mania Rating Scale (YMRS).[13]

### Statistical analysis

Data were analyzed using the "Statistical Package for the Social Sciences" (SPSS) software v23.0, Armonk, New York (USA): IBM Corp. Descriptive statistics were applied. Continuous variables were summarized as means and standard deviations and categorical variables as counts and percentages. The comparison of sociodemographic variables with FRS was done using the Chi-square test using 0.05 as the level of significance. The association between severity of mania using YMRS scale and FRS done using Mann–Whitney U-test with 0.05 as the level of significance.

# RESULTS

A total of 50 cases were included for the study. The mean age of the sample was 33.44 ± 13.22 years. Tables 1 and 2 depict the sociodemographic variables and clinical profile of the sample.

Nine cases had the 1st onset episode of mania, while rest of the cases had more than 1 episode. Twenty cases had history of only manic episodes ranging from number 2 to 9 episodes. Seven cases had a history of both manic and depressive episodes in the past and 1 case had only history of depressive episode in the past. Thirty-six percent had abrupt to acute onset, 26% had sub-acute onset, while rest had insidious onset. Mean YMRS score was 38.70 ± 7.79 for the whole sample, with range from 21 to 54.

## Sample with presence of first rank symptoms

From the total sample of 50 cases, a total of 31 cases (62%) had the presence of one or more FRS. Table 3 shows the combined sociodemographic details of the sample with the presence of FRS. No significant statistical association was found between the presence of FRS and sociodemographic variables.

Possible precipitating factor for the current episode in FRS + sample was known in 11 cases, with majority of the episode started because of stoppage or discontinuation of the ongoing medications for either acute control or prophylaxis management of mood disorder. In 64.5% of the cases, no precipitating factor could be elicited. Positive family history of psychiatric illness was present in 9.7% of cases, which was mainly mood disorder. There was no significant association found between the presence of family history of psychiatric illness and FRS ($P = 0.288$).

Physical comorbidity was present in 12.9% of cases, with these cases having cardiovascular disorders. There was no significant association found between the presence of physical comorbidity and presence of FRS ($P = 0.397$). The total duration of illness was found to be ranging from 2 weeks to 35 years, and current duration of present episode ranged from 1 week to 4 months.

Table 4 shows the presence of individual FRS. The symptoms had copresence with each other. Regarding individual frequency of FRS, voices commenting on one's action ($n = 24$) and voices arguing ($n = 26$) were in majority, followed by thought broadcasting phenomenon ($n = 12$), delusional perception ($n = 8$), thought echo and thought withdrawal ($n = 4$ each), and least occurrence of thought insertion, somatic passivity and made volitional acts ($n = 1$ each). However, there were no cases with the presence of made impulses/drives and made feelings.

### Table 1: Sociodemographic variables of the sample

| Socio-demographic variable | *n* (%) |
| --- | --- |
| Gender | |
| Male | 35 (70) |
| Female | 15 (30) |
| Religion | |
| Hindus | 44 (88) |
| Sikhism | 4 (8) |
| Muslims | 2 (4) |
| Type of locality | |
| Rural | 38 (76) |
| Urban | 12 (24) |
| Marital status | |
| Married | 32 (64) |
| Single | 16 (32) |
| Widow | 2 (4) |
| Educational status | |
| Illiterate | 4 (8) |
| Under-matriculation | 16 (32) |
| High school | 19 (38) |
| Graduate | 9 (18) |
| Postgraduate | 2 (4) |
| Occupational status | |
| Unemployed | 18 (36) |
| Student | 5 (10) |
| Semi-skilled | 6 (12) |
| Skilled | 10 (20) |
| Professional | 5 (10) |
| Homemaker | 11 (22) |
| Family type | |
| Nuclear | 31 (62) |
| Joint | 19 (38) |

### Table 2: Clinical profile of the total sample (*n*=50)

| Clinical Factors | *n* (%) |
| --- | --- |
| Probable precipitating factor for the episode | |
| Discontinuation of medications | 12 (24) |
| Decreased sleep | 8 (16) |
| Fever | 1 (2) |
| Not known | 29 (58) |
| Family history of psychiatric illness | |
| Present | 4 (8) |
| Absent | 46 (92) |
| Physical comorbidity | |
| Present | |
| Hypertension | 3 (6) |
| RHD/severe MS | 1 (2) |
| Absent | 46 (92) |

RHD: Rheumatic heart disease, MS: Mitral stenosis

YMRS score was found to be 40.16 ± 7.91 for the sample with FRS, with range from 21 to 54. There was no statistical association found between the presence of FRS and the severity of mania ($P = 0.093$). However, among the individual FRS, though withdrawal

**Table 3: Sociodemographic variables of sample with the presence of first rank symptoms**

| Sociodemographic variables | FRS+, *n* (%) | *P* |
|---|---|---|
| Mean age (years) | 35.32±13.85 | 0.542 |
| Gender | | |
|   Male | 22 (71) | 0.849 |
|   Female | 9 (29) | |
| Religion | | |
|   Hinduism | 27 (87.1) | 0.812 |
|   Sikhism | 3 (9.6) | |
|   Islam | 1 (3.2) | |
| Type of locality | | |
|   Urban | 24 (77.4) | 0.764 |
|   Rural | 7 (22.6) | |
| Marital status | | |
|   Single | 9 (29) | 0.769 |
|   Married | 21 (67.7) | |
|   Widowed | 1 (3.3) | |
| Type of family | | |
|   Nuclear | 18 (58.1) | 0.464 |
|   Joint | 13 (41.9) | |
| Educational status | | |
|   Illiterate | 1 (3.2) | 0.208 |
|   Under-matric | 12 (38.7) | |
|   Matriculation | 12 (38.7) | |
|   Graduates | 4 (12.9) | |
|   Postgraduates | 2 (6.5) | |
| Occupational status | | |
|   Unemployed | 12 (38.7) | 0.236 |
|   Student | 1 (3.2) | |
|   Semi-skilled | 5 (16.1) | |
|   Skilled | 4 (12.9) | |
|   Professional | 2 (6.5) | |
|   Homemaker | 7 (22.6) | |

FRS: First rank symptoms

**Table 4: Incidence of first rank symptoms**

| Frequency of FRS | *n* (%) | Association between individual FRS and YMRS (*P*) |
|---|---|---|
| Voices arguing | 24 (77.4) | 0.183 |
| Voices commenting on one's action | 26 (83.9) | 0.087 |
| Thought echo | 4 (12.9) | 0.185 |
| Thought broadcast | 12 (38.7) | 0.306 |
| Thought withdrawal | 4 (12.9) | 0.036 |
| Thought insertion | 1 (3.2) | 0.880 |
| Somatic passivity | 1 (3.2) | 0.440 |
| Made volitional acts | 1 (3.2) | 0.440 |
| Made impulses/drives | 0 | - |
| Made feelings | 0 | - |
| Delusional perception | 8 (25.8) | 0.185 |

FRS: First rank symptoms, YMRS: Young Mania Rating Scale

phenomenon exhibited statistical significance with the YMRS scoring severity (*P* = 0.036).

# DISCUSSION

Schneiderian FRSs have been among the most important diagnostic criteria for schizophrenia in diagnostic systems in the past and are generally being de-emphasized in the contemporary diagnostic systems. Several studies have been performed in patients with mania where presence of first rank symptom has been identified, frequently leading to diagnostic uncertainty due to similar symptoms. Our research was an attempt to assess the prevalence of FRS in patients of mania and to find the association between severity of mania and the existence of FRS.

Thirty-one cases (62%) had one or more FRS. A higher prevalence of FRS in mania was observed, which is contradictory to previous studies.[4,9,14,15] This large difference compared to previous studies and a higher number of cases with positive FRS can possibly be explained using convenient sampling when selecting cases. Cases were chosen from both the inpatient and outpatient services of a psychiatric tertiary care center in Northern India, from which the cases were primarily chosen at the acute stage and at the height of their illness. It may have contributed to a greater probability of psychotic symptoms arising in the identified sample. This is evident from the severity grading of mania using YMRS score which was higher for most of the sample.

The mean age of the sample with the presence of FRS, was found to be 35.32 ± 13.59 years, which was almost the same as the previous research by Channa *et al*.[9] However, there was no significant association between age and presence of FRS (*P* = 0.542), as compared to the previous studies.[9] Similar to the analysis by Conus *et al*., there was a majority of males in FRS positive group.[15] There is quite a difference in gender disparity in the sample examined, which can be attributed to the prevalent gender inequality in this part of society in India, where the illness of a male member is given more consideration than that of a female member. However, no significant association was found between gender and presence of FRS (*P* = 0.849), which is similar to the study by Conus *et al*.[15] the majority belonged to the rural area of the region, which may have been attributable to the tertiary care center being located in a Tier-III city and on outskirts of the capital of India, and to most of the remote areas of Haryana, Uttar Pradesh, Rajasthan, Delhi, and Punjab. No significant association was found between the existence of FRS with religion (*P* = 0.812), locality (*P* = 0.764), marital status (*P* = 0.769), family type (*P* = 0.464), educational status (*P* = 0.208), and occupational status (*P* = 0.236), similar to the study by Channa *et al*.[9]

Possible precipitating factors for the current episode were also included in the study sample, in which the causes were primarily discontinuation of medications, decreased sleep, and fever. Discontinuation of ongoing medications, especially for prophylaxis of repeated episodes in affective disorders, has been widely studied in the past. Study by Lingam *et al*. and Sajatovic *et al*. has shown that poor adherence to treatment has been shown to range from 20% to 70%.[16,17] This is consistent with our research in which discontinuation of medication contributes to recurrence of episode in 16% of cases. Fifty-eight percent of the entire sample did not have any precipitating factor. This may be due to the presence of unreliable informant available to the patient, who may not be residing with the patient at the onset of the illness, or lack of informant's knowledge regarding risk factors and initiating stressors for affective disorders.

No significant association was found between positive family history of severe mental illness and presence of first rank symptom, which is similar to the findings of Peralta and Cuesta.[14] Physical comorbidity, predominantly cardiovascular disorders, were present in 12.9% of cases with FRS, but no significant association was identified between the two. Previous studies by Kilbourne *et al*. and Westman *et al*. have shown that cardiovascular morbidity, especially hypertension, is far more prevalent than any other general medical condition.[18,19]

The duration of illness for the current episode ranged from abrupt onset to acute onset, with minimum range from 1 week to 4 months. This large variation in the current duration of illness could be speculated to number of reasons, including the inability of patients to respond to drug trial, or nonadherence to treatment, or continuing stressors that could pose a hindrance to the treatment of the manic episode, leading to increased duration. The first episode of mania was recorded at low incidence (16.1%), with several episodes remaining in the past. Unipolar manic episodes were in maximum frequency, followed by bipolar picture in the past. This is comparable to a study by Miller *et al*., which indicates the longitudinal course of bipolar 1 disorder, where the 1st episode illness occurred at a higher incidence of 12%.[20]

Auditory hallucinations, including voices arguing (77.4%) and voices commenting on one's action (83.9%) are reported higher frequently than in previous studies. Thought echo (12.9%) was also reported more frequently than previous research.[9,14] Thought broadcasting (38.7%) was frequently reported, compared to the previous study.[9] While few research have shown a relatively low frequency of thought broadcast phenomenon.[14]

Conversely, thought insertion (3.2%) was at a lower level than reported in previous studies.[9,14] One study showed the absence of thought insertion in any of the cases, which is almost identical to the unusual event reported in our current research.[8] Thought withdrawal (12.9%) was reported at a comparatively higher frequency than in previous studies.[8,15] Nonetheless, a previous study found that thought withdrawal to be present at a significantly higher rate than reported in the current research.[9] Somatic passivity (3.2%) was reported at a lower frequency in the current study sample, which is strongly inconsistent with previous studies, ranging from 20% to 37.5%.[8,14] Made, acts (3.2%) were reported at a very low level, comparable to previous published studies.[8,14] Delusion perception (25.8%) was reported at a higher frequency, which is similar to the previous research.[14] Nevertheless, the incidence of delusional perception is reported to be low in a few previous studies.[8,9] Phenomenon of made impulses/drives and made feelings were not observed in the sample, which is somewhat comparable to the very low incidence recorded in previous studies (up to ~7%).[9,14]

The average range in YMRS in those cases with the presence of FRS ranged from 21 to 54, with a mean score of $40.16 \pm 7.91$. In the past, there has been no research comparing YMRS scores with FRS. Statistical significance was reported with the severity of mania and presence of thought withdrawal phenomenon.

Language is a critical criterion for clinical evaluation of psychiatric patients in developing countries, as the language barrier may have a major effect on the outcome. The screening technique used in our research has been validated in the Hindi version of PSE-9; Hindi being primary language of all the patients. It reduced the chance of miscommunication to a large extent. This is important because the study by Coffey *et al*. found that patients with strong command of their primary language were more likely to have FRS, because the interview did not yield any miscommunication.[21]

It has been determined that there is a difference in the occurrence of individual FRS symptoms. The overall variability in the occurrence of FRS may be due to differences in cultural traditions and beliefs. This could be in line with a study conducted in Sri Lanka that reported a higher prevalence of cultural and sub-cultural beliefs among ethnic minorities that could lead to a varying prevalence of FRS. The prevalence of certain individual FRS also differs with ethnicity and nationality as seen in a research by Chandrasena.[22] However, this current study did not discuss any cultural or sub cultural beliefs on ethnicity basis.

## Strength of the study

While numerous past studies have been conducted in the field of FRS in the Western context, there is a lack of study in the Indian sub-continent. This research was an attempt to do the same, throwing light on the FRS trend in mania in north Indian sub-population context. The research also examined the association between mania severity using YMRS scale and individual FRS for which there is scarcity of literature.

## Limitations of the study

The study was done in tertiary care psychiatry hospital, which caters the patients of various socioeconomic background. However, the sample is a hospital-based study, and is not a true representation of whole population. The sampling technique used was convenient sampling. Selection bias could be present while selecting the sample, because the subjects selected were chosen who were in acute stage of mania and were at peak of their illness. Prime interest was for selecting cases with more presence of psychotic symptoms, which could lead to increased prevalence of FRS. The study had a cross-sectional design. Recall bias can be considered while eliciting the details regarding previous episodes and precipitating factor. Sample size was small.

## CONCLUSIONS

The study confirms FRS in substantial cases of mania. FRS in mania can lead to misdiagnosis of schizophrenia, leading to inadequate management, delayed appropriate treatment, and poor prognosis.

### Conflicts of interest

There are no conflicts of interest.

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