

Safety And Efficacy Of Antipsychotics In Schizophrenic Patients Visiting A Tertiary Care Teaching Hospital In Warangal: A Comparative Study

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ABSTRACT

The objective of present study is to compare the safety and efficacy of Antipsychotics in Schizophrenic patients by using Simpson Angus Score (SAS) and Positive and Negative Syndrome Score (PANSS).

Method: It is a Prospective, observational comparative multicentric study conducted in patients diagnosed with Schizophrenia in Warangal, Telangana state. The study protocol, Data collection sheet were submitted. A total of 513 patients were screened for the study prescribed with Risperidone, Olanzapine, Amisulpride, Lurasidone, Aripiprazole.

Statistical Analysis: All the parameters were expressed as graphs and data analysis was performed using MS EXCEL and Graph pad prism 9.2.0 Version. Paired t test was computed for study variables.

Results: The results were confirmed by comparing the safety and efficacy of antipsychotics (Risperidone, Olanzapine, Amisulpride, Lurasidone, Aripiprazole) by using PANSS and SAS scale. Efficacy in reducing Positive and Negative symptoms severity was slightly high in Lurasidone and Aripiprazole than compared to Olanzapine, Risperidone, Amisulpride. Safety of Lurasidone and Aripiprazole was slightly more compared to Olanzapine, Risperidone and Amisulpride.

Keywords: Risperidone, Olanzapine, Amisulpride, Lurasidone, Aripiprazole, Schizophrenia.

1. INTRODUCTION

Schizophrenia is a Psychotic illness. Psychosis is a syndrome in which person's mental capacity, affective response, and capacity to recognize reality, communicate, and relate to others is impaired, Schizophrenia can erupt suddenly when a patient decompensates into a psychotic episode^[1]. Schizophrenia is characterized by group of symptoms. It includes Positive and Negative symptoms. According to American psychiatric association second generation antipsychotics are the agents of choice for the first line treatment of Schizophrenia^[2,3].

2. MATERIAL AND METHODS

A prospective, observational, multicentric study was conducted on 513 schizophrenia patients receiving antipsychotic treatment at MGM Hospital, Jaya Krishna Hospital, Manisha Neuropsychiatry Clinic, and Samlochana Swastik Hospital in Warangal. Ethical approval was obtained, and informed consent was collected in the patients' native language.

Efficacy was assessed using the Positive and Negative Syndrome Scale (PANSS), and safety was evaluated using the Simpson-Angus Scale (SAS). The antipsychotics studied included Risperidone, Olanzapine, Amisulpride, Lurasidone, and Aripiprazole. Statistical analysis was conducted using MS Excel and GraphPad Prism 9.2.0. Paired t-tests were applied to

compare safety and efficacy parameters between the first and second visits, with results expressed as Mean $\pm$ Standard Deviation (SD).

3. RESULTS

The total study was carried with 513 patients who were diagnosed with Schizophrenia who were on treatment with Antipsychotics. A total of 513 case files were enrolled in this prospective observational comparative multicentric study conducted in MGM Hospital, Jayakrishna Hospital, Samlochanaswastik Hospital, Manisha Neuropsychiatry Clinic, Warangal, Telangana.

4. STATISTICAL ANALYSIS

Statistical analysis was done including both 1st visit and 2nd visit. For the safety and efficacy criteria, a paired t- test was carried out for the quantitative variables.

5. SAFETY

In Schizophrenia patients Extra Pyramidal Symptoms were assessed by Simpson Angus Scale.

Table 1. Changes in SAS scale of Risperidone

S.NO	SAS Item	Visit 1 Mean $\pm$ SD	Visit 2 Mean $\pm$ SD	P Value	Mean change	SD change	Df	95% CI
1	Gait (G)	0.132 $\pm$ 0.377	0.172 $\pm$ 0.412	0.0138*	0.03974	0.1960	150	0.00221 to 0.07125
2	Arm dropping (AD)	0.158 $\pm$ 0.448	0.205 $\pm$ 0.408	0.0077**	0.04636	0.2110	150	0.01244 to 0.08028
3	Shoulder shaking (SH)	0.2516 $\pm$ 0.492	0.331 $\pm$ 0.525	0.0044***	0.07947	0.2714	150	0.03583 to 0.1231
4	Elbow rigidity (ER)	0.245 $\pm$ 0.502	0.278 $\pm$ 0.518	0.0424*	0.03311	0.1795	150	0.004245 to 0.06198
5	Wrist rigidity (WR)	0.198 $\pm$ 0.4621	0.238 $\pm$ 0.485	0.0138*	0.03974	0.1960	150	0.008221 to 0.04125
6	Head rotation (HR)	0.105 $\pm$ 0.308	0.125 $\pm$ 0.332	0.0833	0.01987	0.1400	150	-0.002646 to 0.04238
7	Glabella tap (GT)	0.092 $\pm$ 0.290	0.112 $\pm$ 0.317	0.0833	0.01987	0.1400	150	-0.002646 to 0.04238
8	Tremor (T)	0.152 $\pm$ 0.378	0.158 $\pm$ 0.384	0.5654	0.00662	0.4141	150	-0.01609 to 0.02934
9	Salivation (s)	0.139 $\pm$ 0.347	0.158 $\pm$ 0.366	0.0833	0.01987	0.1400	150	-0.002646 to 0.04238
10	Akathisia (A)	0.119 $\pm$ 0.325	0.145 $\pm$ 0.353	0.451*	0.02649	0.1611	150	0.005822 to 0.05240

Values expressed Mean $\pm$ SD. The results were analyzed by paired t-test (Graph pad prism version 9): P<0.05^x, P<0.01^{**}, P<0.001^{***}.

Table 2. Changes in SAS scale of Olanzapine

S.NO	SAS Item	Visit 1 Mean±SD	Visit 2 Mean±SD	P Value	Mean change	SD Change	Df	95% CI
1	Gait (G)	0.163±0.453	0.176±0.463	0.1580	0.01361	0.1162	146	-0.005343 to 0.03255
2	Arm dropping (AD)	0.149±0.357	0.176±0.382	0.0451*	0.02721	0.1633	146	0.0005995 to 0.05382
3	Shoulder shaking (SH)	0.217±0.414	0.238±0.427	0.0833	0.02041	0.1419	146	-0.002718 to 0.04353
4	Elbow rigidity (ER)	0.190±0.394	0.217±0.414	0.0451*	0.02721	0.1633	146	0.0005995 to 0.05382
5	Wrist rigidity (WR)	0.163±0.370	0.204±0.404	0.0138*	0.04082	0.1985	146	0.008453 to 0.07318
6	Head rotation (HR)	0.816±0.274	0.115±0.320	0.0248*	0.03401	0.1819	146	0.004365 to 0.06366
7	Glabella tap (GT)	0.081±0.274	0.170±0.376	0.0002***	0.08844	0.2849	146	0.04200 to 0.1349
8	Tremor (T)	0.102±0.303	0.163±0.370	0.0024**	0.06122	0.2406	146	0.02201 to 0.1004
9	Salivation (s)	0.068±0.252	0.197±0.399	<0.0001****	0.1293	0.3366	146	0.07438 to 0.1841
10	Akathisia (A)	0.095±0.294	0.183±0.388	0.0002***	0.08844	0.2849	146	0.04200 to 0.1349

Values expressed Mean ± SD. The results were analyzed by paired t-test (Graph pad prism version 9): P<0.05^x, P<0.01^{**}, P<0.001^{***}.

Table 3. Changes in SAS scale of Amisulpride.

S.NO	SAS Item	Visit 1 Mean±SD	Visit 2 Mean±SD	P Value	Mean change	SD change	Df	95% CI
1	Gait (G)	0.129±0.338	0.155±0.365	0.1587	0.02595	0.1601	76	-0.01036 to 0.06231

2	Arm dropping (AD)	0.092±0.291	0.142±0.352	0.0448*	0.05195	0.2234	76	0.001248 to 0.1026
3	Shoulder shaking (SH)	0.142±0.352	0.142±0.352	0.0832	0.03896	0.1948	76	-0.005247 to 0.08317
4	Elbow rigidity (ER)	0.077±0.314	0.129±0.408	0.1028	0.05195	0.2761	76	-0.01071 to 0.1146
5	Wrist rigidity (WR)	0.220±0.417	0.417±0.272	>0.9999	0.2294	0.2294	76	-0.05207 to 0.05207
6	Head rotation (HR)	0.272±0.448	0.259±0.441	0.5671	-0.0129	0.1982	76	-0.05798 to 0.03201
7	Glabella tap (GT)	0.194±0.398	0.194±0.398	>0.999	0.0001	0.2810	76	-0.06377 to 0.06377
8	Tremor (T)	0.142±0.353	0.194±0.398	0.0448	0.05195*	0.2234	76	0.001248 to 0.1026
9	Salivation (s)	0.103±0.307	0.103±0.307	0.0132	0.06987	0.2255	76	0.001532 to 0.1213
10	Akathisia (A)	0.103±0.307	0.181±0.388	0.0133	0.07792	0.2698	76	0.01668 to 0.1392

Values expressed Mean ± SD. The results were analyzed by paired t-test (Graph pad prism version 9): P<0.05X, P<0.01**, P<0.001***.

S.NO	SAS Item	Visit 1 Mean±SD	Visit 2 Mean±SD	P Value	Mean change	SD change	Df	95% CI
1	Gait (G)	0.219±0.416	0.246±0.434	0.1587	0.02740	0.1644	72	-0.01095 to 0.06575
2	Arm dropping (AD)	0.109±0.314	0.123±0.331	0.3207	0.01370	0.1170	72	-0.01361 to 0.04101
3	Shoulder shaking (SH)	0.123±0.331	0.123±0.331	>0.9999	0.000	0.5000	72	-0.1167 to 0.1167
4	Elbow rigidity (ER)	0.095±0.296	0.109±0.314	0.3207	0.01370	0.1170	72	-0.01361 to 0.041

5	Wrist rigidity (WR)	0.095±0.296	0.109±0.314	0.3207	0.01370	0.1170	72	-0.01361 to 0.04101
6	Head rotation (HR)	0.109±0.314	0.095±0.296	0.3207	-0.01370	0.1170	72	-0.01361 to 0.0101
7	Glabella tap (GT)	0.082±0.276	0.123±0.331	0.0832	0.04110	0.1999	72	-0.005541 to 0.0877
8	Tremor (T)	0.109±0.314	0.123±0.331	0.3207	0.01370	0.1170	72	-0.01361 to 0.04101
9	Salivation (s)	0.068±0.254	0.082±0.276	0.3207	0.01370	0.1170	72	-0.01361 to 0.04101
10	Akathisia (A)	0.068±0.254	0.082±0.276	0.3207	0.01370	0.1170	72	-0.01361 to 0.04101

Table 4. Changes in SAS scale of Lurasidone

Values expressed Mean ± SD. The results were analyzed by paired t-test (Graph pad prism version 9): P<0.05X, P<0.01**, P<0.001***.

Table 5. Changes in SAS scale of Aripiprazole

S.NO	SAS Item	Visit 1 Mean±SD	Visit 2 Mean±SD	P Value	Mean change	SD Change	Df	95% CI
1	Gait (G)	0.184±0.646	0.230±0.492	0.0832	0.04615	0.2115	64	-0.006241 to 0.09855
2	Arm dropping (AD)	0.153±0.404	0.215±0.450	0.0446*	0.06154	0.2685	64	0.001528 to 0.1215
3	Shoulder shaking (SH)	0.138±0.348	0.215±0.414	0.0242*	0.07692	0.2685	64	0.01038 to 0.1435
4	Elbow rigidity (ER)	0.4±0.68	0.476±0.681	0.0242*	0.07692	0.2685	64	0.01038 to 0.1435
5	Wrist rigidity (WR)	0.323±0.640	0.384±0.654	0.0446*	0.06154	0.2422	64	0.001528 to 0.1215

6	Head rotation (HR)	.230±0.552	0.246±0.559	0.3211	0.01538	0.1240	64	-0.01535 to 0.04612
7	Glabella tap (GT)	0.076±0.268	0.107±0.312	0.1589	0.03077	0.1740	64	-0.01235 to 0.07389
8	Tremor (T)	0.230±0.552	0.230±0.552	0.2567	0.01654	0.1178	64	-0.01457 to 0.06547
9	Salivation (s)	0.169±0.453	0.184±0.646	0.3211	0.01538	0.1240	64	-0.01535 to 0.04612
10	Akathisia (A)	0.353±0.597	0.338±0.593	0.3211	-0.0153	0.1240	64	-0.0412 to 0.01535

Values expressed Mean ± SD. The results were analyzed by paired t-test (Graph pad prism version 9): P<0.05X, P<0.01**, P<0.001***.

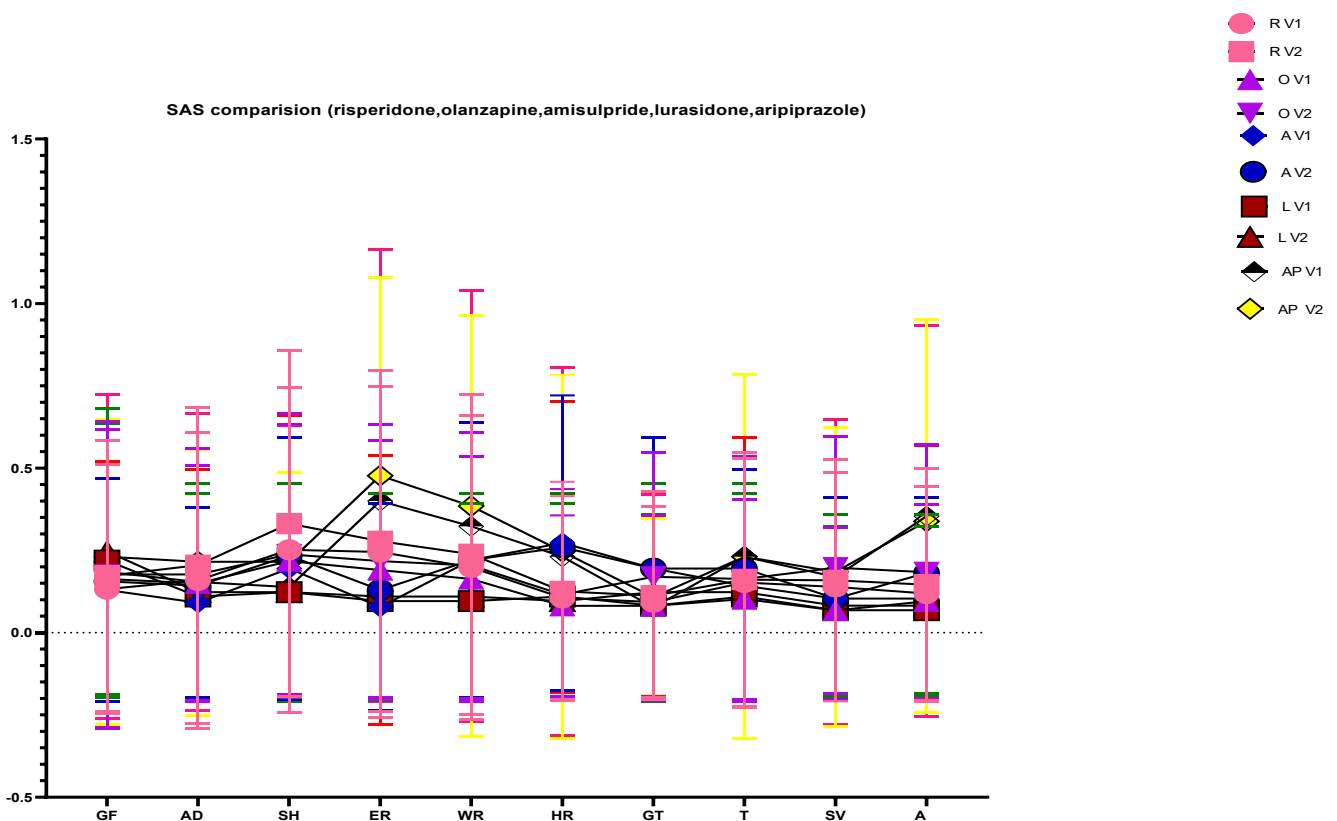


Figure 1: SAS Comparison of (Risperidone, Olanzapine, Amisulpride, Lurasidone, Aripiprazole)

SAS parameters showed a slight increase at visit 2 in the Risperidone, Olanzapine, and Amisulpride groups. In the Lurasidone group, most parameters (D, SH, ER, WR, HR, SV, A) showed a marked decrease, while GT, T, and G were mildly present. In the Aripiprazole group, only mild occurrences of G, AD, SH, ER, and WR were noted, with GT, T, SV, and AD not observed.

6. EFFICACY

The Efficacy of Schizophrenic patients was assessed by Positive and Negative Syndrome Scale which includes positive scale, negative scale, and General Psychopathological scale.

Table 6. Changes in PANSS Positive Scale of Risperidone

S.NO	PANSS Item	Visit 1 Mean±SD	Visit 2 Mean±SD	P Value	MEAN Change	SD Change	Df	95% CI
1	Delusions (DL)	3.370±0.744	1.642±0.557	<0.0001****	-1.728	0.9087	150	-1.8752 to -0.1582
2	Conceptual disorganization (CD)	3.172±0.869	2.794±0.940	<0.0001****	-0.3775	0.6903	150	-0.4885 to -0.665
3	Hallucinatory behaviour (HB)	3.629±0.536	3.046±0.827	<0.0001****	0.5828	0.7515	150	-0.7036 to -0.4619
4	Excitement (EX)	4.258±0.547	3.827±0.718	<0.0001****	-0.4305	0.7072	150	-0.5442 to -0.3167
5	Grandiosity (GR)	1.350±0.478	1.225±0.419	<0.0001****	-0.1258	0.3328	150	-0.1793 to -0.07232
6	Suspiciousness (SP)	3.966±0.495	3.562±0.638	<0.0001****	-0.4040	0.6237	150	-0.543 to -0.3037
7	Hostility (HO)	3.980±0.355	3.165±1.422	<0.0001****	-0.8146	1.122	150	-0.9950 to -0.6342

S.NO	PANSS Item	Visit 1 Mean±SD	Visit 2 Mean±SD	P Value	MEAN Change	SD Change	Df	95% CI
1	Delusions (DL)	3.204±0.681	2.401±0.718	<0.0001****	-0.6735	0.5753	146	-0.7673 to -0.5797
2	Conceptual disorganization (CD)	3.054±1.025	2.469±0.931	<0.0001****	-0.5850	0.5470	146	-0.6743 to 0.4959
3	Hallucinatory behaviour (HB)	4.088±0.766	3.646±0.842	<0.0001****	-0.4422	0.6838	146	-0.5536 to -0.3307
4	Excitement (EX)	1.605±0.490	1.510±0.501	<0.0001***	-0.0953	0.2945	146	-0.1433 to -0.04723
5	Grandiosity (GR)	2.442±0.586	2.244±0.668	<0.0001****	-0.1973	0.3993	146	-0.2624 to -0.1322
6	Suspiciousness (SP)	4.285±0.651	2.306±1.004	<0.0001****	-1.980	1.037	146	-2.149 to -1.811

7	Hostility (HO)	3.951±0.712	2.673±1.080	<0.0001****	-1.158	1.078	146	-1.333 to -0.9818
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Table 7. Changes in PANSS Positive Scale of Olanzapine

Table 8. Changes in PANSS Positive Scale of Amisulpride

S.NO	PANSS Item	Visit 1 Mean±SD	Visit 2 Mean±SD	P Value	MEAN Change	SD Change	Df	95% CI
1	Delusions (DL)	1.452±0.501	1.547±0.501	0.2889	-0.01361 to 0.04101	0.7667	72	-0.08300 to 0.2748
2	Conceptual disorganization (CD)	3.410±0.522	1.739±0.624	<0.0001****	-1.671	0.8174	72	-1.862 to -1.481
3	Hallucinatory behaviour (HB)	4.013±0.841	1.479±0.579	<0.0001****	-2.534	1.068	72	-2.783 to -2.285
4	Excitement (EX)	1.598±0.495	1.013±0.117	<0.0001****	-0.5753	0.5249	72	-0.6978 to -0.4529
5	Grandiosity (GR)	2.095±0.748	1±0	<0.0001****	-0.196	0.7484	72	-1.271 to -0.9213
6	Suspiciousness (SP)	4.178±0.839	1.698±1.794	<0.0001****	-2.479	0.8992	72	-2.689 to -2.270
7	Hostility (HO)	3.945±0.724	1.794±0.686	<0.0001****	-2.151	1.089	72	-2.405 to -1.897

S.NO	PANSS Item	Visit 1 Mean±SD	Visit 2 Mean±SD	P Value	MEAN Change	SD Change	Df	95% CI
1	Delusions (DL)	3.519±0.502	2.727±0.940	<0.0001***	-0.7922	1.092	76	-1.040 to -0.5443
2	Conceptual disorganization (CD)	3.493±0.528	2.896±0.911	<0.0001***	-0.5974	0.9633	76	-0.8160 to -0.3788
3	Hallucinatory behaviour (HB)	4.428±0.498	3.740±0.992	<0.0001****	-0.68883	1.042	76	-0.9248 to -0.4518
4	Excitement (EX)	2.207±0.521	1.883±0.794	<0.0001****	-0.3247	0.4713	76	-0.4317 to -0.2177
5	Grandiosity (GR)	2.454±0.501	0.129±0.338	0.0014**	-0.1948	0.5140	76	-0.3115 to -0.07814

6	Suspiciousness (SP)	4.337±0.640	4.051±0.886	0.0011**	-0.2857	0.7409	76	-0.4539 to -0.1176
7	Hostility (HO)	4.389±0.588	4.077±0.823	<0.0001****	-0.3117	0.6541	76	-0.4602 to -0.1632

Table 9. Changes in PANSS Positive scale of Lurasidone

Table 10. Changes in PANSS Positive scale of Aripiprazole

S.NO	PANSS Item	Visit 1 Mean±SD	Visit 2 Mean±SD	P Value	MEAN Change	SD Change	Df	95% CI
1	Delusions (DL)	3.046±0.799	1.092±0.291	<0.0001****	-1.954	0.9259	64	-2.183 to -1.724
2	Conceptual disorganization (CD)	1.6±0.632	1.384±0.490	<0.0001****	0.4000	0.6325	64	0.2433 to 0.5567
3	Hallucinatory behaviour (HB)	3.723±0.760	1.4±0.553	<0.0001****	-2.323	0.9033	64	-0.01535 to 0.04612
4	Excitement (EX)	1±0	1.015±0.124	0.3211	0.01538	0.1240	64	-0.1022 to 0.2868
5	Grandiosity (GR)	1.430±0.636	1.523±0.562	0.3461	0.09231	0.7851	64	-0.1022 to 0.2868
6	Suspiciousness (SP)	2±0.75	1.32±0.471	<0.0001****	-0.6769	0.9204	64	-0.9050 to -0.4489
7	Hostility (HO)	3.061±0.609	1.323±0.471	<0.0001****	-1.738	-1.738	64	-1.92 to -1.556

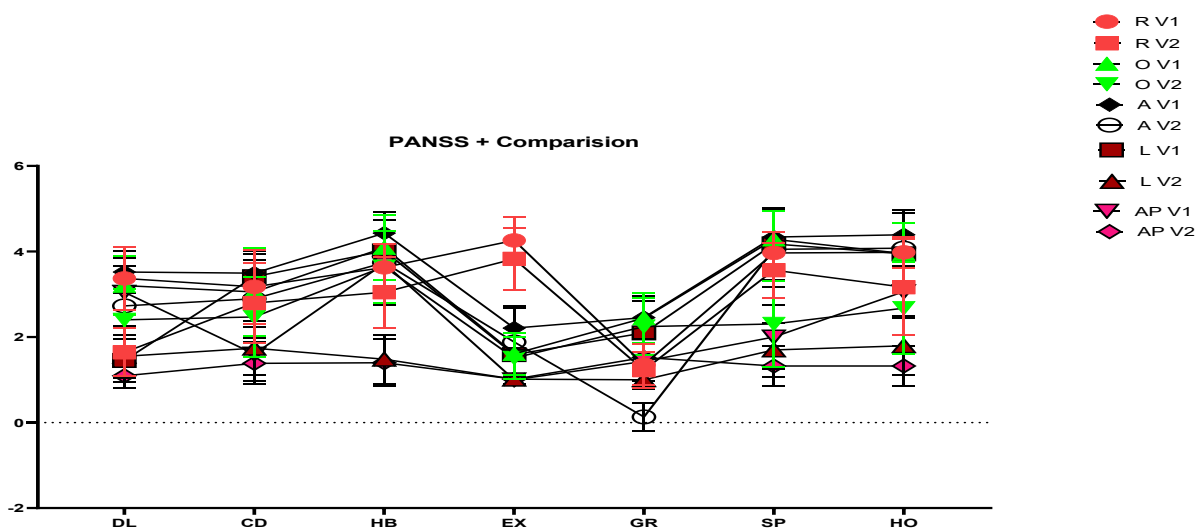


Figure 2: PANSS Positive Comparison of Risperidone, Olanzapine, Amisulpride, Lurasidone, Aripiprazole

PANSS positive symptoms decreased across all groups from visit 1 to 2. Risperidone showed significant improvement in DL, CD, HB, EX, SP, HO, and mild reduction in GR. Olanzapine showed slight decreases in most symptoms, with notable reductions in SP (-1.980) and HO (-1.158). Amisulpride showed mild improvements, except no change in EX and moderate decrease in GR. Lurasidone and Aripiprazole showed the greatest overall reduction in all positive symptoms, indicating superior efficacy.

Table 11. Changes in PANSS Negative Scale of Risperidone

S.NO	PANSS Item	Visit 1 Mean±SD	Visit 2 Mean±SD	P Value	MEAN Change	SD change	Df	95% CI
1	Blunted affect (BA)	3.807±0.618	3.456±0.780	<0.0001****	-0.3510	0.5680	150	-0.4423 to -0.2597
2	Emotional withdrawal (EW)	3.887±0.469	3.609±0.215	<0.0001****	-0.2781	0.4921	150	-0.3573 to -0.1990
3	Poor rapport (PR)	3.708±0.523	3.344±0.693	<0.0001****	-0.3642	0.5352	150	-0.4503 to -0.2782
4	Passive social withdrawal (PSW)	3.966±0.582	3.543±0.763	<0.0001****	-0.4238	0.6153	150	-0.5229 to -0.3248
5	Difficulty in abstract thinking (DAT)	2.781±0.641	2.450±0.689	<0.0001****	-0.3311	0.5624	150	-0.4216 to -0.2407
6	Lack of spontaneity and flow of conversation (LS)	3.536±0.551	3.211±0.617	<0.0001****	-0.3245	0.5106	150	-0.4066 to 0.2424
7	Stereotyped thinking (STT)	3.847±0.472	3.205±0.843	<0.0001****	-0.6424	0. 8111	150	-0.7728 to -0.5120

Table 12: Changes in PANSS Negative Scale of Olanzapine

S.NO	PANSS Item	Visit 1 Mean±SD	Visit 2 Mean±SD	P Value	MEAN Change	SD change	Df	95% CI
1	Blunted affect (BA)	3.469±0.500	2.428±0.785	<0.0001****	-1.041	0.8904	146	-1.426 to -1.074
2	Emotional withdrawal (EW)	3.836±0.712	2.659±0.815	<0.0001****	-1.177	0.91144	146	-1.327 to -1.027
3	Poor rapport (PR)	3.850±0.644	2.687±0.774	<0.0001****	-1.163	0.9934	146	-1.325 to -1.001
4	Passive social withdrawal (PSW)	3.850±0.788	2.843±0.773	<0.0001****	-1.007	0.1849	146	-1.037 to -0.9767
5	Difficulty in abstract thinking (DAT)	3.387±0.542	2.517±0.715	<0.0001****	-0.8707	0.5884	146	-1.037 to -0.9767
6	Lack of spontaneity and	3.306±0.698	2.523±0.584	<0.0001****	-0.7823	0.6876	146	-0.8944 to -0.6702

	flow of conversation (LS)							
7	Stereotyped thinking (STT)	2.156±0.709	1.857±0.721	<0.0001****	-0.2993	0.7800	146	-0.4265 to -0.1772

Table 13. Changes in PANSS negative scale of Amisulpride

S.NO	PANSS Item	Visit 1 Mean±SD	Visit 2 Mean±SD	P Value	MEAN change	SD change	Df	95% CI
1	Blunted affect (BA)	3.597±0.612	3.220±0.788	<0.0001****	-0.3766	0.678	76	-0.5146 to 0.2387
2	Emotional withdrawal (EW)	4.519±0.502	4.039±0.834	<0.0001***	-0.4805	0.5985	76	-0.6164 to -0.3447
3	Poor rapport (PR)	4.168±0.864	3.753±0.961	<0.0001****	-0.4156	0.5701	76	-0.5450 to -0.2862
4	Passive social withdrawal (PSW)	4.363±0.667	3.844±0.843	<0.0001****	-0.5195	0.5284	76	-0.6394 to -0.3995
5	Difficulty in abstract thinking	3.311±0.590	2.779±0.788	<0.0001****	-0.5325	0.5022	76	-0.6454 to -0.4185
6	Lack of spontaneity and flow of conversation (LS)	3.480±1.033	3.012±1.057	<0.0001****	-0.4675	0.5022	76	-0.5815 to -0.3535
7	Stereotyped thinking (STT)	3.441±0.499	0.742±1.870	<0.0001****	-0.5584	0.4998	76	-0.6719 to -0.4450

Table 14. Changes in PANSS negative scale of Lurasidone

S.NO	PANSS Item	Visit 1 Mean±SD	Visit 2 Mean±SD	P Value	MEAN change	SD change	Df	95% CI
1	Blunted affect (BA)	3.109±0.698	1.616±0.592	<0.0001****	-1.493	1.056	72	-1.739 to -1.247
2	Emotional withdrawal (EW)	3.726±0.449	1.410±0.495	<0.0001****	-2.315	0.6641	72	-2.470 to -2.160
3	Poor rapport (PR)	3.616±0.517	1.821±0.608	<0.0001****	-1.795	0.6446	72	-1.945 to -1.644
4	Passive social withdrawal (PSW)	3.232±0.457	1.986±0.589	<0.0001****	-1.247	0.8297	72	-1.440 to -1.053

5	Difficulty in abstract thinking (DAT)	2.452±0.553	1.753±0.434	<0.0001****	-0.6986	0.7761	72	-0.8797 to -0.5175
6	Lack of spontaneity and flow of conversation (LS)	4.369±0.486	2.342±0.477	<0.0001****	-2.027	0.7633	72	-2.205 to -1.849
7	Stereotyped thinking (STT)	3.573±0.497	1.753±0.434	<0.0001****	-1.822	0.6312	72	-1.969 to -1.675

Table 15. Changes in PANSS Negative scale of Aripiprazole

S.NO	PANSS Item	Visit 1 Mean±SD	Visit 2 Mean±SD	P Value	MEAN change	SD change	Df	95% CI
1	Blunted affect (BA)	1.861±0.807	1.892±0.868	0.8182	0.03077	1.075	64	-0.2356 to 0.2971
2	Emotional withdrawal (EW)	3.461±0.751	1.307±0.465	<0.0001****	-2.154	0.8880	64	-2.374 to -1.934
3	Poor rapport (PR)	3.276±0.800	1.292±0.458	<0.0001****	-1.985	0.9436	64	-2.374 to -1.751
4	Passive social withdrawal (PSW)	2.538±0.502	1.846±0.689	<0.0001****	-0.6923	0.9001	64	-0.9153 to -0.4693
5	Difficulty in abstract thinking (DAT)	2.061±0.726	1.692±0.465	0.0007***	-0.3692	0.8398	64	-0.5773 to -0.1611
6	Lack of spontaneity and flow of conversation (LS)	3.015±0.717	2.215±0.572	<0.0001****	-0.8000	1.003	64	-1.049 to -0.5514
7	Stereotyped thinking (STT)	2.446±0.919	1.861±0.747	0.0008***	-0.5846	1.333	64	-0.9150 to -0.2542

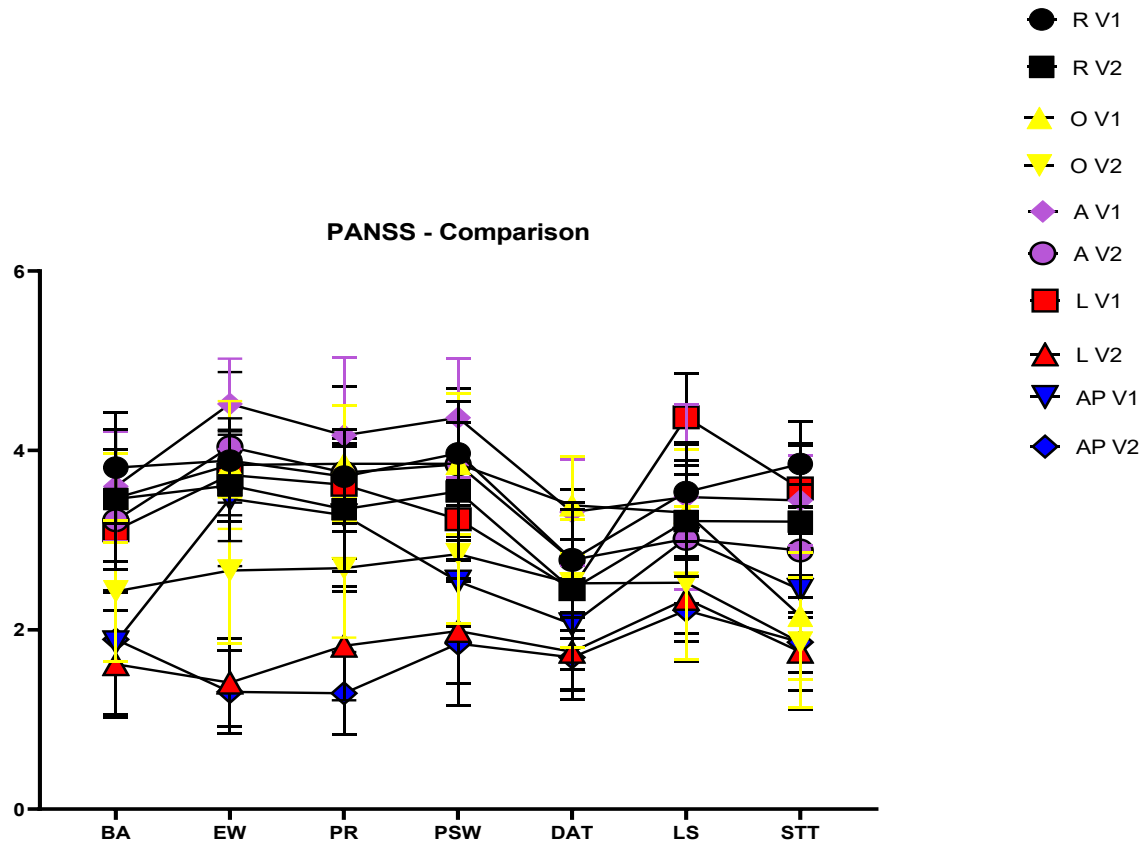


Figure 3: Comparison of PANSS Negative parameters of Risperidone, Olanzapine, Amisulpride, Lurasidone, Aripiprazole

PANSS positive symptoms decreased in all groups. Risperidone and Olanzapine showed moderate improvements, with Olanzapine notably reducing SP and HO. Amisulpride showed mild changes, with no effect on EX. Lurasidone and Aripiprazole showed the most significant overall improvement, indicating higher efficacy.

Table 16. Changes in PANSS General pathophysiologic Scale of Risperidone

S.NO	PANSS Item	Visit 1 Mean±SD	Visit 2 Mean±SD	P Value	Mean change	SD change	Df	95% CI
1	Somatic concern (SC)	2.913±0.765	2.549±0.718	<0.0001****	-0.6424	0.8111	150	-0.7728 to -0.5120
2	Anxiety (AX)	2.761±0.709	2.569±0.761	<0.0001****	-0.1921	0.4429	150	-0.2633 to -0.1208
3	Guilt feelings (GF)	0.066±0.319	1.066±0.319	0.5289	0.02649	0.5157	150	-0.05644 to 0.1094
4	Tension (T)	1.947±0.772	1.562±0.717	<0.0001****	-0.3841	0.7198	150	-0.4999 to -0.2684
5	Mannerisms and posturing (MP)	2.311±0.784	2±0.8	<0.0001****	-0.3113	0.6130	150	-0.4098 to -0.2127
6	Depression (D)	3.662±0.641	3.317±0.705	<0.0001****	-0.3444	0.5543	150	-0.4335 to 0.2552

7	Motor retardation (MR)	1.986±0.673	1.715±0.705	<0.0001****	-0.2715	0.4752	150	-0.3479 to -0.1951
8	Uncooperativeness (UP)	2.562±0.572	2.258±0.677	<0.0001****	-0.3046	0.4760	150	-0.3812 to -0.2281
9	Unusual thought content (UTC)	1.801±0.589	1.516±0.609	<0.0001****	-0.2848	0.5212	150	-0.3686 to -0.2010
10	Disorientation (DO)	1.834±0.677	1.635±0.678	<0.0001****	-0.1987	0.4167	150	-0.2657 to -0.1317
11	Poor attention (PA)	2.218±0.773	1.907±0.715	<0.0001****	-0.3113	0.5315	150	-0.3967 to -0.2258
12	Lack of judgement and insight (LJI)	2.900±0.814	2.549±0.788	<0.0001****	-0.3510	0.4926	150	-0.4302 to -0.2718
13	Disturbance of volition (DVO)	3.549±0.585	0.013±0.765	<0.0001****	-0.5364	0.5630	150	-0.6270 to -0.04452
14	Poor impulse control (PIC)	3.099±0.586	2.735±0.607	<0.0001****	-0.3642	0.4964	150	-0.4441 to -0.2844
15	Preoccupation (POC)	3.132±0.718	2.536±0.763	<0.0001****	-1.106	0.6649	150	-1.213 to -0.9991
16	Active social avoidance (AW)	3.437±0.617	2.331±0.805	<0.0001****	-0.5960	0.5559	150	-0.6854 to -0.5066

Table 17. Changes in PANSS General Psychopathological Scale of Olanzapine

S.NO	PANSS Item	Visit 1 Mean±SD	Visit 2 Mean±SD	P Value	Mean change	SD change	Df	95% CI
1	Somatic concern (SC)	1.340±0.475	1.408±0.669	0.2399	0.06803	0.6989	146	-0.0459to 0.1820
2	Anxiety (AX)	1.272±0.446	1.333±0.633	0.2937	0.06122	0.7044	146	-0.0536to 0.1761
3	Guilt feelings (GF)	1.163±0.370	1.503±0.770	<0.0001****	0.3401	0.7804	146	0.2129 to 0.4674
4	Tension (T)	3.952±0.761	2.911±0.921	<0.0001****	-1.041	0.8670	146	-1.182 to -0.6995
5	Mannerisms andposturing (MP)	1.612±0.590	1.299±0.488	<0.0001****	-0.3129	0.4653	146	-0.388 to -0.2371
6	Depression (D)	3.503±0.788	2.761±0.805	<0.0001****	-0.7415	0.4695	146	-0.8180 to -0.6650

7	Motor retardation (MR)	1.367±0.662	1.204±0.421	<0.0001****	-0.1633	0.4688	146	-0.239to -0.08685
8	Uncooperativeness (UP)	3.074±0.785	2.503±0.788	<0.0001****	-0.5714	0.5102	146	-0.6544to0.4883
9	Unusual thought content (UTC)	3.013±0.740	2.394±0.772	<0.0001****	-0.6190	0.5531	146	-0.7092 to -0.5289
10	Disorientation (DO)	2.986±0.835	2.421±0.851	<0.0001****	-0.5646	0.5111	146	-0.6379 to -0.4813
11	Poor attention (PA)	4.020±0.79	1.823±0.728	<0.0001****	-2.197	1.051	146	-2.369 to -2.026
12	Lack of judgement and insight (LJI)	2.156±0.718	1.959±0.834	0.0226*	-0.1973	1.038	146	-0.366to0.02809
13	Disturbance of volition (DVO)	3.074±0.965	2.068±0.782	<0.0001****	-1.007	1.384	146	-1.233 to 0.7807
14	Poor impulse control (PIC)	2.136±0.746	1.476±0.501	<0.0001****	-0.6599	0.9687	146	-0.8178 to -0.5020
15	Preoccupation (POC)	2.136±0.781	1.551±0.499	<0.0001****	-0.5850	0.9204	146	-0.7351 to -0.4350
16	Active social avoidance (AW)	3.897±0.737	1.551±0.525	<0.0001****	-2.347	0.9190	146	-2.497 to -2.197

Table 18. Changes in PANSS General Psychopathologic scale of Amisulpride

S.NO	PANSS Item	Visit 1 Mean±SD	Visit 2 Mean±SD	P Value	Mean change	SD change	Df	95% CI
1	Somatic concern (SC)	2.246±0.710	1.870±0.731	<0.001****	-0.3766	0.5140	76	-0.493to -0.2600
2	Anxiety (AX)	1.597±0.590	1.402±0.544	<0.001****	-0.1948	0.3986	76	-0.285to -0.1043
3	Guilt feelings (GF)	1.454±0.526	1.285±0.454	<0.001****	-0.1688	0.3771	76	-0.25to -0.08325
4	Tension (T)	4.116±0.959	3.701±0.987	<0.001****	-0.4156	0.5465	76	-0.539to -0.2915
5	Mannerisms andposturing (MP)	2.038±0.938	1.688±0.846	<0.001****	-0.3506	0.5070	76	-0.46to -0.2356
6	Depression (D)	4.285±0.603	3.818±0.806	<0.001****	-0.4675	0.5521	76	-0.592 to -0.3422

7	Motor retardation (MR)	1.987±1.175	1.792±1.067	<0.001****	- 0.1948	0.3986	76	-0.285 to -0.1043
8	Uncooperativeness (UP)	4.233±0.792	3.649±0.942	<0.001****	- 0.5844	0.5465	76	-0.708 to -0.4604
9	Unusual thought content (UTC)	2.584±0.922	2.168±0.923	<0.001****	- 0.4156	0.4961	76	-0.528 to -0.3030
10	Disorientation (DO)	2.428±0.965	2.051±0.916	<0.001****	- 0.3766	0.5370	76	-0.499 to -0.2543
11	Poor attention (PA)	2.610±0.728	2.337±0.820	<0.001****	- 0.2727	0.4767	76	-0.3809 to -0.164
12	Lack of judgement and insight (LJI)	2.246±1.349	2.039±1.281	<0.001****	- 0.2078	0.4084	76	-0.300 to -0.1151
13	Disturbance of volition (DVO)	2.740±0.441	2.350±0.623	<0.001****	- 0.3896	0.4909	76	-0.501 to -0.2782
14	Poor Impulse (PIC)	1.675±0.572	1.545±0.551	0.0012**	- 0.1299	0.3384	76	-0.20to -0.05307
15	Preoccupation (POC)	2.051±0.686	1.844±0.650	<0.001****	- 0.2078	0.4084	76	-0.300 to -0.1151
16	Active social avoidance (AW)	2.454±0.501	2.129±0.655	<0.001****	- 0.3247	0.4713	76	-0.431 to -0.2177

Table 19. Changes in PANSS General Psychopathologic scale of Lurasidone

S.NO	PANSS Item	Visit 1 Mean±SD	Visit 2 Mean±SD	P Value	Mean change	SD change	Df	95% CI
1	Somatic concern (SC)	1.547±0.501	1±0	<0.0001****	- 0.5479	0.5011	72	-0.6649 to - 0.4310
2	Anxiety (AX)	4.427±0.643	1.369±0.486	<0.0001****	-3.055	0.1146	72	-3.245 to -2.865
3	Guilt feelings (GF)	1.630±0.486	1±0	<0.0001****	- 0.6301	0.4861	72	-0.7436 to - 0.5167
4	Tension (T)	4.534±0.554	1.493±0.669	<0.0001****	-3.041	0.9922	72	-3.273 to -2.810
5	Mannerisms andposturing (MP)	1.684±0.467	1.246±0.434	<0.0001****	- 0.4384	0.5524	72	-0.5672 to - o.3095
6	Depression (D)	4.726±0.479	1.520±0.503	<0.0001****	-3.205	0.0221	72	-3.351 to -3.060
7	Motor retardation (MR)	2.573±0.497	1.328±0.473	<0.0001****	-1.247	0.6827	72	-1.406 to -1.087
8	Uncooperativeness (UP)	3.917±4.331	1.2190.416±	<0.0001****	-2.699	0.6601	72	-2.853 to -2.545
9	Unusual thought content (UTC)	3.219±0.768	1.561±0.499	<0.0001****	-1.658	0.9891	72	-1.888 to -1.427

10	Disorientation (DPO)	2.506±0.503	1.301±0.462	<0.0001****	-1.205	0.6864	72	-1.366 to -1.04
11	Poor attention (PA)	4.452±0.528	2.054±0.761	<0.0001****	-2.397	0.9964	72	-2.366 to -1.990
12	Lack of judgement and insight (LJI)	3.616±0.543	1.438±0.600	<0.0001****	-2.178	0.8052	72	-2.232 to -1.933
13	Disturbance of volition (DVO)	3.328±0.473	1.246±0.434	<0.0001****	-2.082	0.6402	72	-2.2130 to -2.787
14	Poor Impulse (PIC)	3.219±0.558	1.26±0.441	<0.0001****	-2.089	0.7122	72	-2.987 to -2.589
15	Preoccupation (POC)	4.493±0.580	1.630±0.677	<0.0001****	-1.959	0.7348	72	-3.059 to -2.667
16	Active social avoidance (AW)	3.780±0.731	1.273±0.449	<0.0001****	-2.863	0.8386	72	-2.553 to -2.132

Table 20. Changes in PANSS General Psychopathologic scale of Aripiprazole

S.NO	PANSS Item	Visit 1 Mean±SD	Visit 2 Mean±SD	P Value	Mean change	SD change	Df	95% CI
1	Somatic concern (SC)	1±0	1±0	<0.0001****	-0.4356	0.6543	64	-1.078 to -0.3456
2	Anxiety (AX)	1.846±0.618	1.292±0.458	<0.0001****	-0.5538	0.8107	64	-1.049 to -0.2542
3	Guilt feelings (GF)	1.10±0.312	1.015±0.124	0.0328*	-0.0923	0.3411	64	-0.768 to -0.0077
4	Tension (T)	3.153±0.775	1.615±0.743	<0.0001****	-1.538	0.1032	64	-1.794 to -1.283
5	Mannerisms and posturing (MP)	1±0	1±0	<0.0001****	-1.435	0.4765	64	-1.546 to -1.345
6	Depression (D)	2.492±0.503	1.492±0.503	<0.0001****	-1.000	0.7071	64	-1.170 to -0.8248
7	Motor retardation (MR)	1.123±0.331	1±0	<0.0001****	0.4308	0.6116	64	0.279 to 0.5823
8	Uncooperativeness (UP)	1.707±0.578	1.415±0.496	<0.0001****	-0.2923	0.8047	64	-0.4917 to -0.5823
9	Unusual thought content (UTC)	1.923±0.644	1.538±0.614	<0.0001****	-0.3846	1.026	64	-0.6389 to -0.1304
10	Disorientation (DO)	2.492±0.615	1.415±0.583	<0.0001****	-1.077	0.9238	64	-1.306 to -0.8480
11	Poor attention (PA)	2.938±0.826	2±0	<0.0001****	-0.9385	0.8268	64	-1.143 to -0.7336
12	Lack of judgement and insight (LJI)	2.6±0.724	1.769±0.424	<0.0001****	-0.8308	0.7820	64	-1.025 to -0.6370

13	Disturbance of volition (DVO)	3.415±0.864	1.584±0.609	<0.0001****	-1.831	1.039	64	-2.088 to -1.573
15	Preoccupation (POC)	2.184±0.704	1.692±0.465	<0.0001****	-0.4923	0.8682	64	0.7074 to -0.2712
16	Active social avoidance (AW)	2.784±0.649	2±0	<0.0001****	-0.7846	0.6493	64	-0.9455 to -0.6237

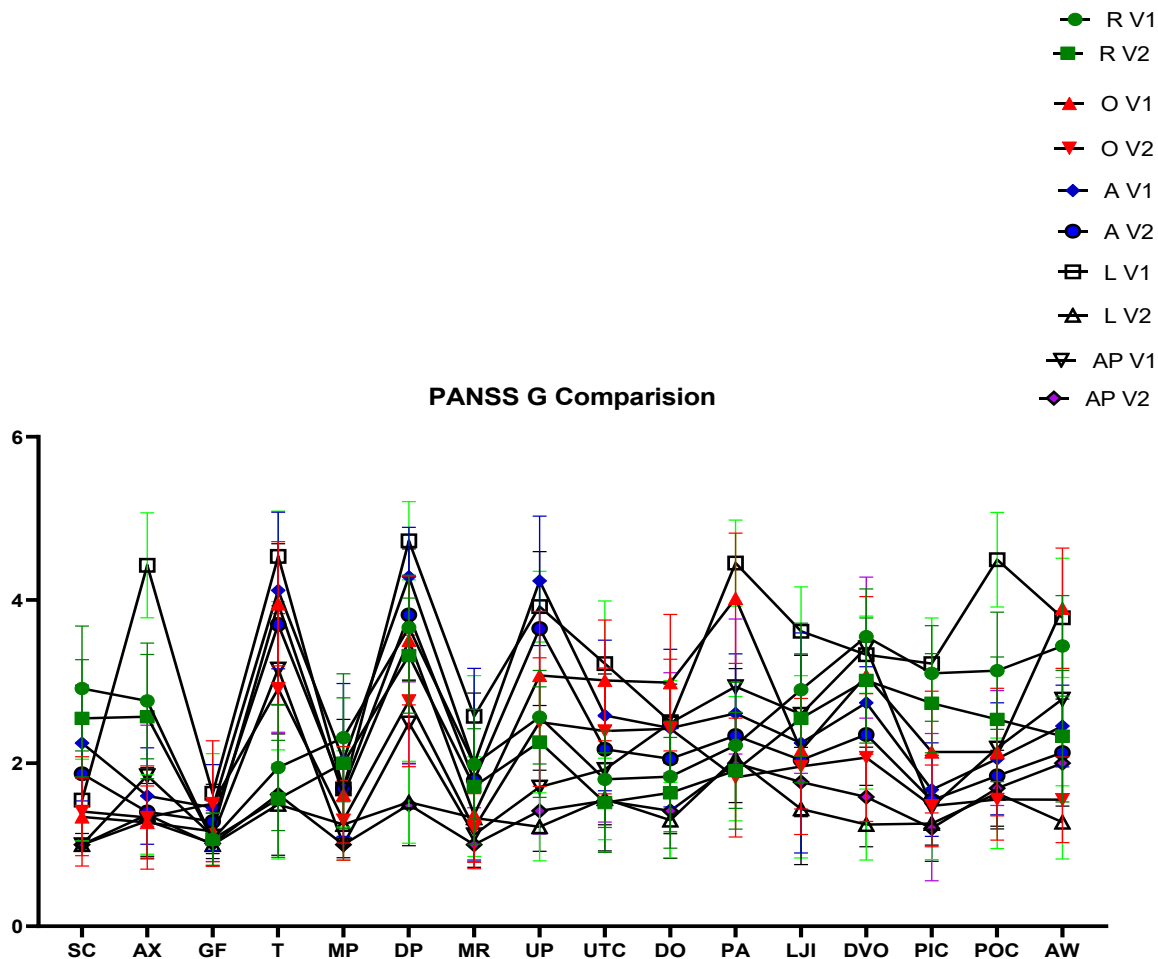


Figure 4: Comparison of PANSS General psychopathologic parameters in Risperidone, Olanzapine, Amisulpride, Lurasidone and Aripiprazole.

PANSS general psychopathology symptoms showed mild to moderate reductions with Risperidone, Olanzapine, and Amisulpride, with Olanzapine showing no change in SC and AX. Lurasidone and Aripiprazole showed significant overall improvement, indicating superior efficacy in reducing general psychopathology symptoms by visit 2.

7. DISCUSSION

This study compared the Safety and Efficacy of five Antipsychotics—Risperidone, Olanzapine, Amisulpride, Lurasidone, and Aripiprazole in 513 schizophrenia patients. Safety was assessed using the Simpson Angus Scale (SAS), and efficacy using the Positive and Negative Syndrome Scale (PANSS). Among safety outcomes, extrapyramidal symptoms (EPS) such as gait issues, rigidity, and akathisia were more frequently observed in Risperidone, Olanzapine, and Amisulpride groups, whereas Lurasidone and Aripiprazole reported fewer and milder EPS.

In terms of efficacy for positive symptoms, Aripiprazole and Lurasidone showed greater reduction, particularly in delusions, hallucinations, and hostility, compared to the other three drugs. Olanzapine showed moderate improvement, while Risperidone and Amisulpride demonstrated mild to moderate efficacy. For negative symptoms, Lurasidone and Aripiprazole

again showed higher symptom reduction, whereas Olanzapine showed moderate improvement, and Risperidone and Amisulpride showed mild effects.

General Psychopathology symptoms were significantly improved with Lurasidone and moderately improved with Aripiprazole. Risperidone, Olanzapine, and Amisulpride showed only mild improvements in most parameters.

Supporting literature aligns with these findings: Lurasidone and Aripiprazole were consistently reported as effective and well-tolerated. Previous studies (e.g., Higuchi et al., Citrome et al., Meltzer et al.) support the superior efficacy and safety profile of Lurasidone. Aripiprazole has also been found effective in reducing both positive and negative symptoms with fewer side effects, as noted by Potkin et al. and Jindal et al.^(5,6,7,8,9).

8. CONCLUSION

In conclusion, the data obtained from the current study suggests that all the Antipsychotics (Risperidone, Olanzapine, Amisulpride, Lurasidone, Aripiprazole) were effective in treating the symptom severity of schizophrenia and they can induce extrapyramidal symptoms, but their extent of inducing extrapyramidal symptoms varies from moderate to mild for Risperidone, Olanzapine, Amisulpride, and very mild for Lurasidone and Aripiprazole. The results were confirmed by comparing the safety and efficacy of Antipsychotics (Risperidone, Olanzapine, Amisulpride, Lurasidone, Aripiprazole) by using PANSS and SAS scale. Efficacy in reducing Positive and Negative symptoms severity was slightly high in Lurasidone and Aripiprazole than compared to Olanzapine, Risperidone, Amisulpride. Safety of Lurasidone and Aripiprazole was slightly more compared to Olanzapine, Risperidone and Amisulpride.

REFERENCES

- [1] Stephen Stahl M. Stahl's Essential Psychopharmacology: Neurospecific Basis and Practical Application. 4th ed. New York: Cambridge University Press; 2013. 80-120.
- [2] Ahuja N. A short textbook of psychiatry. 7th ed. New Delhi, India: Jaypee Brothers Medical; 2010. 55-65.
- [3] Anthony Lehman F, Chair Jeffrey Lieberman A, Lisa Dixon B, Thomas McGlashan V, Alexander Miller L, Diana Perkins O, Julie Kreyenbuhl. Practice Guidelines for the Treatment of patients with Schizophrenia. 2nd ed. 2004. 9-40.
- [4] Cheng Z, Yuan Y, Han X, Yang L, Cai S, Yang F et al. An open-label comparison of aripiprazole, olanzapine and risperidone for the acute treatment of first-episode schizophrenia: Eight week outcomes of Psychopharmacology. 2019; 33(10): 1227-1236.
- [5] Higuchi T, Ishigooka J, Iyo M, Hagi K. Safety and effectiveness of lurasidone for the treatment of schizophrenia: Results of a 26-week open-label extension study. Asia Pacific Psychiatry. 2019; 12(1).
- [6] Jindal K, Singh G, Munjal V. Aripiprazole versus olanzapine in the treatment of schizophrenia: A clinical study from India. International Journal of Psychiatry in Clinical Practice. 2012; 17(1): 21-29.
- [7] Citrome L, Weiden P, McEvoy J, Correll C, Cucchiaro J, Hsu J et al. Effectiveness of lurasidone in schizophrenia or schizoaffective patients switched from other antipsychotics: a 6-month, open-label, extension study. CNS Spectrums. 2013; 19(4): 330-339.
- [8] Meltzer H, Cucchiaro J, Silva R, Ogasa M, Phillips D, Xu J et al. Lurasidone in the Treatment of Schizophrenia: A Randomized, Double-Blind, Placebo- and Olanzapine-Controlled Study. American Journal of Psychiatry. 2011; 168(9): 957-967.
- [9] Potkin S, Saha A, Kujawa M, Carson W, Ali M, Stock E et al. Aripiprazole, an Antipsychotic with a Novel Mechanism of Action, and Risperidone vs Placebo in Patients with Schizophrenia and Schizoaffective Disorder. Archives of General Psychiatry. 2003; 60(7): 681.