Research Paper

Impact of Pharmacotherapy on Sexual Function of Persons with Schizophrenia

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ABSTRACT

Schizophrenia is one among the most serious mental illnesses. Sexual dysfunction is commonly found associated with schizophrenia. Few studies have tried to identify the factors contributing to this issue. Pharmacotherapy for schizophrenia has an impact on sexual function of patients with schizophrenia. However, this is an area which is less explored. The current study tries to find out the impact of pharmacotherapy on sexual function of persons with schizophrenia in both positive symptoms subtype and negative symptoms subtype, before, after one month and after three months of pharmacotherapy. Quantitative approach with experimental design was selected to conduct the current study. The participants comprised of 60 male patients, 36 of them with positive symptoms subtype and 24 with negative symptoms subtype were selected through purposive sampling. Data were collected by administering Personal data sheet, Structured Clinical Interview for DSM – IV, Axis I disorder - SCID, Structured Clinical Interview – Positive and Negative Syndrome Scale (SCI – PANNS) and Brief Sexual Function Inventory (BSFI). The tools were administered to the same patients during first visit, after one month and after three months visits. Collected data were analysed using SPSS. The result reveal that there is significant difference in sexual functions before pharmacotherapy, after one month and after three months of pharmacotherapy in patients with both positive and negative symptoms of Schizophrenia.

Keywords: *Sexual Function, Schizophrenia, Pharmacotherapy*

Sexual function is not only an innate biological mechanism but it also has a profound influence on human history, culture and society. As in all higher order beings, it is the basis of survival of humankind. The mental illness schizophrenia which is considered to be the most serious psychiatric condition is known to affect the sexual function as well.

A study from Ethiopia by Fanta et al. (2018) among 422 patients with schizophrenia revealed that the prevalence of sexual dysfunction is high (82.7%), which needs special attention. Normal dynamic sexual functioning is one among the faculties that is affected by the onslaught of schizophrenia. A study by Ghadirian, Chouinard, & Annable (1982)

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reported sexual dysfunction in 50% of patients having schizophrenia treated with antipsychotic medications. Schizophrenia is a psychiatric condition, which is known to cause sexual dysfunction, due to both psychopathologies as well as due to the side effect of antipsychotics used for treatment. Sexual dysfunction which is commonly found among the schizophrenics, not only affects the patients, but also their spouses' sexual needs and in turn, the entire family system. Despite this being the reality, may be due to the stigma associated and to the distorted perceptions regarding sexuality in our country, many a time in clinical practice the domain of sexual function is left unaddressed to a great extent by the patients, their spouse and the treating clinician alike. Hence, the topic for the study is of high relevance in creating an insight into such important area, which is kept into the periphery of clinical practice.

The concern of the present study is to find out whether pharmacotherapy as its side effect deteriorate the sexual function of persons with schizophrenia, or whether, sexual function, also improves with pharmacotherapy, along with other symptoms of schizophrenia? These questions are significant because a probe to delineate this aspect would yield a result that will be clinically significant and will benefit the clinicians as well as the patients. Literature reviewed so far in general also has revealed that there is a dearth of well-documented studies in this specific topic, in our country. Hence, there is a pressing need for the present study. The current study focuses on the impact of pharmacotherapy on sexual function of persons with positive and negative symptoms subtypes of schizophrenia before, after one month and after three months of pharmacotherapy.

MATERIALS AND METHODS

Quantitative approach with experimental design was selected to conduct the current study. The participants comprised of 60 male patients with Schizophrenia the age group of 25 years to 49 years selected through purposive sampling technique. The data collection instruments were Personal data sheet, Structured Clinical Interview for DSM – IV, Axis I disorder - SCID, Structured Clinical Interview – Positive and Negative Syndrome Scale (SCI – PANNS) and Brief Sexual Function Inventory (BSFI). The data collected during the first visit after one month and three months. The scored data were coded and subjected to statistical analysis using SPSS.

Data collection instruments
1. **Personal Data Sheet:** Personal data sheet was developed by the investigator, the items in the Personal data sheet were related to Age, Address, Education, Religion, Domicile, Occupation, Income, Illness details including past history/family historyand duration of Mental Illness, history of other Medical Illnesses and treatment details including Anti-psychotic Medicines used, their dosages and strength.
2. **Structured Clinical Interview for DSM – IV, Axis I disorders, (SCID):** SCID, a multi modular scale, developed by Michael B Fist, Robert L Spitzer, Gibbon M & Williams JBW (First et al., 1997) of the Biometric Research Dept., New York State Psychiatric Institute is the most widely and authentically used clinical research diagnostic tool in the diagnosis of psychiatric illnesses, which is compatible for both DSM- IV and DSM III– TR. The reliability of the tool was 0.85 through Chronbach's Alpha
3. **Structured Clinical Interview – Positive and Negative Syndrome Scale (SCI – PANNS):** The PANSS is a 30-item rating scale developed by Stanley R. Kay, Abraham Fiszbein, and Lewis A. Opler(Lewis A et al., 1992)specifically to assess

patients with schizophrenia. There is seven possible rating points, representing increasing levels of psychopathology severity (1 = absent; 2 = minimal; 3 = mild; 4 = moderate; 5 = moderate-severe; 6 = severe; 7 = extreme). The PANSS is scored by summation of ratings across items, thus the potential ranges are 7–49 for the Positive and Negative Scales and 16–112 for the General Psychopathology Scale. The Chronbach's Alpha tool reliability value was 0.95

4. **The Brief Sexual Function Inventory:** Developed by O'Leary MP, Fowler FJ, Lender king WR, Barber B, Sagnier PP, Guess HA, Barry MJ (O'Leary et al., 1995), the Brief Sexual Function Inventory is used for measuring male sexual function in practice and research. The instrument covers sexual drive (two items), erection (three items), ejaculation (two items), perceptions of problems in each area (three items) and overall satisfaction (one item). The reliability of the tool was 0.89 through Chronbach's Alpha.

Procedure

After obtaining permission from the ethics committee, hospital authorities and consent from the participants and spouses, hospitalised male patients with schizophrenia who were in the age group of 25 to 49 years, married, living with their spouses and leading an active sexual life and met the inclusion criteria were selected for the study. The diagnostic tool, Structured Clinical Interview for DSM – IV, Axis I disorder; (SCID) was administered to confirm the diagnosis. All the tools (Positive and Negative Syndrome Scale (PANSS) and Brief Sexual Function Inventory (BSFI) were administered to the patients, during the first visit before starting pharmacotherapy. After collection of baseline data during the first visit, patients were followed after one month and three months. The scored data were coded and subjected to statistical analysis.

RESULTS

The participants comprised of 60 male patients with Schizophrenia who were admitted in psychiatry hospitals in Kozhikode. 36 of them were positive symptoms subtype and 24 were negative symptoms subtype.

K S and Shapiro – Wilk test was carried out to identify the normality of distribution of data, Table.1. Since the data is non normal, non-parametric methods were used for further analysis. Kruskal-Wallis test was carried out and significant difference was found in the sexual function of patients with positive symptom schizophrenia in the visit before starting anti psychotics (visit 1), first month after anti-psychotic medication (visit 2) and third month after anti psychotics (visit 3). Post hoc analysis (Mann-Whitney U) was done to find out which among the visits the patients differ significantly. Significant difference was found between visit 1 and visit 2, visit 2 and visit 3 and visit 1 and visit 3 in all the five components of sexual function. Similarly, significant difference was found in Kruskal-Wallis test and the Mann-Whitney U test in the negative symptom subtype as well. The mean values of all the domains of sexual function in both positive and negative symptom subtypes of schizophrenia shows improvements from visit 1 to visit 2 to visit 3. . Similar findings were obtained in the clinical improvement of patients with schizophrenia in both the positive symptom and negative symptom subtype as well.

Table No.1 Values obtained in K S and Shapiro – Wilk test

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Positive Negative symptoms of Schizophrenia						
PANSS Positive	.180	180	<0.001	.882	180	<0.001
PANSS Negative	.314	180	<0.001	.699	180	<0.001
PANSS General	.131	180	<0.001	.921	180	<0.001
PANSS Composite	.119	180	<0.001	.960	180	<0.001
PANSS Anergia	.303	180	<0.001	.743	180	<0.001
PANSS Thought Disturbance	.175	180	<0.001	.907	180	<0.001
PANSS Activation	.225	180	<0.001	.809	180	<0.001
PANSS Paranoid/Belligerence	.218	180	<0.001	.862	180	<0.001
PANSS Depression	.247	180	<0.001	.785	180	<0.001
PANSS Supplemental	.180	180	<0.001	.840	180	<0.001
Sexual Functions						
Sexual Drive	.135	180	<0.001	.954	180	<0.001
Erections	.125	180	<0.001	.951	180	<0.001
Ejaculation	.175	180	<0.001	.914	180	<0.001
Problem Assessment	.143	180	<0.001	.934	180	<0.001
Overall satisfaction	.186	180	<0.001	.902	180	<0.001

Table No. 2 Means*, Standard Deviations and Chi Square values obtained for the three visits in Sexual function of patients with Positive Symptoms of Schizophrenia*

Variable	Visit	N	Mean	Standard deviation	Chi-Square	df	p value
Sexual drive	Visit 1	36	4.06	2.01	18.732	2	<0.001
	Visit 2	36	4.81	1.77			
	Visit 3	36	6.14	1.51			
Erections	Visit 1	36	6.11	2.73	18.814	2	<0.001
	Visit 2	36	7.44	2.58			
	Visit 3	36	8.92	2.44			
Ejaculation	Visit 1	36	4.72	2.39	10.664	2	0.005
	Visit 2	36	5.50	2.17			
	Visit 3	36	6.14	1.90			
Problem Assessment	Visit 1	36	6.33	3.49	18.646	2	<0.001
	Visit 2	36	8.14	3.16			
	Visit 3	36	9.44	2.89			
Overall satisfaction	Visit 1	36	23.28	11.35	19.282	2.000	<0.001
	Visit 2	36	28.61	10.38			
	Visit 3	36	33.97	9.13			

Table No.3 *p values obtained for the three consecutive visits in Sexual function of patients with Positive Symptoms of Schizophrenia*

Dependent Variable	Visits	Mann-Whitney U	Z	p value
Sexual drive	Visit 1-Visit 2	509.0	-1.596	0.111
	Visit 1-Visit 3	293.0	-4.047	<0.001
	Visit 2-Visit 3	383.0	-3.028	0.002
Erections	Visit 1-Visit 2	442.0	-2.349	0.019
	Visit 1-Visit 3	297.0	-3.975	<0.001
	Visit 2-Visit 3	412.0	-2.682	0.007

Dependent Variable	Visits	Mann-Whitney U	Z	p value
Ejaculation	Visit 1-Visit 2	472.0	-2.019	0.044
	Visit 1-Visit 3	375.0	-3.134	0.002
	Visit 2-Visit 3	525.0	-1.439	0.150
Problem Assessment	Visit 1-Visit 2	426.0	-2.516	0.012
	Visit 1-Visit 3	303.0	-3.930	<0.001
	Visit 2-Visit 3	422.0	-2.602	0.009
Overall satisfaction	Visit 1-Visit 2	428.0	-2.481	<0.001
	Visit 1-Visit 3	299.0	-3.937	<0.001
	Visit 2-Visit 3	401.0	-2.787	0.005

Table No.4 Means, Standard Deviations and Chi Square values obtained for the three visits in Sexual function of patients with negative Symptoms of Schizophrenia

Variable	Visit	N	Mean	Standard deviation	Chi-Square	df	p value
Sexual Drive	Visit 1	24	2.17	1.09			
	Visit 2	24	3.42	1.21	27.006	2	<0.001
	Visit 3	24	4.42	1.28			
Erections	Visit 1	24	2.67	1.52			
	Visit 2	24	4.67	1.79	37.127	2	<0.001
	Visit 3	24	6.25	1.96			
Ejaculation	Visit 1	24	3.00	1.56			
	Visit 2	24	4.08	1.47	10.994	2	0.004
	Visit 3	24	4.75	1.67			
Problem Assessment	Visit 1	24	6.17	3.25			
	Visit 2	24	6.00	1.56	0.741	2	0.690
	Visit 3	24	6.33	2.01			
Overall satisfaction	Visit 1	24	15.33	3.94			
	Visit 2	24	19.83	5.02	26.803	2	<0.001
	Visit 3	24	24.00	6.80			

Table No.5 *p values obtained for the three visits in Sexual function of Patients with Negative symptoms of schizophrenia*

Dependent Variable	Visits	Mann-Whitney U	Z	p value
Sexual Drive	Visit 1-Visit 2	136.0	-3.252	0.001
	Visit 1-Visit 3	58.0	-4.824	<0.001
	Visit 2-Visit 3	166.0	-2.608	0.009
Erections	Visit 1-Visit 2	102.0	-4.117	<0.001
	Visit 1-Visit 3	22.0	-5.623	<0.001
	Visit 2-Visit 3	150.0	-2.915	0.004
Ejaculation	Visit 1-Visit 2	196.0	-1.963	0.050
	Visit 1-Visit 3	134.0	-3.247	0.001
	Visit 2-Visit 3	220.0	-1.430	0.153
Problem Assessment	Visit 1-Visit 2	262.0	-0.544	0.587
	Visit 1-Visit 3	248.0	-0.833	0.405
	Visit 2-Visit 3	272.0	-0.336	0.737
Overall satisfaction	Visit 1-Visit 2	102.0	-3.860	<0.001
	Visit 1-Visit 3	70.0	-4.513	<0.001
	Visit 2-Visit 3	172.0	-2.405	0.016

Table No.6 *Means, Standard deviations and p values obtained for the three consecutive visits of Positive Symptom Schizophrenia Patients in Clinical improvement.*

Variable	Visit	N	Mean	Standard deviation	Chi-Square	df	P value
Positive	Visit 1	36	20.89	2.08	96.003	2	<0.001
	Visit 2	36	13.97	1.16			
	Visit 3	36	9.39	0.77			
General	Visit 1	36	34.39	3.89	94.887	2	<0.001
	Visit 2	36	24.11	1.95			
	Visit 3	36	18.58	0.87			
Composite	Visit 1	36	13.75	2.25	95.862	2	<0.001
	Visit 2	36	6.97	1.16			
	Visit 3	36	2.39	0.77			
Anergia	Visit 1	36	4.97	0.29	97.920	2	<0.001
	Visit 2	36	4.00	0.00			
	Visit 3	36	4.00	0.00			
Thought Disturbance	Visit 1	36	10.19	1.91	76.294	2	<0.001
	Visit 2	36	7.22	1.07			
	Visit 3	36	5.64	0.80			
Activation	Visit 1	36	5.89	1.35	72.073	2	<0.001
	Visit 2	36	4.17	0.74			
	Visit 3	36	3.14	0.42			
Paranoid/ Belligerence	Visit 1	36	9.83	1.03	93.899	2	<0.001
	Visit 2	36	6.31	0.92			
	Visit 3	36	3.67	0.48			
Depression	Visit 1	36	6.28	1.97	32.838	2	<0.001
	Visit 2	36	5.17	1.30			
	Visit 3	36	4.22	0.42			
Supplemental	Visit 1	36	13.72	1.68	97.208	2	<0.001
	Visit 2	36	9.11	0.89			
	Visit 3	36	6.14	0.35			

Table No.7 *p values obtained for the three consecutive visits of Positive Symptom Schizophrenia patients in Clinical improvement.*

Dependent Variable	Visits	Mann-Whitney U	Z	p value
Positive	Visit 1-Visit 2	0.0	-7.345	<0.001
	Visit 1-Visit 3	0.0	-7.382	<0.001
	Visit 2-Visit 3	0.0	-7.382	<0.002
General	Visit 1-Visit 2	11.0	-7.219	<0.001
	Visit 1-Visit 3	0.0	-7.377	<0.001
	Visit 2-Visit 3	4.0	-7.345	<0.001
Composite	Visit 1-Visit 2	2.0	-7.323	<0.001
	Visit 1-Visit 3	0.0	-7.382	<0.001
	Visit 2-Visit 3	0.0	-7.398	<0.001
Anergia	Visit 1-Visit 2	36.0	-7.923	<0.001
	Visit 1-Visit 3	36.0	-7.923	<0.001
	Visit 2-Visit 3	20.00	-5.261	<0.001
Thought Disturbance	Visit 1-Visit 2	119.5	-6.024	<0.001
	Visit 1-Visit 3	8.0	-7.296	<0.001
	Visit 2-Visit 3	172.0	-5.608	<0.001
Activation	Visit 1-Visit 2	191.0	-5.321	<0.001
	Visit 1-Visit 3	20.0	-7.437	<0.001

Dependent Variable	Visits	Mann-Whitney U	Z	p value
	Visit 2-Visit 3	186.5	-5.756	<0.001
Paranoid/ Belligerence	Visit 1-Visit 2	19.0	-7.238	<0.001
	Visit 1-Visit 3	0.0	-7.504	<0.001
	Visit 2-Visit 3	36.0	-7.187	<0.001
Depression	Visit 1-Visit 2	411.0	-2.750	0.006
	Visit 1-Visit 3	200.0	-5.427	<0.001
	Visit 2-Visit 3	354.0	-3.764	<0.001
Supplemental	Visit 1-Visit 2	16.0	-7.237	<0.001
	Visit 1-Visit 3	0.0	-7.646	<0.001
	Visit 2-Visit 3	0.0	-7.706	<0.001

Table No.8 *Means, Standard deviations and p values obtained for the three consecutive visits of Negative Symptom Schizophrenia Patients in Clinical improvement.*

Variable	Visit	N	Mean	Standard deviation	Chi-Square	df	p value
Negative	Visit 1	24	26.67	2.01	62.522	2	<0.001
	Visit 2	24	18.21	2.26			
	Visit 3	24	11.33	1.86			
General	Visit 1	24	37.13	3.89	61.902	2	<0.001
	Visit 2	24	26.67	3.06			
	Visit 3	24	19.38	1.79			
Composite	Visit 1	24	-15.13	3.27	57.159	2	<0.001
	Visit 2	24	-8.83	2.53			
	Visit 3	24	-3.33	1.83			
Anergia	Visit 1	24	13.08	1.14	61.043	2	<0.001
	Visit 2	24	8.83	1.24			
	Visit 3	24	6.17	1.01			
Thought Disturbance	Visit 1	24	7.13	1.83	28.639	2	<0.001
	Visit 2	24	5.83	1.09			
	Visit 3	24	4.63	0.71			
Activation	Visit 1	24	4.75	1.33	35.681	2	<0.001
	Visit 2	24	3.83	0.70			
	Visit 3	24	3.00	0.00			
Paranoid/ Belligerence	Visit 1	24	5.50	1.02	46.509	2	<0.001
	Visit 2	24	3.88	0.85			
	Visit 3	24	3.08	0.28			
Depression	Visit 1	24	7.08	1.79	44.486	2	<0.001
	Visit 2	24	5.25	0.94			
	Visit 3	24	4.00	0.00			
Supplemental	Visit 1	24	8.83	1.20	52.116	2	<0.001
	Visit 2	24	7.17	0.92			
	Visit 3	24	6.00	0.00			

Table No.9 p values obtained in clinical improvement for the three consecutive visits in Clinical improvement of Negative Symptom Schizophrenia Patients

Dependent Variable	Visits	Mann-Whitney U	Z	p value
Negative	Visit 1-Visit 2	9.0	-5.802	<0.001
	Visit 1-Visit 3	0.0	-5.978	<0.001
	Visit 2-Visit 3	0.0	-5.967	<0.001
General	Visit 1-Visit 2	4.0	-5.870	<0.001

Dependent Variable	Visits	Mann-Whitney U	Z	p value
	Visit 1-Visit 3	0.0	-5.961	<0.001
	Visit 2-Visit 3	9.0	-5.776	<0.001
Composite	Visit 1-Visit 2	48.0	-4.996	<0.001
	Visit 1-Visit 3	0.0	-5.968	<0.001
	Visit 2-Visit 3	14.0	-5.694	<0.001
Anergia	Visit 1-Visit 2	8.0	-5.867	<0.001
	Visit 1-Visit 3	0.0	-6.027	<0.001
	Visit 2-Visit 3	20.0	-5.621	<0.001
Thought Disturbance	Visit 1-Visit 2	168.0	-2.567	0.010
	Visit 1-Visit 3	63.0	-4.793	<0.001
	Visit 2-Visit 3	114.0	-3.775	<0.001
Activation	Visit 1-Visit 2	172.0	-2.517	0.012
	Visit 1-Visit 3	48.0	-5.552	<0.001
	Visit 2-Visit 3	96.0	-4.774	<0.001
Paranoid/ Belligerence	Visit 1-Visit 2	73.5	-4.546	<0.001
	Visit 1-Visit 3	6.0	-6.187	<0.001
	Visit 2-Visit 3	137.0	-3.737	<0.001
Depression	Visit 1-Visit 2	116.0	-3.610	<0.001
	Visit 1-Visit 3	24.0	-5.948	<0.001
	Visit 2-Visit 3	72.0	-5.154	<0.001
Supplemental	Visit 1-Visit 2	81.0	-4.398	<0.001
	Visit 1-Visit 3	0.0	-6.388	<0.001
	Visit 2-Visit 3	72.0	-5.160	<0.001

DISCUSSION

The purpose of pharmacotherapy in a patient with schizophrenia is not just alleviation of the symptoms but also the subsequent overall improvement in the life functioning as an effect of the treatment. The present study shows that there is significant improvement in the sexual functioning of the persons with both positive symptom and negative symptom subtype of schizophrenia when compared to the baseline visit (patient not on any medication) to the third visit (three months after starting anti-psychotic medication). This finding is consistent with another study (Tharoor et al 2015) that the sexual function in patients with schizophrenia needs special attention and it can be improved with medicines and other interventions.

CONCLUSION

Sexual function is one area, which is usually left unaddressed by the patients, their spouses and their treating clinicians alike. Present study has reiterated the importance of pharmacotherapy in improving the sexual dysfunction of patients with schizophrenia, in both positive symptom and negative symptom subtypes. Hence, some myths related to the impact of pharmacotherapy on sexual functioning by society can be changed and the treating team can ensure compliance to the treatment modalities.

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