Clinico-Epidemiological Comparison of Delusion-Prominent and Hallucination-Prominent Clinical Subgroups of Paranoid Schizophrenia

Anatoly Kreinin [1], Vladimir Krishtul [1], Zvi Kirsh [1], Michael Menuchin [1]

Abstract

Background: Though hallucinations and delusions are prominent basic impairments in schizophrenia, reports of the relationship between hallucinatory and delusional symptoms among schizophrenia patients are scant. **Aims:** To examine the epidemiological and clinical differences between mainly hallucinatory and mainly delusional subgroups of paranoid schizophrenia patients. **Methods:** One hundred schizophrenia patients, paranoid type, were recruited. In a cross-sectional study, participants were divided into Mainly Hallucinatory (H) and Mainly Delusional (D) subgroups. Demographic variables were compared and clinical characteristics were evaluated using the Scale for the Assessment of Positive Symptoms, the Scale for the Assessment of Negative Symptoms, and the Clinical Global Impression Scale. The Quality-of-Life Enjoyment and Satisfaction Questionnaire-18 was used to assess quality of life. **Results:** Clinically, the H group was more heterogeneous as expressed by the broader range of scores that described the clinical picture of patients in that subgroup (in 43 of 78 variables, 55.13%) and similar ranges of scores (31 of 78 variables, 39.74%) for patients in the D group. Duration of hospitalization was significantly longer in group H than in group D (p=0.047). There was no statistically significant difference between the H and D subgroups in demographic characteristics. **Conclusions:** There are distinct epidemiological and clinical differences between the H and D subgroups, with more severe positive and negative symptoms and greater functional impairment in the H group. Paranoid schizophrenia patients with prominent hallucinations have poorer prognosis and need intensive therapeutic rehabilitation beginning with onset-of-illness. Further genetic studies and comparisons of fMRI and/or PET findings are warranted to investigate additional distinctive characteristics of these subgroups.

Key Words: Delusions, Paranoia, Schizophrenia, Hallucinations

Introduction

Data from multiple genome scans suggest that schizophrenia is a heterogeneous, complex disorder with polygenic and environmental antecedents (1). Family, adoption and twin studies have shown that the phenotype extends beyond the core diagnosis of schizophrenia. The above heterogeneity manifests clinically with a wide range of symptoms including delusions, hallucinations, formal thought disorder, altered affect and cognitive functioning. Auditory hallucinations and delusions, although not pathognomonic, are the most common symptoms of schizophrenia.

[1]*Tirat Carmel Mental Health Center, Affiliated to Rappaport Faculty of Medicine, Technion, Israel Institute of Technology, Haifa, Israel*

Address for correspondence: Anatoly Kreinin, MD, PhD, Director of University Psychiatric Department, Tirat Carmel Mental Health Center, POB 9, Tirat Carmel 30200, Israel
Phone: (+972)-4-8559325; Fax: (+972)-4-8559325;
E-mail: anatoly.kreinin@pstira.health.gov.il; kranata@gmail.com

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Clinical Implications

In all, the findings support the data reported in the literature that paranoid schizophrenia develops later than the other subtypes of schizophrenia (7). Though there is a lack of significant statistical difference between demographic characteristics and age of onset in the two subgroups, the research findings support our hypothesis that there are distinct epidemiological and clinical differences between the two subgroups of patients (mainly hallucinatory and mainly delusional) diagnosed with paranoid schizophrenia.

The statistically significant longer mean duration of hospitalization in the hallucinatory group confirms that the paranoid schizophrenia process is more severe among patients that suffer from hallucinations as compared to patients who are, for the most part, delusional. However, contrary to our hypothesis, study findings revealed that there was no significant statistical difference between the age at onset of illness in the two subgroups. The high percentage of employment among participants prior to hospitalization and the relatively high levels of education suggest that cognitive capacity prior to illness in schizophrenia, paranoid type, is initially high.

In *DSM-IV* (2), delusions and hallucinations are the first and second of all the symptoms required for the diagnosis of schizophrenia in general and schizophrenia, paranoid type, in particular. These symptoms are the most prevalent in schizophrenic disorder, and are considered basic impairments of schizophrenia. Investigators often point out overlap between these two impairments or proximity on the same continuum, though others suggest that delusions are "higher up" on the Developmental Hierarchic Continuum than hallucinations (3). In a prospective study that lasted twenty years and evaluated forty-three schizophrenia patients, Harrow and Jobe examined the relation of delusions to hallucinations and thought disorder and disorganization to work disability and to later periods of global recovery and assessed several protective factors for delusional activity. They found that the correlations between delusions and hallucinations were all extremely high, and all six correlations over a twenty-year period achieved significance at $p<.001$ (4).

In recent decades, epidemiological studies and clinical trials point toward changes in the incidence and expression of classic schizophrenia symptoms; for example, decreased frequency of catatonic symptoms and increased paranoia and changes in the content of delusions in accord with social, cultural, geographic, and ethnic changes, and a relative increase of paranoid syndromes and auditory hallucinations in developed and industrialized countries (5). In an international pilot study of schizophrenia (IPSS), the World Health Organization examined the determinants of the outcome of severe mental disorder (DOSMD). The results of the investigation indicate differences in the process and development of the disorder between countries. For example, in developing countries, schizophrenia is more structured, and culture apparently influences the clinical picture of the disorder (6).

Schizophrenia, paranoid type, generally develops later (after age 20 and closer to age 30) in comparison to the other types of schizophrenia (catatonic, disorganized and not otherwise classified). However, it is possible that there is a gap between those that develop the illness at age 20 and those who develop the disease at age 30, and not only because of the gap in age at onset of illness, but rather owing to the clinical, phenomenologic, epidemiologic, prognostic and therapeutic gaps (7).

It is possible that there are biological differences between those with an earlier age at onset and it is conceivable that the subgroup of paranoid schizophrenia patients with prominent auditory hallucinations differs from the subgroup with prominent delusions.

Neurobiological studies that used imaging (MRI, fMRI) support this hypothesis and found differences in the upper temporal regions between those who hear voices and those who do not (8). Other studies that examined patients with auditory hallucinations using fMRI (9) and EEG (10) revealed impaired interactions between the frontal, parietal and temporal lobes. Additional fMRI studies found increased neuron activity in the primary auditory cortex and language-related area during hallucinatory activity in schizophrenia patients (11).

Patients with hallucinations had significantly higher white matter directionality in the lateral parts of the temporo-parietal section of the arcuate fasciculus and in parts of the anterior corpus callosum compared with control subjects and patients without hallucinations (8). At the individual level, the pathophysiology of schizophrenia is not uniform and any sample of patients with clinically defined schizophrenia is likely to include several different expressions of the disease. The importance of increasing awareness of the clinical expression of distinct subtypes of schizophrenia has been recognized in recent years (12-14). From the perspective of personalized medicine it is critical to view schizophrenia as a heterogeneous, complex group of disorders. Delineation of the clinical-phenomenological description of the disorder can facilitate and optimize personalized treatment.

In the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (2), paranoid type is a subgroup of the schizophrenia disorders. Empirical data, clinical observations and neurobiological imaging studies (8-11) allow us to suggest that this type of schizophrenia can be divided into two further subgroups:

1. paranoid schizophrenia, mainly hallucinatory subgroup, with prominent hallucinations and delusions influenced by auditory hallucinations; and,
2. paranoid schizophrenia, mainly delusional subgroup, with prominent impaired thought content. Hallucinations either are not at all present or appear for short periods of time and are not significant clinical factors.

Empirically it seems that there are clinical-phenomenological, biological and prognostic differences between these two subgroups. This difference presents a useful paradigm for understanding the links between symptom profiles and outcomes.

Epidemiological studies of schizophrenia generally examined the influence of demographic characteristics such as culture, environment, geographical differences, and age of onset of illness (5, 16, 17).

We aimed to delineate epidemiological and clinical differences between the mainly hallucinatory and mainly delusional subgroups of patients with schizophrenia, paranoid type. We hypothesize that there will be distinct epidemiological and clinical differences between these subgroups.

Methods

The study was approved by the Internal Review Board at Tirat Carmel Mental Health Center. After receiving a comprehensive explanation of the goals and study procedures, all potential participants provided written informed consent to participate in the study.

Study Population

Inclusion Criteria

Men and women ages 18–65, patients who meet *DSM-IV-TR* criteria for schizophrenia, paranoid type, and were first diagnosed between the years 1990–1995 and had the capacity and willingness to provide written informed consent to participate in the study.

Exclusion Criteria

Patients who refused to sign informed consent for participation in the study, lack of capacity to participate in the study, and clinical judgment of the treating psychiatrist.

Study Procedures

The investigators obtained a printout from the computerized database of the 2,590 inpatients from Tirat Carmel Mental Health Center who were diagnosed with schizophrenia, paranoid type, from Jan 1, 1995 until Jan 1, 2008.

Using the Research Randomizer program, of the 2,590 patients in the printout, 200 patients that met inclusion criteria for the study were chosen. A group of 100 participants was consolidated and each time a subject dropped from the study another participant was recruited from the random sample.

Potential participants were interviewed by an experienced investigator who recorded broad epidemiological information including age of onset of illness, education, gender, psychoactive substance abuse, family status prior to onset of illness, criminality, suicide attempts, place of residence, employment status prior to onset of illness, number and duration of hospitalizations. Study participants underwent a structured clinical interview in accord with the *DSM-IV-TR* criteria for schizophrenia disorder, paranoid type and abuse/dependence on psychoactive substances.

Evaluation of mental state, positive and negative symptoms, and evaluation of quality of life was performed using the following instruments:

1. SAPS: Scale for the Assessment of Positive Symptoms (hallucinations, delusions, bizarre behavior and positive thought disorders) (18)
2. SANS: Scale for the Assessment of Negative Symptoms (19)
3. Q-LES-Q-18: Quality of Life Enjoyment and Satisfaction Questionnaire, abbreviated version (20)
4. CGI-S: Clinical Global Impression Scale (Severity) (21)
5. SCID-I/P: Structured Clinical Interview for DSM-IV-TR Axis I Disorders, Patient Edition (22).

Statistical Analysis

Statistical analysis was performed with Pearson's chi-square test, t-test, odds ratio andd stochastic ordering (stochastic dominance). For statistical evaluation, the data were converted to nominal and ordinal variables.

The patients were divided into two subgroups:

1. Subgroup H: patients that had at least one hallucinatory episode that lasted for more than a month during five years since the onset of illness; and,
2. Subgroup D: patients diagnosed with schizophrenia, paranoid type that did not fulfill criteria for the first group.

Education was recorded as having completed elementary school, high school or higher education. Employment status was defined as unemployed, unskilled labor, professional work.

Table 1 Demographic Details of the Delusion and Hallucination Subgroups of Patients with Schizophrenia, Paranoid Type

Item		Subgroup Diagnosis		x^2	df	P Value
		Delusions	Hallucinations			
Education						
	elementary school	20	34	1.67	2	0.433
	high school	8	13			
	higher education	13	12			
Sex						
	F	11	10	0.89	1	0.345
	M	30	49			
Alcohol Use						
	no	34	51	0.04	1	0.842
	yes	7	8			
Cannabis Use						
	no	32	42	0.29	1	0.591
	yes	9	17			
Drug Use						
	no	28	33	1.08	1	0.299
	yes	13	26			
Marital state for first episode						
	divorced	2	4	0.82	2	0.663
	married	9	9			
	single	30	46			
Marital state for last episode						
	divorced	11	15	0.91	2	0.636
	married	4	3			
	single	26	41			
Criminality						
	no	24	31	0.15	1	0.698
	yes	17	28			
Suicidality attempts						
	no	28	38	0.04	1	0.850
	yes	13	21			
Living in hostel						
	no	24	28	0.79	1	0.375
	yes	17	31			
Job for first hospitalization						
	none	2	8	2.33	2	0.312
	not skilled	32	44			
	skilled	7	7			

x^2=statistical test; df=degrees of freedom model; P value=significance level of the null hypothesis.

Results

One hundred patients, 21 women and 79 men aged 18–65, were enrolled in the study. Forty-one were in the mainly delusional subgroup (D) and 59 were in the mainly hallucinatory subgroup (H). Though there was a non-significant tendency toward younger age at onset in the H group, there were no statistically significant between-group differences in the age at onset of illness, education, and employment status prior to illness onset, family status, abuse of psychoactive substances, criminality, number of suicide attempts, and place of residence. Ninety percent of all participants worked prior to their first hospitalization. Twenty-five percent of all participants had higher education.

Though there was no statistically significant between-group difference in the number of hospitalizations, the mean duration of total hospitalizations in the H group was sig-

Table 2 Statistical Analysis of Scale for the Assessment of Positive Symptoms (SAPS)

Question	Test of Independence			Comparison of Distributions			Stochastic Ordering	Odds Ratio	CI 0.95	
	x^2	df	P Value	x^2	df	P Value			Down	Up
SAPS1	**34.4**	**5**	**0.000**	**73.5**	**6**	**0.000**	**yes**	**0.06**	**0.02**	**0.18**
SAPS2	**24.8**	**5**	**0.000**	**52.9**	**6**	**0.000**	**yes**	**0.08**	**0.03**	**0.25**
SAPS3	**19.3**	**5**	**0.002**	**41.1**	**6**	**0.000**	**yes**	**0.07**	**0.01**	**0.29**
SAPS4	0.7	4	0.948	1.6	5	0.906	**yes**	0.77	0.24	2.50
SAPS5	1.5	3	0.680	3.2	4	0.521	**yes**	0.34	0.04	3.19
SAPS6	7.0	5	0.217	**15.0**	**6**	**0.020**	**yes**	**0.11**	**0.01**	**0.88**
SAPS7	**32.1**	**5**	**0.000**	**68.6**	**6**	**0.000**	**yes**	**0.08**	**0.03**	**0.22**
SAPS8	3.8	5	0.581	8.1	6	0.233	**yes**	0.56	0.20	1.53
SAPS9	6.7	5	0.246	**14.2**	**6**	**0.027**	no	0.87	0.38	2.01
SAPS10	6.3	**4**	0.178	**13.4**	**5**	**0.020**	**yes**	0.50	0.21	1.22
SAPS11	3.5	5	0.627	7.4	6	0.285	no	0.96	0.43	2.16
SAPS12	5.4	5	0.369	11.5	6	0.074	**yes**	0.34	0.12	1.02
SAPS13	1.8	4	0.775	3.8	5	0.577	no	1.33	0.54	3.28
SAPS14	6.2	5	0.286	**13.2**	**6**	**0.039**	**yes**	0.65	0.22	1.89
SAPS15	4.9	5	0.425	10.5	6	0.105	no	0.81	0.36	1.83
SAPS16	10.0	5	0.077	**21.2**	**6**	**0.002**	**yes**	**0.35**	**0.16**	**0.81**
SAPS17	10.4	5	0.066	**22.1**	**6**	**0.001**	no	0.53	0.23	1.27
SAPS18	7.8	5	0.168	**16.6**	**6**	**0.011**	no	0.89	0.27	2.93
SAPS19	3.9	5	0.562	8.4	6	0.214	**yes**	0.28	0.06	1.39
SAPS20	3.7	4	0.449	7.9	5	0.163	**yes**	0.34	0.03	3.84
SAPS21	9.3	4	0.054	**19.9**	**5**	**0.001**	no	0.39	0.14	1.09
SAPS22	0.3	3	0.964	0.6	4	0.964	no	1.17	0.29	4.64
SAPS23	4.6	4	0.334	9.8	5	0.082	**yes**	0.73	0.30	1.81
SAPS24	3.1	5	0.682	6.6	6	0.355	**yes**	0.47	0.18	1.25
SAPS25	6.3	4	0.176	**13.5**	**5**	**0.019**	**yes**	0.60	0.27	1.34
SAPS26	3.0	3	0.390	6.4	4	0.170	**yes**	0.22	0.03	1.91
SAPS27	**12.4**	**5**	**0.030**	**26.4**	**6**	**0.000**	**yes**	0.44	0.17	1.13
SAPS28	**10.8**	**4**	**0.029**	**23.0**	**5**	**0.000**	**yes**	**0.15**	**0.04**	**0.56**
SAPS29	7.3	5	0.198	**15.6**	**6**	**0.016**	**yes**	0.55	0.22	1.42
SAPS30	3.3	5	0.656	7.0	6	0.320	no	1.62	0.68	3.87
SAPS31	1.3	4	0.864	2.7	5	0.741	no	1.21	0.53	2.81
SAPS32	**11.6**	**4**	**0.020**	**24.8**	**5**	**0.000**	**yes**	**0.34**	**0.15**	**0.78**
SAPS33	0.0	1	0.854	1.5	2	0.473	**yes**	0.00	0.00	0.00
SAPS34	**11.3**	**5**	**0.045**	**24.2**	**6**	**0.000**	**yes**	0.34	0.03	3.84

nificantly longer than in the D group (655.9 days and 500.9 days, respectively; p=0.047).

Evaluation of participants using SAPS, SANS, Q-LES-Q-18, CGI-S revealed many differences and various correlations between the distribution of scores and distribution of patients between the H and D subgroups, with a tendency for stochastically higher scores for patients in the H subgroup.

In the SAPS scale, the stochastic order in the delusions items (SAPS 8, 10, 12, 14, 16, 19, 20), bizarre behavior (SAPS 23, 24, 25), and positive formal thought disorder (SAPS 27, 28, 29, 32, 34) suggests that delusions of reference, guilt, thought reading, stealing and bizarre behavior includes aggressive aggravated behaviors, repetition or stereotypic, formal thought disorders such as tangentiality, lack of communication, lack of logic, distractible speech and tend to be more severe in patients with hallucinations than in patients with delusions.

The odds ratio shows that in clinical variables—such as delusions of mind reading, lack of connection in thoughts, and distractible speech—the chance of scoring anything other than zero in the H subgroup is significantly higher than in subgroup D.

The distribution of scores significantly differs between the H and D subgroups especially on the SANS scales. On the same scale, there is stochastic ordering in the sections of affective flattening or blunting (SANS 1–80), alogia (SANS 9, 11–13), avolution-apathy (SANS 14, 16), anhedonia-asociality (SANS 20–22), and attention (23–25).

On the CGI-S, the distribution of scores was significantly different between the H and D subgroups. Stochastic order on the Q-LES-Q-18 scales and the Q-LES-Q 1 and 6 variables revealed that the patients in the H subgroups tend to describe themselves as feeling more healthy and happy than the patients in subgroup D.

Table 3 Statistical Analysis of Scale for the Assessment of Negative Symptoms (SANS)

Question	Test of Independence			Comparison of Distributions			Stochastic Ordering	Odds Ratio	CI 0.95	
	x^2	df	P Value	x^2	df	P Value			Down	Up
SANS1	**12.6**	**5**	**0.027**	**27.0**	**6**	**0.000**	**yes**	0.00	0.00	NaN
SANS2	7.2	5	0.206	**15.4**	**6**	**0.018**	**yes**	**0.35**	**0.13**	**0.91**
SANS3	8.3	5	0.141	**17.7**	**6**	**0.007**	**yes**	0.44	0.16	1.16
SANS4	5.3	5	0.379	11.3	6	0.079	**yes**	0.46	0.20	1.05
SANS5	**11.9**	**5**	**0.036**	**25.5**	**6**	**0.000**	**yes**	**0.23**	**0.07**	**0.78**
SANS6	7.8	5	0.170	**16.5**	**6**	**0.011**	**yes**	0.16	0.02	1.48
SANS7	**11.2**	**5**	**0.047**	**23.9**	**6**	**0.001**	**yes**	0.32	0.06	1.86
SANS8	**12.2**	**4**	**0.016**	**26.0**	**5**	**0.000**	**yes**	0.26	0.06	1.07
SANS9	10.5	5	0.062	**22.4**	**6**	**0.001**	**yes**	0.50	0.22	1.13
SANS10	**13.5**	**5**	**0.019**	**28.9**	**6**	**0.000**	no	1.04	0.17	6.55
SANS11	**22.9**	**4**	**0.000**	**48.9**	**5**	**0.000**	**yes**	**0.05**	**0.01**	**0.24**
SANS12	5.6	5	0.352	11.9	6	0.065	**yes**	0.44	0.20	1.00
SANS13	**13.5**	**5**	**0.019**	**28.9**	**6**	**0.000**	**yes**	0.68	0.13	3.54
SANS14	6.9	5	0.225	**14.8**	**6**	**0.022**	**yes**	0.50	0.22	1.13
SANS15	7.9	5	0.165	**16.8**	**6**	**0.010**	no	1.34	0.45	3.96
SANS16	6.8	5	0.233	**14.6**	**6**	**0.024**	**yes**	0.66	0.20	2.21
SANS17	9.1	5	0.105	**19.4**	**6**	**0.003**	no	0.52	0.13	2.08
SANS18	**13.8**	**5**	**0.017**	**29.4**	**6**	**0.000**	no	0.16	0.02	1.48
SANS19	**12.2**	**5**	**0.033**	**26.0**	**6**	**0.000**	no	0.50	0.10	2.34
SANS20	**19.0**	**5**	**0.002**	**40.5**	**6**	**0.000**	**yes**	0.20	0.04	1.07
SANS21	7.6	5	0.178	**16.3**	**6**	**0.012**	**yes**	0.00	0.00	NaN
SANS22	**12.0**	**5**	**0.035**	**25.6**	**6**	**0.000**	**yes**	0.00	0.00	NaN
SANS23	**13.3**	**5**	**0.021**	**28.4**	**6**	**0.000**	**yes**	0.42	0.11	1.61
SANS24	**10.5**	**4**	**0.033**	**22.4**	**5**	**0.000**	**yes**	**0.23**	**0.07**	**0.78**
SANS25	**13.4**	**5**	**0.020**	**28.6**	**6**	**0.000**	**yes**	0.16	0.02	1.48

Table 4 Statistical Analysis of the Q-LES-Q-18 and CGI-S

Question	Test of Independence			Comparison of Distributions			Stochastic Ordering	Odds Ratio	CI 0.95	
	x^2	df	P Value	x^2	df	P Value			Down	Up
QLESQ1	6.9	4	0.143	**14.7**	**5**	**0.012**	**yes**	0.12	0.01	1.11
QLESQ2	2.1	4	0.715	4.5	5	0.478	no	0.92	0.19	4.35
QLESQ3	**10.1**	**4**	**0.039**	**21.5**	**5**	**0.001**	no	0.39	0.09	1.71
QLESQ4	1.6	4	0.810	3.4	5	0.638	no	0.97	0.29	3.30
QLESQ5	6.8	4	0.146	**14.6**	**5**	**0.012**	no	0.26	0.06	1.07
QLESQ6	2.2	4	0.702	4.7	5	0.459	**yes**	0.52	0.13	2.08
QLESQ7	3.7	4	0.447	7.9	5	0.161	no	1.42	0.25	8.13
QLESQ8	6.8	4	0.147	**14.5**	**5**	**0.013**	no	Inf	NaN	Inf
QLESQ9	9.2	4	0.056	**19.7**	**5**	**0.001**	no	0.69	0.04	11.35
QLESQ10	1.1	4	0.893	2.4	5	0.797	no	0.69	0.04	11.35
QLESQ11	4.3	4	0.371	9.1	5	0.105	no	0.68	0.09	5.06
QLESQ12	4.2	4	0.381	8.9	5	0.111	no	3.70	0.42	32.95
QLESQ13	1.0	4	0.915	2.1	5	0.841	no	0.92	0.19	4.35
QLESQ14	0.8	4	0.945	1.6	5	0.901	no	1.71	0.41	7.02
QLESQ15	2.6	4	0.619	5.6	5	0.342	no	0.68	0.09	5.06
QLESQ16	5.3	4	0.260	**11.3**	**5**	**0.046**	no	Inf	NaN	Inf
QLESQ17	1.5	4	0.819	3.3	5	0.654	no	2.63	0.52	13.34
QLESQ18	6.4	4	0.170	**13.7**	**5**	**0.018**	no	0.76	0.25	2.30
CGI	**35.1**	**4**	**0.000**	**75.0**	**5**	**0.000**	**yes**	0.12	0.01	1.11

We found three subgroups in the patient group that reported hallucination-prominent voices: those that heard familiar voices (6%), those that heard unfamiliar voices (62%), and patients that heard both familiar and unfamiliar voices (32%).

Discussion

In all, the findings support the data reported in the literature that paranoid schizophrenia develops later than the other subtypes of schizophrenia (7). Though there is a lack of significant statistical difference between demographic characteristics and age of onset in the two subgroups, the research findings support our hypothesis that there are distinct epidemiological and clinical differences between the two subgroups of patients (mainly hallucinatory and mainly delusional) diagnosed with paranoid schizophrenia.

The H subgroup is more heterogeneous than the D subgroup. The general clinical picture that includes the intensity of positive and negative symptoms of the disorder, functional impairment and insight and judgment of patients in the H subgroup is more severe than that of the patients in the D subgroup (24).

In the literature, data concerning the comparative rates of schizophrenia in men and women are contradictory. The *DSM-IV-TR* reports equal rates of distribution between men and women (23); however, some studies report greater prevalence of schizophrenia among men compared to women (5). Our finding of a consistent significantly greater proportion of men among schizophrenia patients, paranoid type, in both the H and D subgroups supports the notion that these patients epidemiologically differ from patients with schizophrenia in general.

The statistically significant longer mean duration of hospitalization in the H group confirms that the paranoid schizophrenia process is more severe among patients that suffer from hallucinations as compared to patients who are, for the most part, delusional.

Contrary to our hypothesis, study findings revealed that there was no significant statistical difference between the age at onset of illness in the two subgroups. The high percentage of employment among participants prior to hospitalization and the relatively high levels of education suggest that cognitive capacity prior to illness in schizophrenia, paranoid type, is initially high.

The distribution of patients between the H and D subgroups—with a tendency for stochastically higher scores for patients in the H subgroup on the SAPS, SANS, Q-LES-Q-18, CGI-S and the finding that the H subgroup needed

a clinical description for most of the variables and had a broader range of scores than the range of scores used to describe patients in the D subgroup—confirms that the H subgroup is more heterogeneous. The stochastic order in most of the variables suggests that the clinical picture and severity of pathological symptoms is broader and more severe in the H subgroup.

Odd ratios for clinical variables such as delusions of mind reading, lack of connection in thoughts, and distractible speech suggest the need for additional research with a larger sample size in order to examine the existence of permanent associations between certain types of hallucinations and delusional thought content in schizophrenia patients.

The significantly different distribution of CGI-S scores between the H and D subgroups and the stochastic ordering suggest that the paranoid schizophrenia process is more severe among patients with hallucinations than among those with delusions.

Stochastic order on the Q-LES-Q-18 scales and the Q-LES-Q 1 and 6 variables suggests that the patients in the H subgroups tend to describe themselves as feeling more healthy and happy than the patients in subgroup D, despite the findings described above that show that the clinical picture including positive and negative symptoms and the course of the disorder and impaired functioning in the H subgroup are significantly more difficult than in the D group. The finding indicates a more severe cognitive impairment that is manifested in more severe impairment in insight and judgment among patients with paranoid schizophrenia in the H subgroup as compared to patients in the D subgroup.

Conclusions

Deeper understanding of the clinical, epidemiological and prognostic differences of schizophrenic disorders will contribute to development of unique therapeutic rehabilitation programs for patients in each of these subgroups.

In addition, owing to the cross-sectional design of the study, longitudinal investigations, genetic studies and comparison of fMRI and/or PET findings are warranted to enable exploration of additional aspects of these two subgroups.

Limitations

The present study has several limitations, so generalization of the findings beyond the study sample should be with caution. First, the study sample was relatively small. It is possible that other epidemiological/clinical differences between the D and H subgroups of patients with paranoid schizophrenia will be revealed in studies with larger study samples.

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