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Hallucinogenic drug induced states resemble acute endogenous psychoses: results of an empirical study

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Summary – Clinical evidence suggests that hallucinogenic drug-induced altered states of consciousness (ASCs) and the incipient, acute stages of endogenous psychoses share many common phenomenological features. The aim of our study was to assess hallucinogen-like phenomena in endogenous psychotic patients using standardised methods. We examined 93 endogenous psychotic patients, 50 healthy controls and a small group of drug induced psychotic patients (n = 7) with two ASC self-assessment scales (questionnaire APZ = Abnormer Psychischer Zustand = Altered State of Consciousness [Dittrich et al, 1985]; and questionnaire OAV = Abbreviation of the three subscales: Ozeanic Boundlessness/Angst = Dread of Ego Dissolution/Visionary Restructuralisation [Bodmer 1989]). Patients were examined shortly after remission of their last acute psychotic episode and they answered the questionnaires referring to the early phase of this episode. Differences in the questionnaire scores were significant between psychotic patients and controls. Drug induced patients had numerically higher scores than endogenous psychotic patients, however these differences were only significant for the APZ total score and the undifferentiated items of the APZ, but not for the three APZ subscale and the OAV scores. More than 50% of the endogenous psychotic patients answered 26% of the APZ- and 43% of the OAV-items with "yes". The OAV total score and the OSE (Ozeanische Selbstentgrenzung = oceanic boundlessness) scores of both questionnaires correlated significantly with BPRS Factor 3 (thought disturbance). Our results support the hypothesis that hallucinogen-like experiences represent common phenomena during the acute stages of endogenous psychoses. Remarkably, these phenomena include subjectively pleasant experiences of the OSE dimension. In the routine clinical assessment of endogenous psychotic patients experiences of this dimension may be more easily overlooked than the negative experiences of the AIA dimension (AIA: Angst vor der Ich-Auflösung = dread of ego dissolution).

altered states of consciousness (ASC) / hallucinogens / psychedelics / schizophrenia / psychopathology

INTRODUCTION

Hallucinogenic or psychedelic drug-induced altered states of consciousness (ASCs) are characterised by alterations in thinking with archaic modes of thought, changes in meaning or significance, hypersuggestibility, threatening or pleasant experiences of loss of control, disturbed time sense, predominantly visual perceptual distortions, synaesthesias, body image changes, and changes in emotional experience and expression presenting mostly with displays of primitive, rapidly changing and intense emotions [25]. Various psychedelics belonging to different chemical classes like lysergic acid (LSD), dimethyltryptamine (DMT), mescaline, and sometimes high dose amphetamines exert similar effects, while the effects of cannabis are supposed to be weaker [22]. The lack of substantial sedation or "clouding of consciousness" is a fundamental issue which differentiates the effects of these substances both from the effects of other psychotropic agents such as anticholinergics and NMDA antagonists (phencyclidine and phencyclidine-like drugs), and from the symptoms of classical organic psychoses [4, 7]. Psychedelic-like effects can be induced in humans also by means of certain psychological techniques or conditions (ie, sensory deprivation, meditation, sleep deprivation) [9, 22]. According to the work of Dittrich and co-workers [8, 9] the common nucleus of psychedelic and psychedelic-like ASCs consists of three poles: "oceanic boundlessness" (Ozeanische Selbstentgrenzung = OSE) including positive emotional states of happiness and serenity

as well as transcendental and mystical experiences of dissolution of boundaries; the somewhat contrary pole "dread of ego-dissolution" (Angst vor der Ich-Auflösung = AIA) presenting with features of a "bad trip"; and finally, "visionary restructuralisation" (Visionäre Umstrukturierung = VUS) including perceptional phenomena, altered experience of meaning, and ideas of reference [8, 9].

Incipient, early productive stages of endogenous psychoses resemble hallucinogenic drug induced ASCs in many aspects [2, 13, 26, 27]. Clinical descriptions indicate the presence of psychedelic-like states with disturbances of visual perception, synaesthesias, alterations of time and space perception and ecstatic-transcendental feelings during the incipient acute endogenous psychotic episodes [2, 5, 6, 11, 12]. Apart from its clinical importance for differential diagnostic considerations, this fact is interesting for basic psychiatric research because psychedelic states may serve as models for the acute stages of endogenous psychoses [10].

However, the degree of similarity between endogenous psychotic states and psychedelic states has been subject of controversial discussions: typical symptoms of endogenous schizophrenic patients like acoustic perceptional disturbances, delusional phenomena, loss of reality-adjustment, formal thought disorder and negative symptoms are thought to be uncommon in the psychedelic states. Similarly, visual perceptional phenomena and hallucinations are considered to be rare in schizophrenia, although this view has not remained unchallenged [23, 38]. Nevertheless, critics of the model psychosis paradigm have claimed that the hallucinogenic drug induced ASCs are not appropriate models for the schizophrenic disease [17].

By the end of the 1960s scientific interest in the hallucinogenic drug induced model psychosis strategy faded mainly due to political reasons. At present, interest in this field is growing again [15, 16, 18, 29, 32, 33, 34, 36, 37]. Therefore, it is essential to reexamine the principal question: How similar are psychedelic and endogenous psychotic states? The only systematic study with a standardised instrument that we are aware of [28] demonstrated a large coincidence of the clinical phenomena during acute schizophrenic episodes (n = 40) with the items of the APZ questionnaire for the assessment of psychedelic-like ASCs (APZ = Abnormer Psychischer Zustand = Altered State of Consciousness; [9]).

The principal aim of our study was to assess psychedelic-like phenomena in endogenous psychotic patients using standardised methods. We used the APZ and OAV questionnaires for the assessment of ASCs [3, 8], because they are well validated and avoid methodological weaknesses of older instruments, which either emphasised on unpleasant effects or assessed effects predicated on psychoanalytic theories (Abramson scales, Linton and Langs scales, Addiction Research Center Inventory, for a review see [31]). The following questions were addressed by the study: 1) can psychedelic-like phenomena be detected in acute endogenous psychotic patients? A healthy control sample and a small sample of drug induced psychotics served as control groups. We expected to find substantial APZ and OAV scores in the endogenous patient group, although they might be lower than the scores of the drug induced psychotic group; 2) can diagnostic subgroups be differentiated according to the pattern of their questionnaire scores? We expected to find similar total scores, but different subscale scores across the diagnostic subgroups (eg, higher OSE and lower AIA scores in schizomanic patients, opposite findings in schizodepressive patients); 3) do psychedelic-like phenomena correlate with acute psychotic symptoms, as assessed by the Brief Psychiatric Rating Scale (BPRS)? Particularly, we expected to find significant correlations between questionnaire total scores and BPRS Factor 3 (thought disturbance), which includes the items being most typical for acute psychotic disorders [24]; and finally 4) is the factor structure of the psychedelic-like experience of the endogenous psychotic patients similar to the three factor structure (OSE, AIA, VUS) described by Dittrich [8] in ASCs of healthy humans?

SUBJECTS AND METHODS

The demographics of our sample are given in *table I*. Ninety-three in-patients of the Psychiatric Department of the University of Technology Aachen (AA) and the Psychiatric Hospital Christophsbad (CH) with endogenous psychosis were included in the study. Inclusion criteria were: diagnosis of an acute episode (first-episode or relapse) of schizophrenic, schizoaffective or schizophreniform disorder according to DSM III-R criteria (DSM III-R code: 295.x) [1]. Exclusion criteria were: subchronic or chronic psychotic states with prominent negative and/or positive symptoms, additional significant diseases (eg, epilepsy and other neurologic disorders, endocrinopathies), substance abuse, refusal or lacking motivation to participate in the study. Fifty healthy volunteers served as controls.

A second, small control group consisted of seven in-patients of AA with a history of schizophrenia-like psychosis and concomitant abuse of the following drugs: cannabis (n = 3), amphetamine and cannabis (n = 1), LSD and cannabis (n = 1), LSD, amphetamine and cannabis (n = 2). Frequency of abuse had been daily or almost daily for cannabis and amphetamine and once to twice weekly for LSD. Duration of abuse had been 6 to 10 years. Average dosages had been high during the last weeks or months prior to hospital-

Table I. DSM III-R diagnosis codes [1], number of episodes and sex ratios of our clinical sample and controls.

Disorder	*DSM III-R code*	n	*m:f*	*first episode*	*episode 2–4*	*episodes > 4*	*age x ± SD*
Group 1. Endogenous psychotic patients	295.x	93	53:40	34	36	23	30.74 ± 8.26
1a. schizophrenia, paranoid type	295.3	54	33:21	15	24	15	31.01 ± 7.06
1b. schizophreniform disorder	295.4	15	6:9	15	0	0	28.00 ± 10.18
1c. schizoaffective disorder; manic episode	295.7	15	8:7	2	8	5	34.31 ± 9.66
1d. schizoaffective disorder; depressive episode	295.7	5	3:2	1	2	2	32.40 ± 7.37
1e. schizophrenia, undifferentiated type	295.9	4	3:1	1	2	1	21.67 ± 5.03
Group 2. healthy controls	–	50	19:31	–	–	–	31.68 ± 10.40
Group 3. drug induced psychotic disorder	292.11 305.30	7	7:0	4	3	0	26.57 ± 7.00

isation (up to 1 g hashish and 250 mg amphetamine daily). In all cases psychotic symptoms developed in parallel to continued abuse. The time period between development of psychotic symptoms and examination was 3 days to 6 weeks. All patients recovered from acute symptoms within 1 to 3 weeks under treatment with classic neuroleptics. Three of the seven patients had a previous history of psychotic episode(s) with associated drug abuse prior to the episode described here. Also those previous episodes had responded well to neuroleptics within 1 to 2 weeks. Therefore, the diagnosis of a drug-induced psychosis was established in all seven cases (DSM III-R codes: 292.11, 305.30). Later follow-up examinations demonstrated one further short psychotic episode in the absence of drug abuse in one patient with two previous psychotic episodes with associated drug abuse. In this one case it is possible that long term follow-up may establish the diagnosis of a schizophrenic disorder rather than a drug induced psychosis.

One member of our team (EH) examined the patients during the acute phase of their psychosis shortly after admission and completed the BPRS. In some cases, where this was not possible, he completed the BPRS on the basis of the patient records, an interview with the ward psychiatrist and a retrospective interview with the patient on a later occasion. After remission of the acute psychotic state (no paranoid ideation, no perceptional alterations, insight in disease processes) every patient was visited again, was informed about the aim of the study (to learn more about the subjective experience of psychotic patients during their acute illness), and was asked to participate. After having given oral informed consent, patients completed the APZ and OAV questionnaires referring to the early phase of their acute psychotic episode and rated the suitability of the questionnaires as a means of assessing their experiences on a three-point scale (0: totally unsuitable: my experiences were very different; 1) moderately suitable: my experiences were partly similar; 2) suitable, my experiences were very similar to the experiences described in the questionnaires). The healthy controls were instructed to complete the APZ and OAV questionnaires referring to their normal mental state during the waking hours of the last 7 days.

The APZ questionnaire has been developed and validated for the assessment of psychedelic and psychedelic-like ASCs in healthy humans [8, 9]. It consists of 72 dichotomic items. The OSE subscale includes 13, the AIA subscale 22, and the VUS subscale 14 items. The 49 items of the three subscales constitute the "core" of the APZ questionnaire. The remaining 23 "undifferentiated" items do not load specifically on one of the three subscales in the factor analysis [8, 9]. Some examples of the APZ items are given in *table II*. The OAV questionnaire is a further development of APZ and consists of 66 items [3]: the APZ-items were modified in a way that their loading on one of the three subscales was strengthened, many of the undifferentiated APZ-items were abandoned, and some new items were introduced. The degree of agreement to every item of the OAV questionnaire is scored on a visual analogue scale of 100 mm length between the two extremes "no, not more than usual" and "yes, extremely more than usual". The OSE subscale consists of 27, the AIA of 21, and the VUS subscale of 18 items.

In order to examine if psychedelic-like phenomena can be detected in acute endogenous psychotic patients and if diagnostic subgroups can be differentiated according to their questionnaire scores APZ and OAV data were analysed by analysis of variance (ANOVA) and multiple pair comparisons followed by Holm's procedure. Possible influences of sex and number of psychotic episodes were analysed by

Table II. Examples of the core items of the APZ-questionnaire [8].

Subscale OSE (Oceanic Boundlessness):
It seemed to me that my environment and I were one (yes – no)
I felt very happy and content for no outward reason (yes – no)
It seemed to me that there were no more conflicts and contradictions in the world (yes – no)
Subscale AIA (Dread of Ego Dissolution):
I felt threatened without realising by what (yes – no)
I observed myself as though I were a stranger (yes– no)
It seemed to me as though there were an invisible wall between me and my surroundings (yes – no)
Subscale VUS (Visionary Restructuralisation):
I saw light or flashes of light in total darkness or with closed eyes (yes – no)
Things around me had a new, strange meaning for me (yes – no)
I saw things that I knew were not real (yes – no)

ANOVA. We evaluated which items were answered frequently (> 50% of the patients) and which were answered rarely (< 10% of the patients) with "yes". Furthermore, the percentage of patients rating the APZ and OAV questionnaires as suitable, moderately suitable or totally unsuitable instruments for the assessment of their personal experiences during the acute phase of the last psychotic episode was determined. In order to examine if psychedelic-like phenomena correlate with psychopathological symptoms considered to be typical for schizophrenic diseases we performed correlation analyses between APZ, OAV and BPRS scores of the endogenous psychotic patients. Pearson correlation factors > 0.328 ($n = 93$, $\alpha_2 = 0.05$, statistical power = 0.90) were considered to indicate significant correlations. Finally, in order to examine if the factor structure of the psychedelic-like experience of the endogenous psychotic patients is similar to the three factor structure (OSE, AIA, VUS) described by Dittrich in ASCs of healthy humans [8] a principal component analysis (PCA) with Varimax rotation of the observed loadings was performed for the APZ and OAV questionnaires of the endogenous psychotic patients ($n = 93$). Loadings higher than 0.3 (statistical power = 0.90) were considered significant. All statistical procedures were perfonned using PC-SAS® Version 6.04. P-values lower than 0.05 were considered significant.

RESULTS

ANOVA and multiple pair comparisons with subsequent Holm's procedure revealed significant differences of every APZ and OAV total and subscale score between healthy controls and both groups of psychotic patients. Scores were slightly higher in the drug induced psychosis group compared to the endogenous psychosis group, but the only significant differences were those of the APZ total score and the APZ undifferentiated items. Data are summarised in *figure 1* and *table III*. There were significant differences of sex distribution in the three groups of patients and controls (Fisher's exact test, $P = 0.002$). However, there was no detectable influence of sex on the APZ and OAV total scores in these populations (ANOVA, APZ: $P = 0.68$, OAV: $P = 0.67$). Furthermore, no influence of the episode number on the BPRS, APZ and OAV total scores in the endogenous psychotic patients was found (ANOVA, APZ: $P = 0.38$, OAV: $P = 0.62$, BPRS: $P = 0.21$). Further analyses with the three bigger diagnostic subgroups (paranoid-hallucinatory schizophrenia, schizophreniform disorder and schizomanic episode) demonstrated significant differences of all APZ and OAV scores between the three subgroups and the healthy control group with the exception of the OAV-AIA subscale of the schizomanic patients. Schizomanic patients had significantly lower AIA subscale scores than the other two subgroups, otherwise there were no significant differences of APZ and OAV scores between the subgroups. Schizophreniform patients displayed higher BPRS Factor 2 scores than the other two subgroups, otherwise there were no significant differences of BPRS scores between the diagnostic subgroups and between endogenous psychotic and drug induced psychotic patients. The two smaller diagnostic subgroups with $n \leq 5$ were excluded from further statistical analyses. However, inspection of descriptive statistical data *(table III)* reveals relatively high AIA- and low OSE-scores in the schizodepressive group, which is in line with our hypothesis.

In order to assess how common ASC-like experiences are in endogenous psychotic patients we evaluated which items were answered frequently (> 50% of the patients) and which were answered rarely (< 10% of the patients) with "yes". Nineteen of the 72 APZ items (24.4%: 1 OSE, 7 AIA, 3 VUS and eight undifferentiated items) and 29 of the 66 OAV items (43.4%: nine OSE, 13 AIA and seven VUS items) were answered with "yes" by more than 50% of the patients. Six of the 72 APZ items (8.3%: one OSE, three VUS, two undifferentiated items) and none of the OAV items were answered with "yes" by less than 10% of the patients. In order to estimate the relevance of the ASC-like experiences in relation to the overall subjective experience of the acute psychotic episode the patients' judgements of the questionnaires were analysed. The APZ questionnaire was rated as a moderate or very good instrument for the assessment of the subjective experiences during their last acute psychotic episode by 82.8% of the endogenous psychotic patients (moderate: 39.8%; very good: 43%). The OAV questionnaire was rated moderate or very good by 88.2% of the patients (moderate: 48.4%; very good: 39.8%).

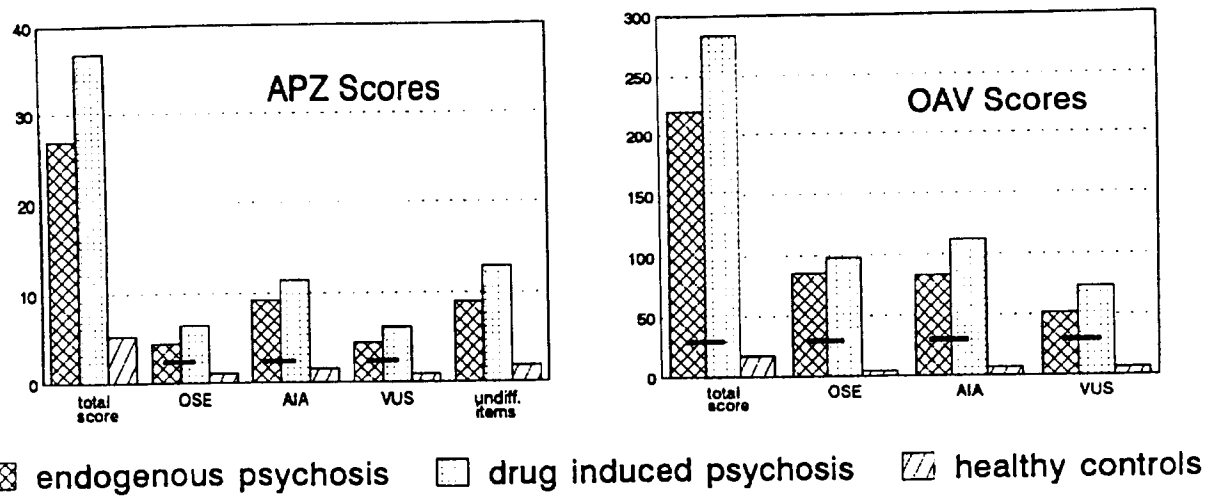

Fig 1. Mean AZP and OAV scores of the clinical populations and controls. Differences between groups that are not connected with a line are statistically significant (ANOVA, Holms, Tukey's studentized range test).

Table III. Mean values ± standard deviation of APZ, OAV and BPRS scores of the entire clinical sample and controls.

	1	*1a*	*1b*	*1c*	*1d*	*1e*	*2*	*3*
APZ total score	26.88 ± 11.22	27.89 ± 10.79	29.53 ± 11.60	23.00 ± 11.74	23.80 ± 14.38	21.75 ± 8.85	5.24 ± 6.74	36.86 ± 16.82
APZ- OSE	4.37 ± 2.93	4.31 ± 2.78	4.87 ± 2.80	4.73 ± 3.84	3.20 ± 3.03	3.25 ± 1.50	1.04 ± 2.06	6.43 ± 3.55
APZ- AIA	9.22 ± 5.21	9.94 ± 5.03	10.87 ± 5.50	5.73 ± 4.82	9.20 ± 5.31	6.25 ± 1.71	1.52 ± 2.65	11.43 ± 6.43
APZ- VUS	4.34 ± 2.32	4.33 ± 2.07	4.00 ± 2.39	4.47 ± 2.77	4.60 ± 3.05	5.00 ± 3.56	0.88 ± 1.30	6.14 ± 4.60
APZ undiff items	8.96 ± 3.64	9.30 ± 3.66	9.80 ± 3.73	8.07 ± 3.33	6.80 ± 4.32	7.25 ± 2.75	1.80 ± 2.26	12.86 ± 4.30
OAV total score	219.77 ± 108.97	235.15 ± 105.46	214.47 ± 130.48	180.0 ± 106.42	184.0 ± 82.90	214.47 ± 130.48	16.92 ± 31.47	283.86 ± 132.71
OAV-OSE	85.35 ± 63.24	90.48 ± 58.25	71.40 ± 78.03	97.00 ± 71.27	37.80 ± 34.02	71.40 ± 78.03	4.12 ± 8.44	98.14 ± 40.11
OAV- AIA	82.88 ± 53.99	91.30 ± 52.97	97.87 ± 54.72	34.73 ± 36.43	98.20 ± 52.24	97.87 ± 54.72	6.62 ± 16.36	112.00 ± 60.14
OAV-VUS	51.54 ± 29.24	53.37 ± 27.39	45.20 ± 36.39	48.27 ± 25.11	48.00 ± 25.23	45.20 ± 36.39	6.18 ± 13.46	73.71 ± 42.93
BPRS total score	55.91 ± 12.96	54.74 ± 13.71	65.73 ± 10.75	52.40 ± 9.55	52.00 ± 9.92	53.00 ± 11.40	-	65.29 ± 14.16
BPRS Factor 1	13.05 ± 5.76	13.28 ± 5.46	15.80 ± 6.13	9.20 ± 5.16	16.00 ± 3.87	10.50 ± 5.92	-	11.86 ± 4.14
BPRS Factor 2	8.53 ± 4.51	7.94 ± 4.46	12.40 ± 4.01	5.80 ± 2.21	9.60 ± 4.16	10.75 ± 4.86	-	11.29 ± 7.54
BPRS Factor 3	15.48 ± 4.59	15.94 ± 4.57	16.60 ± 3.50	15.20 ± 4.75	12.00 ± 4.36	10.50 ± 5.07	-	17.57 ± 3.10
BPRS Factor 4	9.74 ± 4.16	8.96 ± 4.08	10.87 ± 4.12	12.27 ± 2.91	6.80 ± 4.09	10.25 ± 5.56	-	12.00 ± 2.83
BPRS Factor 5	9.11 ± 4.69	8.61 ± 5.05	10.07 ± 3.99	9.93 ± 3.67	7.60 ± 4.04	11.00 ± 6.68	-	12.57 ± 4.93

1: total endogenous psychotic patients $n = 93$; 1a: paranoid schizophrenics $n = 54$; 1b: schizopheniform disorder $n = 15$; 1c: schizomanic episode $n = 15$; 1d: schizodepressive episode $n = 5$; 1e: undifferentiated and hebephrenic schizophrenics $n = 4$; 2: healthy controls $n = 50$; 3: drug induced psychosis $n = 7$. BPRS Factor 1: anxiety/depression; Factor 2: anergia; Factor 3: thought disturbance; Factor 4: activation; Factor 5: hostility/suspiciousness.

Correlation analyses between APZ, OAV and BPRS scores indicated significant correlations of the OAV total score and both OSE subscale scores with BPRS Factor 3 (thought disorder), which includes the items that are most typical for productive psychotic stages [14]. Furthermore, the APZ- and OAV-AIA subscale scores correlated significantly with BPRS Factor 1 (anxiety/depression). Results are summarised in *table IV*.

The principal component analysis (PCA), Scree Test and Varimax rotation demonstrated that the three factor structure of the OAV questionnaire can be reproduced satisfactorily in the group of the endogenous psychotic patients, while the reproduction of the three factor structure was weaker for the APZ questionnaire (variance explained by each factor of the OAV questionnaire: Factor 1 (OSE): 11.53; Factor 2 (AIA): 10.68; Factor 3 (VUS): 4.59; variance explained by each factor of the APZ questionnaire: Factor 1 (AIA): 7.60; Factor 2 (OSE): 6.17; Factor 3 (VUS): 5.33). Twenty-seven of the 49 APZ core items

Table IV. Significant correlations between APZ/OAV total and subscale scores and BPRS total and factor scores of endogenous psychotic patients ($n = 93$, $r > 0.328$, $\alpha_1 = 0.05$, statistical power = 0.90).

	APZ-OSE	*APZ-AIA*	*OAV total score*	*OAV-OSE*	*OAV-AIA*
BPRS Factor 1 anxiety/depression		r = 0.42 P = 0.0001			r = 0.50 P = 0.0001
BPRS Factor 3 thought disturbance	r = 0.33 P = 0.001		r = 0.33 P = 0.001	r = 0.41 P = 0.0001	

(55.1%) and 48 of the 66 OAV items (72.7%) could be assigned correctly to their subscales according to their Varimax rotated loadings. Comparisons of both configurations of loadings via PINDIS, under consideration of the 49 common variables for APZ and the 66 common variables for OAV, led to a communality of $R^2 = 0.77$, and $R^2 = 0.68$, respectively (communality concept ZW(I),X(I)). On the basis of Langeheine's computer simulation [19] this result cannot be explained by chance alone.

DISCUSSION

A variety of hallucinogenic drugs and psychological techniques induce similar qualitative alterations of consciousness (ASC) in healthy humans. Our results support the hypothesis that comparable experiences are also frequent in the acute stages of endogenous psychoses. The scores of the APZ and OAV questionnaires for the assessment of ASCs displayed significant differences between endogenous psychotic patients and healthy controls, whereas the differences between endogenous and drug-induced psychotic patients were mostly not significant. The frequencies of "yes"-answers suggest that 19 APZ- and 29 OAV-items describe common phenomena, whereas six APZ- items describe uncommon experiences of endogenous psychotic patients. Half of those uncommon items belong to the VUS-subscale and describe complex visual perceptional phenomena. Our data support the hypothesis that ASC-like phenomena occur during first episodes and relapses of the various forms of endogenous psychoses and are not restricted to schizophrenia. Schizoaffective disorders seem to be characterised by different extents of the experiences of the somewhat contrary poles OSE and AIA. A principal component analysis demonstrated a similar three-factor structure of the questionnaire OAV as in ASCs of healthy controls [8]. Hence, the three dimensions of the ASCs: "oceanic boundlessness" (OSE), "dread of ego-dissolution" (AIA) and "visionary restructuralisation" (VUS) [9] represent functional entities that can be found also in acute productive endogenous psychoses. This is particularly interesting for the OSE dimension, which includes pleasant, emotionally positive experiences. Experiences of this dimension are more easily overlooked in clinical practice than the negative experiences of the AIA dimension.

The OAV total score and the OSE scores of both questionnaires correlated positively with BPRS Factor 3, which includes the most typical positive schizophrenic symptoms like hallucinations, conceptual disorganisation, unusual thought content and grandiosity [14]. This finding is consistent with our hypothesis that during acute psychotic episodes there is a parallel development and partial overlap of psychedelic-like and classical positive psychotic symptoms. Moreover, it supports the view that pleasant subjective experiences are common in the beginning of acute, productive endogenous psychotic episodes [5, 12]. The positive correlations of the AIA scores (dread of ego dissolution) of both questionnaires with BPRS Factor 1 (anxiety/depression) demonstrate that unpleasant, dreadful psychedelic-like experiences correspond to clinically observable anxiety and depressive mood. In summary, although correlations are not high, they do confirm that ASC-like phenomena go in parallel with acute endogenous psychotic manifestations.

The majority of the patients considered the APZ and OAV questionnaires to be suitable or at least moderately suitable instruments for the assessment of their subjective experiences. This judgement can be considered valid, since the patients were completely or nearly completely remitted and did not present with lasting positive or severe negative symptoms at the time of the examination. Although we told the patients that there are no right or wrong answers, we cannot rule out the possibility that there was a tendency to rate the questionnaires too positively. Moreover, we cannot exclude the possibility that ASC-like experiences are unspecific elements occurring not only in the schizophrenic and schizophrenia spectrum psychoses, but also in other psychiatric diseases. Although clinical experience strongly suggests that this is not the case, we are currently examining patients with various psychiatric disorders using the same procedures, in order to clear this point.

The true frequency of psychedelic-like phenomena in endogenous psychoses may well be underestimated in general, as was hypothesised by very early researchers [2, 30]. Some psychedelic-like alterations of perception, thought and action may already occur sporadically or in phases long before the breakout of a full-blown first schizophrenic episode. These phenomena represent so called schizophrenic basic symptoms [35]. During the incipient acute psychotic episodes with high process activity these psychedelic-like experiences become grossly intensified and are mostly accompanied by strong emotional alterations. The criticism that psychedelic-induced ASCs and schizophrenia are more different than alike [17] misses the point of syndrome- rather than nosology-oriented approach. Indeed, clinical experience suggests that the experimentally induced ASCs are not appropriate models for the nosological entity schizophrenia, but may well be appropriate models for the psychopathological syndrome of the incipient acute stages of endogenous psychotic disorders, as was already pointed out by Beringer [2] and more lately by other researchers and clinicians [5, 6, 11, 12]. On the other hand, the frequency of phenomena that are thought to be typical for endogenous psychosis may also be underestimated in the psychedelic states: especially with higher doses, or if somebody is given a hallucinogenic drug unknowingly, the ASC may present with acoustic hallucinations, severely paranoid and even catatonic-like states [10, 20, 30]. In summary, based on the evidence that psychedelic states and productive stages of endogenous psychoses share many similarities, hallucinogen induced ASCs may be considered as useful models for the psychopathological alterations in the incipient acute stages of schizophrenic and schizophrenia spectrum psychoses.

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