Do cenesthesias and body image aberration characterize a subgroup in schizophrenia?

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Objective: To identify and characterize a subgroup of schizophrenia patients with marked and dominating bodily sensations (cenesthesias and body image aberration).
Method: We assessed cenesthesias and different aspects of body image aberration systematically along with common (general, positive and negative symptoms) and ego-psychopathology in 60 patients with acute paranoid schizophrenia. Cluster analysis was applied to identify subgroups. Psychopathology scores of the clusters were compared at admission and after 2 weeks of hospital treatment.
Results: One of the three clusters comprised of 14 patients (23.3%) with marked disturbances of body experience (underestimation of lower extremities, desomatization, boundary loss and diminution). The subgroup was further characterized by significantly higher ego-psychopathology scores at admission. Some of the differences held true over a 2-week period.
Conclusion: The findings from the present study suggest that cenesthesias and body image aberration might represent an additional dimension of psychopathology that might be used for defining a nosological subtype of schizophrenia.

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Introduction

The question as to whether a nosological subgroup characterized by abnormal bodily sensations can be identified within the symptomatically hetero-geneous 'group of schizophrenias' has been discussed ever since Bleuler (1) introduced the term schizophrenia into the literature. Most notably, Huber (2–4) described a subtype called 'cenesthetic schizophrenia', and the term 'cenesthopathic schizophrenia' is included within the category 'other schizophrenia' (F20.8) in ICD-10 classification (5). Diagnostic Statistical Manual (DSM)-IV (6) does not have a similar diagnostic category. In clinical practice, this diagnosis is rarely made, and the defining characteristics as well as its clinical relevance remain unclear. It appears that the majority of patients with marked bodily sensations are currently diagnosed as suffering from paranoid schizophrenia, possibly because these phenomena are generally classified as somatic hallucinations or delusional perception.

A wide range of inconsistent concepts and umbrella terms has been used in the literature to describe the corresponding phenomenology (7). The term cenesthesia is mainly applied in the German ('Coenästhesie, Gemeingefühl'), French ('sensibilite generale, cenesthesie') and Russian ('cenesthopathies') literature, whilst the anglo-phone literature mainly refers to the term 'body image aberration' in summarizing abnormal bodily sensations. Their relationship to each other and their association with nuclear psychopathology as well as their relevance for the definition of the cenesthopathic subtype have not been investigated so far and the concepts have overlapping connotations. Theoretically, disturbances of ego-consciousness, ego-disintegration in particular, have been assigned significance in generating abnormal bodily sensations (8, 9).

To investigate the classification of schizophrenic patients into distinct groups, cluster analysis with subsequent examination of differences in clinical characteristics has been repeatedly suggested as the statistical method to achieve this (10, 11).

In this study, we hence assessed cenesthesias and different aspects of body image aberration along with common and ego-psychopathology in a

sample of patients with acute paranoid schizophrenia, aiming to identify a subgroup and its characteristics.

Material and methods

The study group consisted of consecutively admitted patients to a psychiatric hospital with catchment area responsibility in Berlin, Germany. Patients between 18 and 60 years of age and suffering from paranoid schizophrenia were included. Diagnosis was initially made by the psychiatrist-in-charge according to DSM-IV, and was later confirmed by a research psychiatrist. Patients with a history of a serious physical illness, physical disability or substance abuse/dependency were excluded. All subjects gave informed consent. The sample was restricted towards this subtype in order to assess a homogenous group of patients with predominantly positive symptoms. Patients were assessed within 3 days of admission, the follow-up assessment was carried out after 2 weeks. The interviewer, a research psychiatrist, was not involved in treatment. Basic sociodemographic and clinical data and details of psychiatric history were obtained from the patient or from their medical records (sex, age, body mass index, marital and employment status, accommodation, educational background, duration of illness and number of previous hospitalizations).

Various aspects of body experience were assessed, representing cenesthesias as well as cognitive, affective and perceptual facets of body image pathology. The latter were chosen because they have been found to specifically occur in patients with paranoid schizophrenia in previous studies (12–14).

The following instruments were applied:
1. *Bonn Scale for Assessment of Basic Symptoms/* Category D 'Cenesthesias' [BSABS; 16 items (15), see Table 1]. The scale was developed in collaboration with Huber and follows his concept of cenesthesias as basic symptoms of schizophrenia. Klosterkötter et al. (16, 17) re-validated the subsyndrome 'cenesthesias' through a multivariate cluster analysis of the BSABS.
2. The modified *Image-Marking Procedure* (IMP) (12, 18, 19) was used for recording segmental body size perception of lower extremities (four distances, united to a segment called 'Legs'). Patients marked distances as estimated in response to a two-point tactile stimulus by the investigator (using a beam bender similar to an instrument called an 'anthropometer' in order to avoid the psychological impact of direct body-to-body contact). Body perception indices (BPI) were calculated according

to the established formula: perceived size/real size $\times$ 100 (20). Priebe and Röhricht (14) recently described psychometric properties of this instrument, indicating good internal consistency: Cronbach's α for the four measures of BPI 'legs' (thigh and calf each frontal and sagittal) was 0.84, for the two measures of BPI 'head' (frontal and sagittal) 0.51, and for the four items forming BPI 'trunk' (shoulder/waist/hips/abdomen) 0.78. The retest-reliability was 0.75 for BPI 'legs', 0.75 for BPI 'head' and 0.84 for BPI 'trunk'.
3. Body cathexis ('How satisfied are you with your body?') was self-rated on a 10-cm long *Visual Analogue Scale* (extreme points: 0 = totally satisfied, 10 = totally dissatisfied). Each 1 cm is marked so that the scale combines qualities of a Visual Analogue-Scale (VAS) with features of an 11-point rating scale in order to increase accuracy and consistency of ratings (21, 22).
4. The same type of scale was applied to assess aspects of body concept called 'small' (feeling as if the body or its parts is/are unusually small), 'large' (feeling as if the body or its parts is/are unusually large) and 'alteration of body size' (feeling as if the body size has changed). Each item had the extreme scores 0 (absolutely right) and 10 (absolutely wrong).
5. Two other aspects of body concept were assessed using subscales of the *Body Distortion Questionnaire* (BDQ; 'boundary loss' and 'depersonalization' with 10 items each) (23); the 'depersonalization' subscale refers only to body related items and therefore represents desomatization.
Psychopathology was assessed on the following scales:

1. Positive and Negative Symptom Scale (PANSS) (24).
2. Ego-Psychopathological Interview Schedule (EPP) (9). This instrument was developed and empirically validated by Scharfetter (first published in 1981) on the basis of his phenomenological concept of ego-consciousness. The EPP consists of 53 items, covering five basic dimensions of ego/self-awareness ('identity', 'demarcation', 'consistency/coherence', 'activity' and 'vitality'). It also includes additional factors called 'overcompensation', 'body', 'thought process' and 'psychomotor behaviour'. Following a structured interview, ratings are given on single items (present/not present) as well as with respect to the five subscores/dimensions (scores between 0 and 5, graduation depending on severity and intensity).

Antipsychotic medication was recorded in chlorpromazine equivalents, calculated according to Kane (25). Adverse effects of medication were

documented as reported by the patient subjectively and were assessed using the Extrapyramidal Rating Scale (EPRS) (26).

Statistical analysis

Iterative k-means cluster analysis was used to identify subgroups with cenesthesias and facets of body image aberration as cluster criteria and confirmed by discriminant analysis. Examining the association between cenesthesias, body image aberration and other psychopathology, Pearson correlation coefficients were calculated. Identified clusters were compared regarding clinical variables at admission and after 2 weeks treatment, applying non-parametric statistical procedures (Mann–Whitney) because of the small sample size. The analysis was carried out using SPSS for Windows Version 8.0. Throughout the study we used $P < 0.05$ as the level of significance (two-tailed).

Results

Demographic and clinical characteristics

At the time of initial assessment the sample consisted of $n = 60$ patients (36 female, 24 male) with a mean age of 35.9 years (SD 11.1) and a mean body mass index of 23.7 (SD 4.6); the patients mean duration of illness was 6.0 years (SD 6.3) with a mean frequency of 3.8 previous hospitalizations (SD 3.3). All patients were treated with antipsychotics: mean chlorpromazine equivalent at admission 487.0 mg (SD 457.5) and they displayed few extrapyramidal side-effects as measured with the EPRS (mean 0.20, SD 0.25).

A total of 43 patients were re-assessed after 2 weeks in-patient treatment, the remaining 17 patients were already discharged or refused follow-up assessment.

Out of the total sample two main cluster subgroups were identified, consisting of $n = 14$ with and $n = 42$ without marked abnormal bodily sensations respectively, $n = 12/30$ after 2 weeks (how we derived the clusters and their significance will be fully explained further down); the subgroups were comparable regarding these demographic and clinical characteristics.

Assessing psychopathological symptoms through the Positive and Negative Symptom Scale/PANSS and the EPP, the following scores were obtained (at admission/after 2 weeks): PANSS-general: mean 39.0/32.6, SD 8.9/8.8; PANSS-negative: mean 14.0/12.1, SD 7.0/4.7; PANSS-positive: mean 19.3/14.6, SD 5.3/5.2; EPP-total: mean 12.5/6.8, SD 5.6/5.3; EPP-activity: mean 3.3/1.9, SD 1.5/1.6;

EPP-vitality: mean 1.7/0.6, SD 1.4/0.9; EPP-identity: mean 1.5/0.8, SD 1.8/1.4; EPP-consistency: mean 2.4/1.4, SD 1.5/1.4; EPP-demarcation: mean 3.0/2.1, SD 1.4/1.6.

Cenesthesias and body image aberration

Table 1 summarizes cenesthesias as assessed on the BSABS. The most frequent bodily sensations reported include 'numbness; stiffness', 'desomatization', 'abnormal pain', 'emptiness, heaviness, lightness, falling/sinking, levitation/elevation' and 'diminution, shrinking, enlargement, constriction', each rated by more than 25% of the sample.

Mean scores of body image aberration of the whole sample at admission and after 2 weeks are presented in Tables 2 and 3. They indicate a tendency to underestimate lower extremities and moderate disturbances of body concept (including symptoms of desomatization and boundary loss as well as, to a lesser degree, feelings of body size change). Body cathexis was positive.

The above symptoms did not show any significant association (Pearson's r or t-tests) with demographic (age, sex, body mass index) and clinical characteristics (number of previous hospitalizations, duration of illness, dosages of neuroleptic medication in chlorpromazine equivalents and extrapyramidal side-effects). With regard to psychopathological symptoms, a negative association between underestimation of lower extremities and anxiety (PANSS-anxiety: $r = -0.28$, $P < 0.05$) was found as hypothesized, consistent with find-

Table 1. Scores on Bonn Scale for the Assessment of Basic Symptoms Category D/Cenesthesias (%) of sample $n = 60$

		%
1	Sensations of numbness, stiffness and feeling strange	31.0
1.1	Somatopsychic depersonalization	48.3
2	Sensations of motor weakness	16.7
3	Circumscript sensations of pain	28.3
4	Migrating sensations	8.3
5	Electric sensation	20.0
6	Thermic sensation	21.7
7	Sensations of movement, pulling or pressure inside the body or on its surface	10.0
8	Sensations of abnormal heaviness, lightness or emptiness, of falling or sinking, levitation or elevation	43.3
9	Sensations of extension, diminution, shrinking, enlargement or constriction	26.7
10	Kinaesthetic sensations (feeling as if body moves without movement being observed)	5.0
11	Vestibular sensations	11.7
12	Dysaesthesia caused by physical contact	15.0
13	Unclassified cenesthesias	18.3
14	Dysesthetic crisis	3.3
15	Paroxysmic state of anxiety	16.7

Item-translation as given by Klosterkötter et al. (16).

Table 2. Body experience characteristics of sample $n = 60$ and of Cluster subgroups; subgroup comparison (mean/SD/Mann–Whitney) between Cluster 1 and 3 at admission

	Sample $n = 60$		Cluster 1 $n = 42$		Cluster 2 $n = 4$		Cluster 3 $n = 14$		Mann–Whitney	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Z	P
BSABS-cenesthesias	3.4	3.2	2.9	2.7	5.1	4.2	4.6	3.9	−1.5	n.s.
BPI-legs	98.1	44.0	101.1	17.5	222.9	48.9	55.4	21.7	−5.4	< 0.001
BDQ-boundary loss	3.6	3.2	2.8	2.7	4.3	4.2	5.8	3.4	−3.1	< 0.01
BDQ-desomatisation	3.1	3.1	2.4	2.7	2.3	3.2	5.2	3.1	−3.2	< 0.01
VAS-small	2.3	3.7	1.2	2.9	5.0	5.8	4.6	4.0	−2.6	< 0.01
VAS-large	2.2	3.5	1.6	3.2	3.8	4.8	3.4	3.7	−1.5	n.s.
VAS-body size change	1.8	3.2	1.0	2.3	5.0	3.6	3.4	4.2	−1.8	n.s.
VAS-body cathexis	5.8	2.7	5.9	2.9	7.8	2.2	5.0	1.9	−1.3	n.s.
EPP-body	1.3	1.2	1.1	1.1	1.8	1.7	1.7	1.3	−1.5	n.s.

SD = Standard deviation, n.s. = not significant.

Table 3. Body experience characteristics of sample $n = 43$ and of Cluster-subgroups; subgroup comparison (mean/SD/Mann–Whitney) after 2 weeks

	Sample $n = 43$		Cluster 1 $n = 30$		Cluster 3 $n = 12$		Mann–Whitney	
	Mean	SD	Mean	SD	Mean	SD	Z	P
BSABS-cenesthesias	2.7	3.1	2.6	3.1	3.4	3.6	−0.9	n.s.
BPI-legs	92.3	36.2	101.1	39.2	76.1	25.7	−2.4	< 0.05
BDQ-boundary loss	2.4	2.6	2.1	2.5	3.3	2.6	−1.5	n.s.
BDQ-desomatisation	1.9	2.5	1.7	2.3	2.9	3.0	−1.0	n.s.
VAS-small	1.0	2.7	0.8	2.5	2.0	3.5	−1.2	n.s.
VAS-large	1.7	3.5	1.6	3.4	2.6	4.1	−1.2	n.s.
VAS-body size change	1.2	2.9	1.4	3.2	0.9	2.2	−0.3	n.s.
VAS-body cathexis	6.1	3.1	6.0	3.2	5.6	2.6	−0.5	n.s.

SD = Standard deviation, n.s. = not significant.

ings of a previous study (12, 27). VAS 'large' was positively correlated with PANSS-scores 'general' and 'positive' as well as item-scores 'delusions', 'grandiosity', 'unusual thought content', 'mannerism' ($r = 0.26$–0.56, $P < 0.05$ to < 0.001) and negatively correlated with 'Depression' ($r = -0.36$, $P < 0.01$). No other result reached statistical significance.

Cenesthesias were found to be positively correlated with disturbances of body concept, i.e. boundary loss ($r = 0.45$), desomatization ($r = 0.46$), feeling as if the body or its parts feel unusually small ($r = 0.45$) and unusually large ($r = 0.52$) and as if the size of the body has changed ($r = 0.42$). They were also positively associated with the EPP-factor 'body' ($r = 0.64$; each $P < 0.01$), but not with disturbances of body size perception (underestimation of lower extremities) and body cathexis.

Subgroup-identification/cluster descriptions

On the basis of variables representing disturbed body experience in paranoid schizophrenia (BPI-legs, EPP-body, BSABS cenesthesias, BDQ depersonalization and BDQ boundary loss, VAS-small,

VAS-large, VAS-body size change, VAS-body cathexis), k-means cluster analysis was conducted. The majority of the sample (42 patients) scored in cluster one. The cluster centre shows only slight disturbances on boundary loss/desomatization (BDQ) and cenesthesias (BSABS) scales, and no disturbance on body size perception. The second cluster comprises of only four clients, mainly characterized by very high scores on BPI legs, indicating remarkable overestimation of lower extremities. The third cluster (14 patients) represents a sample of patients with marked disturbances of body experience, i.e. moderate cenesthesias scores and high boundary loss/desomatization scores, marked underestimation of lower extremities (BPI scores < 100) and high scores on VAS-scales (particularly 'small' and 'body size change'). A confirmatory discriminant analysis correctly classified 93% of cases. Findings are summarized in Table 2.

At follow-up after 2 weeks (Table 3) the subgroups consisted of $n = 30/1/12$ patients. The disturbances of body experience within the third subgroup as well as the differences between the two major subgroups were consistent, but only the difference on BPI score reached statistical significance.

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Clinical characteristics of the cluster-subgroup with body image aberration

The second cluster subgroup ($n = 4/1$) was not considered for further statistical analysis because of its small size. There were no significant differences between the two remaining groups with respect to all demographic and clinical data, including cognitive disturbances as measured through the PANSS scale.

Comparing the two main subgroups, no significant differences in PANSS-scores could be detected (Z between –0.1 and –1.1), whereas the subgroups differed with regard to EPP scores 'vitality' ($Z = –2.3$, $P = 0.021$), 'identity' ($Z = –2.2$, $P = 0.027$), 'demarcation' ($Z = –3.2$, $P = 0.002$) and the total score ($Z = –3.1$, $P = 0.002$) at admission, indicating a higher degree of psychopathology in these areas. When re-assessed after 2 weeks, the initially identified subgroup with marked body image aberration still displayed a significantly higher score for the subscale 'identity' ($Z = –2.6$, $P = 0.010$) and with a tendency towards significance for the total EPP score ($Z = –1.8$, $P = 0.071$). No other difference reached statistical significance because they had reduced and because of the smaller sample size ($n = 30$ vs. $n = 12$).

Discussion

This is the first study to have comprehensively examined cenesthesias and body image aberration along with common psychopathology in a sample of paranoid schizophrenia patients. Hereby, a proposed subgroup of schizophrenia patients with abnormal bodily sensations has been empirically identified through cluster analysis. Results from confirmatory discriminant analysis and observed cluster differences on ego-psychopathology indicate face-validity of the clusters derived. Despite methodological limitations of the study such as the small sample size and the restriction to paranoid schizophrenia, the results may be interpreted in at least two different ways.

First, the results support the repeatedly made observation of a close relationship between cognitive- or ego-disintegration and disturbances of body experience (8, 9, 28, 29). The phenomenological concept of ego-psychopathology has so far received little attention, although several psychiatrists since Heinroth (30) described schizophrenia as a severe ego-disorder. Accordingly, Schneider (31) described delusional perception as well as somatic and other passivity experiences as first-rank symptoms of schizophrenia, also referred to as a loss of 'Meinhaftigkeit' (belonging to myself).

The simultaneous nature of disturbances of ego-demarcation and body-boundary loss within our sample suggests that these phenomena comply with or represent each other.

Secondly, the findings of the present study are in line with results of other cluster and factor analytic studies, trying to identify symptom dimensions in schizophrenia and concluding that the negative–positive dichotomy in schizophrenia appears to be of questionable validity and hence an oversimplification (e.g. 10, 32, 33). The reported cluster is probably close to a cluster subgroup described by Carpenter et al. (34) and called 'hypochondriacal schizophrenia' with high ratings on somatic concerns. The results may, therefore, be interpreted in the context of consistent theoretical considerations in literature, suggesting a nosological subtype of schizophrenia with dominating abnormal bodily sensations, termed as 'hypochondriac paraphrenia' (35) or 'hypochondriac hebephrenia' (36). Later on, Leonhard (37) described 'systematic hypochondriacal paraphrenia' as a subform of paranoid schizophrenia. Huber (2, 3) eventually introduced a subtype called 'cenesthethic schizophrenia', mainly characterized by dominating abnormal bodily sensations/feelings and with hypochondriac leanings. Within his unsystematic collection of psychopathological phenomena, Huber did not distinguish between different facets of body experience. Prevalence data on this subtype from the very few studies available vary between 6.25% (38) and 18% (2) of schizophrenia patients. The inconsistency of symptom definitions, inclusion criteria and methodological approaches makes a comparison of these publications difficult.

The syndrome characterizing the subgroup identified in this study appears to be different from Huber's concept of cenesthetic schizophrenia, although there might be a considerable overlap. Huber (3, 4) focussed on a group of patients with hypochondriacal prodromal symptoms or unspecific somatic complaints prior to the onset of schizophrenia with dominating cenesthesias. Our study aimed instead at a complex assessment of a range of abnormal bodily sensations in acute patients, using defined and distinct categories. As a result, patients in the identified cluster subgroup did display higher scores on cenesthesias, but the difference was not statistically significant, whereas distorted body size perception and disturbances of body concept clearly differentiated between groups. Assessing the relationship of different categories of abnormal bodily sensations, cenesthesias were found to be significantly positively related with disturbances of body concept. This suggests classification of these phenomena as

delusional perception rather than perceptual aberration, i.e. misinterpretation of internal perception. Huber (2, 4) focussed his aetiological hypotheses on the limbic system and the diencephalon due to phenomenological analogies with spontaneous sensations of the thalamus and symptoms related to organic neural dysfunction of these areas. Alternatively, our phenomenological findings warrant a different explanatory model, considering a deficit in integrating various visual and somatosensory inputs into one stable central nervous representation. Leonhard (39) discussed a theory that 'bodily processes otherwise not accessible for the conscious thinking penetrate into the consciousness'. This could result in a variety of misperceptions (e.g. cenesthesias) or specific somatic agnosia (e.g. underestimation of lower extremities), suggesting a central pathogenic role of parietal structures.

Clinical implications of identifying a subgroup with marked body related symptomatology remain to be explored in further longitudinal studies. Abnormal bodily sensations are also represented within the concept of 'basic symptoms' which has recently received increased attention. Basic symptoms have been found to be early predictors for developing schizophrenia (e.g. 16, 40, 41). Other potential clinical implications that might warrant further studies are a specific response to different neuroleptics including body-related side-effects. The association between ego-psychopathology and disturbances of body experience might be addressed therapeutically through body-oriented intervention strategies (e.g. sensory awareness training, movement and drama therapy, dance therapy). According to Scharfetter (8, 9) this behavioural approach aims at reconstructing a realistic, coherent and integrated ego/self-experience, subsequently improving reality-testing and coping strategies.

The findings require replication, and patients with subtypes other than paranoid schizophrenia have to be investigated to assess whether a similar subgroup with abnormal bodily sensations can be identified across the full spectrum of subtypes. This study emphasizes that further research should go beyond mere listing of all abnormal bodily sensations and aim at systematic categorization. This may explore whether neurocognitive impairment, such as dysfunction of sensorimotor gating and/or deficits in preattentive/attentive information processing, partly explain body-related phenomena. Disturbances of body experience may be considered as relevant phenomena for further analysis of dimensional symptom models and subsequent subtype classification in schizophrenia. The findings suggest that only a few body related charac-

teristics are sufficient for screening purposes and for identifying patients who may belong to the discussed subgroup.

References

1. BLEULER E. Dementia praecox or the group of Schizophrenias (translated 1952 by NS KLINE). New York: International Universities Press, 1911.
2. HUBER G. Die coenästhetische Schizophrenie [Cenesthopathic Schizophrenia]. Fortschr Neurol Psychiatr 1957;**25**:491–520.
3. HUBER G. Die coenästhetische Schizophrenie als prägnanztyp schizophrener erkrankungen [Cenesthopathic schizophrenia as conciseness type of schizophrenia]. Acta Psychiatr Scand 1971;**47**:349–362.
4. HUBER G. Cenesthetic schizophrenia – a subtype of schizophrenia disease. Neurology, Psychiatry Brain Res 1992;**1**:54–60.
5. WORLD HEALTH ORGANISATION. The ICD-10 classification of mental and behavioural disorders. Geneva: Clinical descriptions and diagnostic guidelines, 1992.
6. AMERICAN PSYCHIATRIC ASSOCIATION. Diagnostic and statistical manual of mental disorders: DSM IV, 4th edn. Washington DC: American Psychiatric Association, 1997.
7. RÖHRICHT F, PRIEBE S. Störungen des Körpererlebens bei schizophrenen Patienten [Disturbances of body experience in schizophrenia patients]. Fortschr Neurol Psychiatr 1997;**65**:323–336.
8. SCHARFETTER C. Ego-psychopathology. The concept and it's empirical evaluation. Psychol Med 1981;**11**:273–280.
9. SCHARFETTER C. The self-experience of schizophrenics. Empirical studies of the ego/self in schizophrenia, borderline disorders and depression. Zürich: Private Publication, 1995.
10. DOLLFUS S, EVERITT B, RIBEYRE JM, ASSOULY-BESSE F, SHARP C, PETIT M. Identifying subtypes of schizophrenia by cluster analyses. Schizophr Bull 1996;**22**:545–555.
11. LASTRA I, VAZQUEZ-BARQUERO JL, HERRERA CASTANEDO S, CUESTA MJ, VAZQUEZ-BOURGON ME, DUNN G. The classification of first episode schizophrenia: a cluster-analytical approach. Acta Psychiatr Scand 2000;**102**:26–31.
12. RÖHRICHT F, PRIEBE S. Das Körpererleben von Patienten mit einer akuten paranoiden Schizophrenie – eine Verlaufsstudie [Body image in patients with acute paranoid schizophrenia. A longitudinal study]. Nervenarzt 1996;**67**: 602–607.
13. RÖHRICHT F. Körperschema, Körperbild und Körperkathexis in der akuten Schizophrenie [Body schema, body concept and body cathexis in acute schizophrenia]. In: RÖHRICHT, F, PRIEBE, S, eds. Körpererleben in der Schizophrenie [Body Experience in Schizophrenia]. Göttingen Bern Toronto Seattle: Hogrefe, 1998:91–104.
14. PRIEBE S, RÖHRICHT F. Specific body image pathology in acute schizophrenia. Psychiatry Res 2001;**101**:289–301.
15. GROSS G, HUBER G, KLOSTERKÖTTER J, LINZ M. BSABS. Bonner Skala für die Beurteilung Von Basissymptomen [Bonn Scale for the Assessment of Basic Symptoms]. Berlin, Heidelberg, New York: Springer, 1987.

16. KLOSTERKÖTTER J, EBEL H, SCHULTZE-LUTTER F, STEIN-MEYER EM. Diagnostic validity of basic symptoms. Eur Arch Psychiatry Clin Neurosci 1996;**246**:147–154.

17. KLOSTERKÖTTER J, GROSS G, HUBER G, WIENEKE A, STEINMEYER EM, SCHULTZE-LUTTER F. Evaluation of the 'Bonn Scale for the Assessment of Basic Symptoms – BSABS' as an instrument for the assessment of schizophrenia proneness: a review of recent findings. Neurology, Psychiatry Brain Res 1997;**5**:137–150.

18. ASKEVOLD F. Measuring body image: preliminary report on a new method. Psychother Psychosom 1975;**26**:71–77.

19. MEERMANN R. Körperschemastörungen [Body schema disturbances]. Habilitationsschrift: Medizinische Fakultät Universität Münster, 1985.

20. SLADE PD, RUSSELL GFM. Awareness of body dimensions in anorexia nervosa: cross-sectional and longitudinal studies. Psychol Med 1973;**3**:188–199.

21. BRÖKER M, RÖHRICHT F, PRIEBE S. Initial assessment of hospital treatment by patients with paranoid schizophrenia: a predictor of outcome. Psychiatry Res 1995;**58**:77–81.

22. PRIEBE S, BRÖKER M. Prediction of hospitalisations by schizophrenia patients'assessment of treatment: an expanded study. J Psychiatr Res 1999;**33**:113–119.

23. FISHER S. Body experience in fantasy and behaviour. New York: Appleton Century Crofts, 1970.

24. KAY SR, FISZBEIN A, OPLER LA. The positive and negative syndrome scale (PANSS) for schizophrenia. Schizophr Bull 1987;**13**:261–276.

25. KANE JM. Schizophrenia. N Engl J Med 1996;**334**:34–41.

26. SIMPSON GM, ANGUS JWS. A rating scale for extrapyramidal side effects. Acta Psychiatr Scand 1970;**45** (**Suppl. 212**):11–19.

27. RÖHRICHT F, PRIEBE S. Body image and anxiety in paranoid schizophrenia. In: COLUMBUS, F, ed. Advances in psychology research, Vol. 1. New York: Nova Science Publishers, 2000:127–133.

28. SIMS ACP. Towards the unification of body image disorders. Br J Psychiatry 1988;**153** (**Suppl. 2**):51–56.

29. MCGILCHRIST I, CUTTING J. Somatic delusions in schizophrenia and the affective psychoses. Br J Psychiatry 1995;**167**:350–361.

30. HEINROTH ICA. Lehrbuch der Störungen des Seelenlebens oder der Seelenstörungen und ihre Behandlung. Anhang 1825. Leipzig: Vogel, 1818.

31. SCHNEIDER K. Clinical psychopathology (translated by MW HAMILTON). New York: Grune & Stratton, 1959.

32. ANDREASEN NC, ARNDT S, ALLIGER R, MILLER D, FLAUM M. Symptoms of schizophrenia. Methods, meaning, mechanism. Arch General Psychiatry 1995;**52**:341–351.

33. GRUBE BS, BILDER RM, GOLDMAN RS. Meta-analysis of symptom factors in schizophrenia. Schizophr Res 1998;**31**:113–120.

34. CARPENTER WT, BARTKO JJ, LANGSNER CARPENTER C, STRAUSS JS. Another view of schizophrenia subtypes. Arch General Psychiatry 1976;**33**:508–516.

35. KRAEPELIN E. Psychiatrie. Ein Lehrbuch für Studierende und Ärzte. 7. Auflage [Psychiatry. A textbook for students and doctors]. Leipzig: Barth, 1913.

36. KAHLBAUM K. Über Heboidophrenie [About heboidophrenia]. Allgemeine Z Psychiatrie 1890;**46**:461–474.

37. LEONHARD K. Aufteilung der endogenen Psychosen und ihre differenzierte Ätiologie, [Classification of endogenous psychoses and their differentiating aetiology] 6. Auflage (1. Auflage 1957). Leipzig: Akademie, 1986.

38. BRÄUNIG P, KRUEGER S, ROMMEL O, BÖRNER I. Zönästhetische Schizophrenien [Coenaesthetic Schizophrenia]. Schweiz Arch Neurol Psychiatr 2000;**151**:16–21.

39. LEONHARD K. Review. Das Körperschema bei Psychosen. Zentralblatt Neurologie Psychiatrie 1988;**250**:521–526.

40. KLOSTERKÖTTER J, HELLMICH M, STEINMEYER EM, SCHULTZE-LUTTER F. Diagnosing schizophrenia in the initial prodromal phase. Arch General Psychiatry 2001;**58**:158–164.

41. MCGORRY PD, PHILLIPS L, CRUMP N, YUNG A, ADLARD S, MCDONALD A. Predicting early transition to psychosis in young people at high risk. Current Opinion Psychiatry 1999;**12** (**Suppl. 1**):254.