The Canadian Journal of Psychiatry

Volume 51 | Ottawa, Canada, May 2006 | Number 6

Original Research

Characterization of the Facial Expression of Emotions in Schizophrenia Patients: Preliminary Findings With a New Electromyography Method

Karsten Wolf, MD[1], Reinhard Mass, PhD[2], Falk Kiefer, MD[3], Klaus Wiedemann, MD[4], Dieter Naber, MD[4]

Objective: We investigated facial expression of emotions (FEE) in schizophrenia patients, using an improved and highly selective facial electromyography (EMG) method, and we examined the correlation between FEE and psychopathology.

Method: We compared unmedicated patients with schizophrenia (n = 32) with healthy subjects (n = 21) with regard to the activity of 3 joy-relevant facial muscles (the M.zygomaticus, the M.orbicularis oculi, and the M.levator labii). Emotions were induced by pictures from the International Affective Picture System. We measured previsible muscle activity with a new, highly selective facial EMG. We used the Positive and Negative Syndrome Scale to evaluate psychopathology.

Results: Patients with schizophrenia showed fewer joy or smile reactions than did control subjects and displayed decreased activity of the M.orbicularis oculi and M.zygomaticus under presentation of positive pictures. Reduced activity of these muscles can be caused by depression. Increased activity of the M.levator labii correlates with positive symptoms.

Conclusions: Our findings indicate that psychopathological syndromes correlate with schizophrenic mimic disturbances. These results can be used to compare various antipsychotics with regard to their influence on mimic disturbances.

(Can J Psychiatry 2006;51:335–341)

Information on funding and support and author affiliations appears at the end of the article.

Clinical Implications

- Schizophrenia is a disease that causes great damage to the individuals affected and to the national economy.
- An adequate facial expression is essential for bonding and for human relationships.
- Bonding and human relationships of schizophrenia patients have an impact on social outcome, course, and prognosis of the disease.

Limitations

- The stimuli allow a good standardized setting but do not yet allow a generalization of the results to the concept of joy.
- Because of the pilot character of the study, we did not examine other specific factors and epiphenomena that may affect muscle reactivity.

Key Words: *facial expression of emotions, mimic disturbance, psychopathology*

For a long time, clinical observations suggested a lack of facial expressiveness in patients with schizophrenia. Further, occasional bizarre facial movements were already described by Kraepelin (1) and later defined as "mimic disintegration" by Heimann (2) and Spoerri (3) on the basis of systematic observation. Heimann and Spoerri describe the term "mimic desintegration"(in German, *Mimische Desintegration*) as mimic patterns that cannot obviously be assigned to any known productive expression, and an "impression of not belonging together and of alterations" (2, p 1128) is conveyed to the observer.

Since Ekmans work, these mimic disturbances can be investigated empirically. Ekman postulates 6 basic emotions expressed through specific facial movements. They can be identified with a video-based analyzing system called the FACS (4). These 6 emotions are joy, disgust and contempt, aggression, sorrow, surprise, and anxiety. Each emotion is characterized by a specific pattern of "action units," which are based on specific patterns of facial muscle activity. Integrated and organized mimic reactions in general are of great importance for social relations, with smiling being a key player in the expression of joy. There are at least 3 types of smiles (5–7): the "felt smile" (caused by activation of M.zygomaticus plus M.orbicularis oculi), the social smile (activation of M.zygomaticus alone), and the masking smile of the disgust or contempt type (caused by activation of M.zygomaticus plus M.levator labii). However, Ekman's method of measuring visible movements is limiting, and even microcomputer-based methods (8–10) do not solve these limitations.

Abbreviations used in this article

CMRR	common mode rejection ratio
COG	cognitive syndrome
CON	control
DEP	depression
EMG	electromyography
EPS	Extrapyramidal Side Effects Scale
EXC	hostile excitement
FACS	Facial Action Coding System
FEE	facial expression of emotions
IAPS	International Affective Pictures Scale
NEG	negative syndrome
NS	not significant
PANSS	Positive and Negative Syndrome Scale
POS	positive syndrome
SCH	schizophrenia
SD	standard deviation

Modern EMG techniques provide a more precise measurement of the entire muscle activity, including the important previsible facial muscle actvity. Dimberg (11–14) was the first to prove the validity of the EMG method by matching EMG data to certain kinds and intensities of emotions. In addition, he was able to show the existence of "rapid facial reactions" (14).

However, all EMG methods applied thus far fail to reach sufficient levels of both sensitivity and selectivity. In this context, selectivity means the ability of an EMG method to isolate the facial muscle targeted for measurement. Altogether, the more sensitive an EMG, the less selective it tends to be. For this reason, all previous EMG studies were unable to measure more than 2 to 3 facial muscles simultaneously.

A new EMG method has become available, offering sensitivity and selectivity at the same time. The new method facilitates the simultaneous measurement of 9 facial muscles. The validity of this method was recently established in 2 studies of healthy subjects (15,16).

This study aimed to use this improved EMG method to identify the well-known and indisputable mimic disturbances of unmedicated schizophrenia patients.

Unmedicated schizophrenia patients show a reduced frequency of joy (7,17), a preponderance of negative emotions (18), and a reduced mimic activity, especially of the upper face (19). In contrast, schizophrenia patients in remission show a reduced mimic activity, especially of the lower face (20). One study investigated an increased activity of the area around the nose, caused by the M.levator labii (21). A recent study investigated a reduced facial activity, especially in the upper face in acute schizophrenia patients and a stability of this pattern in the acute illness course and in remitted schizophrenia patients (22). EMG studies measuring the activity of M. zygomaticus and M. corrugator found a reduced activity of the smile muscle, M. zygomaticus, in unmedicated schizophrenia patients (19,23,24)

Methods

Subjects

The sample group comprised 32 inpatients with schizophrenia (DSM-IV 295, SCH) and 21 healthy control subjects (CON). Of the SCH group, 28 were first-episode patients, 3 were second-episode patients, and 1 was a fourth-episode patient. The current evaluation is part of an ongoing extensive project about the longitudinal course of FEE in schizophrenia patients. Patients met DSM-IV criteria for schizophrenia (25) and had no other current diagnosis. All were inpatients, tested on the first day after admission. None of the patients had

received any antipsychotic medication for at least 1 month and (or) benzodiazepines for at least 3 half-life periods of the respective compound. Patients had to be without any other psychotropic medication or substances for at least 3 months.

The healthy control subjects had never suffered from any psychiatric illness, had no family history of psychiatric disturbances, and had not received any psychotropic substances for at least 3 months (see Table 1 for sample characteristics). The study was approved by the local ethics committee of the University of Hamburg, and written informed consent was obtained from all participants prior to the study.

Induction of Emotions

All subjects were tested under video observation in an electrically shielded, soundproof chamber with reduced light, sitting in a comfortable chair. All tests were scheduled between 1 PM and 3 PM. Subjects were allowed to adapt to the surroundings in the room for 30 minutes prior to testing, while being asked about their present psychosocial situation. Afterwards, subjects were asked to relax, look at the presented pictures, and refrain from voluntary movement of the body, head, or face. Then, the patients and the healthy subjects were exposed to slides with neutral, joyful, and sad stimuli. The exposure time (10 seconds per picture) was controlled electronically. The first picture, before the stimulus slides were shown, was a grey baseline picture presented for 2 minutes, which induced a relaxed psychophysiological state.

For testing, we chose 11 pictures from the IAPS, with different series for women and men to acknowledge sexual preferences. Each picture was preceded by a grey baseline picture (presentation time 15 seconds). Two neutral pictures were followed by a picture of flowers and a picture of a landscape, from which we expected the emotion of relaxed joy. Then, we presented an erotic picture of a single person, followed by an erotic picture of a couple, presuming the emotion of joy plus arousal for both pictures, on the basis of the results of IAPS research by Lang (26). After showing 2 pictures, one with a family and the second with a child, we presented one picture with sad content as a control picture. Finally, the landscape picture and the erotic picture of a single person were presented again. The results are based on the analysis of the following pictures: for women, IAPS number 8041(T0), number 4510 (T1), and number 4533 (T2); and for men, IAPS number 4180 (T0), 4210 (T1), and 4220 (T2). We chose these pictures because of their proven effect to induce joy (26).

EMG Measures

We used a modified EMG device (that is, the Advanced Emotion Finder, Hamburg/Karlsruhe, 2000), based on the Varioport system (Becker MEDITEC, Karlsruhe, Germany, 2000), without relevant interference among muscles, that allows a high selectivity and therefore a sufficient discrimination among muscles close to one another. Bipolar EMG recordings were taken from the left M. frontalis medialis, M. corrugator supercilii, M. orbicularis oculi, M. levator labii, and M. zygomaticus region on the face, with Hellige miniature surface Ag/AgCl electrodes (inside diameter 0.6 cm) filled with Med-Tek/Synapse conductive electrode cream. The electrodes were placed according to the recommendations of Fridlund and Cacioppo (27). The interelectrode distances were 12 mm. Skin was prepared by abrasion with 70% clinical alcohol first and then Hellige Epicont abrasive skin preparation cream. The electrodes were connected to Advanced Emotion Finder Amplifiers, and the raw EMG signal was analyzed automatically by a 2-channel contour-following integrator (Advanced Emotion Finder, Hamburg, Germany, 2000) as follows: frequency range (3 dB) of 90 to 500 Hz with a time constant of 0.0018 s, amplification factor 5000 (± 2%), common mode rejection ratio (77 dB at 50 Hz, time constant of integrator 0.1 s, range ± 250 μV, resolution of AD-Converter 12 Bit (= 4096 steps), resolution of signal 0.122 μV per step. The input impedance is theoretically 1Gohm; owing to our cable capacities, it is about 500 Mohm at 50 Hz. The sampling rate was 32 Hz. The output signals were recorded and stored in computer files (Variograph software on a Macintosh Power book, Becker MEDITEC, Karlsruhe, Germany, 2000) for off-line analysis. With the help of video recordings, the complete EMG data were screened for artifacts like eye blinking. Artifacts were interpolated with the Variograph software (Becker MEDITEC, Karlsruhe, Germany, 2000).

Psychopathological Symptoms

The patient's psychopathological status was determined with the PANSS (28). Extrapyramidal symptoms were evaluated with the EPS (29). For the present analyses, we considered 5 syndromes yielded by factor analysis underlying the 30 PANSS items (30): POS, items P1, P3, G9; NEG, items N4, N2, N1, N3, G16, N6; COG, Items N5, G11, P2; DEP, items G6, G2, G3; and EXC, items P7, P4, G14, G4, G8, P5, G5.

Statistical Analyses

The statistical analysis is based on the activities of the 3 joy-relevant muscles (that is, the M.zygomaticus, the M.orbicularis oculi, and the M.levator labii) and on the presentation of the positive picture.

As our EMG baseline value, we established the average of the measures obtained during the last 3 seconds of the 15-second presentation of the grey picture shown before each IAPS stimulus. As the trial phase, we used the 10-second presentation of the IAPS stimulus.

We defined "facial muscle reaction" as an increase in mean muscular voltage during the trial (that is, during the picture

Table 1 Sample characteristics, PANSS syndrome ratings

	Schizophrenia group (n = 32)	Control group (n = 21)
Age[a], mean (SD)	31.8 (9.0)	25.2 (3.2)
Duration of illness,[a,c] mean (SD)	3.3 (5.1)	—
ICD-10 diagnosis	F20.0	—
	n (%)	
Sex: male	16 (50.0)	7 (33.3)
Educational level		
No degree	1 (3.1)	0 (0)
Elementary school	6 (18.8)	0 (0)
Middle school	9 (28.1)	0 (0)
High school[b]	16 (50.0)	21 (100) (12 students, 9 clinic staff)
First-episode patients	28 (87.5)	—
Second-episode patients	3 (9.4)	—
≥ 3 episodes patients	1 (3.1)	—
	Mean (SD), range	
PANSS positive syndrome	2.42 (1.23), 1.00–4.67	—
PANSS negative syndrome	1.87 (0.75), 1.00–3.67	—
PANSS cognitive syndrome	2.18 (0.88), 1.00–4.00	—
PANSS depressive syndrome	2.37 (1.05), 1.00–5.33	—
PANSS excitement syndrome	1.58 (0.45), 1.00–3.00	—

[a]In years
[b]Qualifying for entrance to university
[c]Age at time of age at investigation minus age at first prodromal sign
— = no data

exposition). The increase had to be greater than the mean value of the preceding baseline plus 2 baseline SDs. A "smile response" was defined as a reaction of the M. zygomaticus major alone or in combination with a reaction of the M. levator labii and (or) the M. orbicularis oculi.

To calculate changes of facial muscle activity, we determined the difference between mean voltage observed during the trial and mean voltage observed during baseline.

All statistical analyses were conducted with the Statistical Package for the Social Sciences (Version 6.1.1, for Macintosh 1999). We tested baseline-to-trial changes of muscular activity (the averaged mean) with paired t tests for both groups and within the groups for each muscle, separately. We tested group differences of smile response frequencies with chi-square tests. To examine the relation between facial muscular reactions and psychopathologic symptoms, we calculated parametric correlation coefficients (r_{yx}) for the patients with schizophrenia.

To test the hypotheses, we accepted P values of 0.05, 0.01, and 0.001 as nominal levels of significance, high significance and very high significance, respectively. Hypothesis testing was 2-tailed.

Because we wanted to use the original scales of the single PANSS items (rated from 1 = nonexistent to 7 = extreme) for an interpretation of the PANSS syndromes, we calculated the arithmetic medium instead of the sum score when describing the syndromes. The highest means were observed for the POS and DEP syndromes, respectively; the lowest mean was observed for the EXC syndrome (Table 1).

Results

Table 2 shows the EMG measurement results from both test groups. We included 3 facial muscles in this study.

Table 2 Comparisons (paired *t* tests) of averaged mean and maximum EMG measures obtained during baseline and trial conditions, respectively

Group	Baseline average (mV)	Trial average (mV)	Significance (2-tailed)
Schizophrenia			
M.orbicularis (mean)	1.37	2.74	$P < 0.05$
M. orbicularis (maximum)	3.56	10.00	$P < 0.05$
M. levator (mean)	2.90	5.10	ns
M. levator (maximum)	5.48	11.97	$P < 0.1$
M. zygomaticus (mean)	7.26	8.49	ns
M. zygomaticus (maximum)	11.26	17.40	ns
M.orbicularis (mean)	0.27	2.08	$P < 0.01$
M. orbicularis (maximum)	1.37	6.03	$P < 0.05$
Healthy control subjects			
M. levator (mean)	1.10	3.45	$P < 0.05$
M. levator (maximum)	2.74	8.63	$P < 0.05$
M. zygomaticus (mean)	4.66	8.82	$P < 0.05$
M. zygomaticus (maximum)	6.14	19.10	$P < 0.05$

In the CON group, all muscles showed significant increases in muscular tension from baseline to trial (using paired *t* tests). In contrast to these results, the SCH group showed significant changes for the M. orbicularis oculi only and marginal changes for the M. levator labii. Patients with schizophrenia showed significantly fewer smile responses: SCH, 7 smiles (21.9%) and 25 nonsmiles (78.1%); CON, 12 smiles (57.1%) and 9 nonsmiles (42.9%) ($\chi^2 = 6.86$, df 1; $P < 0.01$).

Table 3 shows the correlation between changes in facial muscle activity and PANSS syndromes, as calculated for the SCH group. We found a positive correlation between muscle activity changes and the POS syndrome: Positive symptoms were accompanied by an increase of muscular activity from baseline to trial. Further, the DEP syndrome correlated inversely with changes of facial muscle activity: depressive patients showed fewer muscle activity changes than did nondepressive patients. The negative syndrome correlated inversely with M. orbicularis oculi activity. The entire group of unmedicated schizophrenia patients showed no changes regarding the EPS.

Discussion

This present study measures previsible activity of 3 joy-relevant facial muscles (the M. orbicularis oculi, the M. levator labii, and the M. zygomaticus), using a new EMG method that reaches sufficient levels of sensitivity and selectivity at the same time. The validity of this method was established in a recent study of healthy subjects, in which 9 facial muscles were measured simultaneously (15). IAPS pictures (26) with joyful content were presented in a standardized setting.

When we applyed this EMG method, unmedicated schizophrenia patients showed distinct mimic reactions that correlated with the content of the presented IAPS pictures. Regarding FEE, considerable differences between schizophrenia patients and healthy control subjects could be detected.

In general, unmedicated schizophrenia patients showed fewer smile reactions than did control subjects. This fact is already well established and undisputed (7,17,18,23,24).

In our tests, we could not detect any motor dysfunction, according to Simpson-Angus scale results (29), in any of the schizophrenia patients. Therefore, it has to be presumed that the causes for reduced FEE cannot be attributed to physiological muscle changes. It remains unclear whether these mimic disturbances in schizophrenia patients are based on a dysfunction of the primary human emotion system or whether they are caused by a malfunction of eye tracking. Most importantly, our results generally match those of other, earlier studies, which confirms the validity of our method.

Further, we found an interesting correlation between FEE and psychopathology. In particular, the correlation between FEE and the DEP and NEG syndromes suggests that reduced smile activity is caused by the depressive syndrome. Ellgring found a reduced smile frequency in depression patients analogous to patients with schizophrenia (31). He also found that there was a correlation between a general improvement and an increase

Table 3 Pearson correlations (significance) between facial muscle tension changes and PANSS syndromes, schizophrenia sample (n = 32); 2-tailed

	M. orbicularis oculi	M. levator labii	M. zygomaticus major
PANSS positive syndrome	0.39*	0.30**	0.42*
PANSS negative syndrome	–0.36*	–0.24	–0.26
PANSS cognitive syndrome	–0.00	0.06	0.06
PANSS depressive syndrome	–0.36*	–0.34**	–0.33**
PANSS excitement syndrome	0.00	0.09	0.05

*P < 0.05; **P < 0.1

in smile reactions. These results were independent from the etiology, and therefore similar in depression and schizophrenia patients.

Another important finding of our study is the correlation between the POS syndrome and the increase in M. levator labii activity. With the use of the FACS, Steimer-Krause measured an increased activity of Action Unit 9 in patients with schizophrenia (21). Action Unit 9 activity is caused by the activity of M. levator labii and—according to Ekman and Friesen (4–6)–is an expression of disgust or contempt. Steimer–Krause believes this finding to be specific for schizophrenia patients and discusses it as a protection against closeness. We disagree, since the previsible activity of the M. levator labii, when measured with a facial EMG method such as ours, is not a specific expression of disgust, as proven in a recent study (15).

One possible explanation for the correlation of the positive syndrome and the increased activity of the M. levator labii superioris might be the mimic disintegration, as proposed by Heimann and Spoerri (2,3). They investigated whether it is possible to identify mimic disintegration in unmedicated schizophrenia patients. Mimic disintegration is defined as the inability to organize the singular facial muscle movements in such a way that they present an integrated whole. Mimic disintegration makes it difficult for observers to decode the emotional state, since these facial actions seem indecipherable and bizarre. Without a sufficient decoding of the emotional state of the person in front of you, it is difficult to establish contact or to develop a deeper relationship with him or her. The link between mimic disintegration and M.levator labii activity was further supported by another recent study (32).

To understand these results in depth, it is necessary to collect larger samples, to distinguish between the different types of smiles, and to further investigate the correlation between mimic disintegration and psychopathology. To understand the etiology of the reduced FEE, it would also be necessary to include eye tracking. Our present results recommend further studies of schizophrenia patients, especially in regard to the positive and negative syndromes, using an EMG method that allows the simultaneous measurement of up to 10 facial muscles. Such a broad measurement would allow the analysis of other emotions like appetence, disgust, pain, or fear—emotions that might be affected in schizophrenia patients as well. In this context, studies comparing the effect of antipsychotics are of great importance, since the effects of antipsychotics on FEE are largely unknown.

Funding and Support

This study received no funding or support.

References

1. Kraepelin E. Psychiatrie: ein lehrbuch für studierende und ärzte. Leipzig: Barth; 1883.
2. Heimann H, Spoerri T. Das ausdruckssyndrom der mimischen desintegrierung bei chronischen schizophrenen. Schweiz Med Wochenschr 1957;Suppl:1126–32.
3. Heimann H. Die quantitative analyse mimischer bewegungen und ihre anwendung in der pharmako-psychiatrie. Arzneimittelforschung 1966;16:294–7.
4. Ekman P, Friesen WV. The Facial Acting Coding System: a technique for the measurement of facial movement. Palo Alto (CA): Consulting Psychologists Press; 1978.
5. Ekman P. Darwin and facial expression. New York: Academic Press; 1973.
6. Ekman P. Emotion in the human face. 2nd ed. Cambridge: University Press; 1982.
7. Baenninger-Huber E. Mimik – übertragung – interaktion: die untersuchung affektiver prozesse in der psychotherapie. Bern: Huber; 1996.
8. Katsikitis M. The quantification of smiling using a microcomputer-based approach. Journal Of Nonverbal Behaviour 1990;14:3–17.
9. Pilowsky I, Katsikitis M. The classification of facial emotions: acomputer-based taxonomic approach. J Affect Disord 1994; 30:61–71.
10. Thornton M, Pilowsky I. Facial expressions can be modelled mathematically. Br J Psychiatry Psychiatry 1982;140:61–3.
11. Dimberg U. Facial reactions to facial expressions. Psychophysiology 1982;19:643–7.
12. Dimberg U. Facial electromyography and the experience of emotion. Psychophysiology 1988;3:277–82.
13. Dimberg U. Facial electromyography and emotional reactions. Psychophysiology 1990;27:481–94.
14. Dimberg U. Rapid facial reactions to emotional facial expressions. Scand J Psychol 1998;39:39–45.
15. Wolf K, Mass R, Kiefer F, Naber D, Wiedemann K. The facial pattern of disgust, appetence, excited joy and relaxed joy – an improved facial EMG study. Scand J Psychol 2005; 46:403–9.
16. Wolf K, Mass R, Kiefer F, Naber D, Wiedemann K. The face of pain – a pilot study to validate the measurement of facial pain expression with an improved electromyogram method. Pain Res Manag 2005;10:15–9.

17. Colby CZ, Lanzetta JT, Kleck RE. Effects of the expression of pain on autonomic and pain tolerance responses to subject-controlled pain. Psychophysiology 1996;14:537–40.
18. Scherer KR. On the nature and function of emotion: acomponent process approach. In: Scherer KR, Ekman P, editors. Approaches to emotion. Hillsdale (NY) : Lawrence Erlbaum; 1984.
19. Scherer K. Theorien und aktuelle probleme der emotionspsychologie. In: Scherer KR, editor. Psychologie der emotionen. Göttingen: Hogrefe; 1990.
20. Mattes RM, Schneider F, Heimann H, Birbaumer N. Reduced emotional response of schizophrenic patients in remission during social interaction. Schizophr Res 1995;17:249–55.
21. Steimer-Krause E. Interaction regulations used by schizophrenic and psychosomatic patients: studies on facial behaviour in dyadic interactions. Psychiatry 1990;53:209–28.
22. Gaebel W. Facial expressivity in the course of schizophrenia and depression. Eur Arch Psychiatry Clin Neurosci 2004;254:335–42.
23. Kring AM, Neale JM. Do patients with schizophrenia show a disjunctive relationship among expressive, experimental and psychophysiological components of emotion? J Abnorm Psychol 1996;105:249–57.
24. Schneider F, Ellgring H, Friedrich J, Fus I, Beyer T, Heimann H. The effects of neuroleptics on facial action in patients with schizophrenia. Pharmacopsychiatry 1992;25:233–9.
25. American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 4th ed. Washington (DC): APA; 1994.
26. Lang P. Looking at pictures: affective, facial, visceral, and behavioral reactions. Psychophysiology 1993;30:261–73.
27. Fridlund AJ, Cacioppo JT. Guidelines for human electromyographic research. Psychophysiology 1986;23:567–89.
28. Kay SR, Fiszbein A, Opler LA. The Positive and Negative Syndrome Scale (PANSS) for schizophrenia. Schizophr Bull 1987;13:261–7.
29. Simpson GM, Angus JWS. A rating scale for extrapyramidal side effects. Acta Psychiatrica Scand 1970;Suppl(212):11–9.
30. Mass R, Schömig T, Hitschfeld K, Wall E, Haasen C. Psychopathological syndromes of schizophrenia. Evaluation of the dimensional structure of the Positive and Negative Syndrome Scale (PANSS). Schizophr Bull 2000;26:167–77.
31. Ellgring D. Nonverbal communication in depression. Cambridge: Cambridge University Press; 1989.
32. Wolf K, Köppel S, Maß R, Naber D. Bestätigung des Heimann'schen konzeptes zur mimischen desintegration schizophrener patienten mittels einer neuen Gesichts-EMG Methode. Nervenarzt 2005;76:1103–8.

Manuscript received February 2005, revised, and accepted February 2006.
[1]Psychiatrist and Psychotherapist, Department of Psychiatry and Psychotherapy, University Hospital of Hamburg, Hamburg, Germany; Center of Mental Health Marienheide, Marienheide, Germany.
[2]Professor and Clinical Psychologist, Department of Psychiatry and Psychotherapy, University Hospital of Hamburg, Hamburg, Germany; Center of Mental Health Marienheide, Marienheide, Germany.
[3]Professor, Department of Psychiatry and Psychotherapy, University Hospital of Hamburg, Hamburg, Germany; Professor, Department of Addictive Behaviour and Addictive Medicine, Central Institute of Mental Health, University of Heidelberg, 68159 Mannheim, Germany.
[4]Professor, Department of Psychiatry and Psychotherapy, University Hospital of Hamburg, Hamburg, Germany.
Address for correspondence: Dr K Wolf, MD, Center of Mental Health Marienheide,Leppestr 65-76, 51709 Marienheide, Germany; karsten.wolf@kkh-gummersbach.de

Résumé : La caractérisation de l'expression émotionnelle du visage chez des patients souffrant de schizophrénie : observations préliminaires avec une nouvelle méthode d'électromyographie

Objectif : Nous avons étudié l'expression émotionnelle du visage (EEV) chez des patients souffrant de schizophrénie, à l'aide d'une technique d'électromyographie (EMG) faciale améliorée et très sélective, et nous avons examiné la corrélation entre l'EEV et la psychopathologie.

Méthode : Nous avons comparé des patients non médicamentés souffrant de schizophrénie (n = 32) avec des sujets en santé (n = 21) en ce qui concerne l'activité de 3 muscles faciaux liés à la joie (le muscle grand zygomatique, le muscle orbiculaire et le muscle releveur de la lèvre). Les émotions ont été provoquées par des images du système international d'images affectives (IAPS). Nous avons mesuré l'activité musculaire prévisible au moyen d'une nouvelle EMG faciale très sélective. Nous avons utilisé l'échelle de syndrome positif et négatif (PANSS) pour évaluer la psychopathologie.

Résultats : Les patients souffrant de schizophrénie ont eu moins de réactions joyeuses ou souriantes que les sujets témoins et ont démontré une activité moindre du muscle orbiculaire et du muscle grand zygomatique devant les images positives présentées. L'activité réduite de ces muscles peut être causée par la dépression. L'activité accrue du muscle releveur de la lèvre est en corrélation avec les symptômes positifs.

Conclusions : Nos observations indiquent que les syndromes psychopathologiques sont en corrélation avec les anomalies mimiques schizophrènes. Ces résultats peuvent servir à comparer divers antipsychotiques relativement à leur influence sur les anomalies mimiques.