Psychiatria Danubina, 2015; Vol. 27, No. 4, pp 364-370 *Original paper*

TREATMENT EFFECTIVENESS IN PATIENTS WITH SCHIZOPHRENIA AS MEASURED BY THE ASSESS BATTERY - FIRST LONGITUDINAL DATA

Maria Ladea[1], Cristina M. Barbu[2] & Georg Juckel[3]

[1]*"Prof. Dr. Al. Obregia" Clinical Hospital of Psychiatry, "Carol Davila" University of Medicine and Pharmacy, Bucharest, Romania*

[2]*"Prof. Dr. Al. Obregia" Clinical Hospital of Psychiatry, Bucharest, Romania*

[2]*Department of Psychiatry, LWL-University Hospital, Ruhr-University Bochum, Germany*

received: 17.6.2015; revised: 27.7.2015; accepted: 17.8.2015

SUMMARY

Background: *Effective pharmacological treatment with a favorable side-effect profile increases treatment adherence and is therefore very important for patients with schizophrenia. Psychiatrists need easy to use and reliable assessments instruments to evaluate treatment effectiveness in their patients.*

Subjects and methods: *A group of European leading psychiatrists have proposed a framework for the assessment of treatment effectiveness in patients with schizophrenia - the ASSESS battery (The ASseSsment of EffectivenesS in Schizophrenia Battery) which evaluates the effectiveness of treatment during both the remission and the relapse periods. ASSESS includes: 10 items of Positive and Negative Symptoms Scale (PANSS), Brief Assessment of Cognition in Schizophrenia (BACS), Medication Satisfaction Questionnaire (MSQ), and Personal and Social Performance Scale (PSP). The battery assesses five domains: symptomatic remission and retention of treatment, affective symptoms, cognitive functioning, treatment satisfaction and personal and social functioning. The aim of the present study was to evaluate the applicability of ASSESS in real world practice.*

Results: *The variations of the PANSS items rated during the study indicate a significant improvement of psychopathology. A similar improvement was observed in cognition, social functioning and treatment satisfaction as shown by BACS, PSP and MSQ scales. Cognitive impairment, personal and social functioning, and treatment satisfaction were correlated with the remission or augmentation of positive symptoms.*

Conclusions: *This pilot study revealed that ASSESS is easy to apply in clinical practice and is a suitable tool for psychiatrists since it covers all the relevant aspects of the course of schizophrenia in a compact form.*

Key words: *ASSESS battery – schizophrenia - assessment*

* * * * *

INTRODUCTION

For patients with schizophrenia it is very important to benefit from effective pharmacological treatment, with a favorable side-effect profile, ensuring adherence to the treatment. Consequently the periods of good symptom control can be prolonged and the risk of relapse can be reduced (Hartling et al. 2012). The treatment of schizophrenia has substantially evolved in recent decades, with improvements in pharmacological interventions such as the introduction of second generation antipsychotics which generally have fewer side effects, especially regarding EPMS movement disorders (Juckel & Morosini 2008). The treatment of the positive symptoms of schizophrenia has many drug options available, but there are fewer options for negative and cognitive symptoms (Walters & Agius 2014). In the last years, the goal of successful treatment moved beyond symptom remission toward recovery (Leucht & Lasser 2006). Remission in schizophrenia was defined as a state in which patients have experienced an improvement in core signs and symptoms, and that any remaining symptoms are of sufficiently low intensity that they no longer interfere significantly with behavior. The symptoms are also below the threshold typically utilized in justifying an initial diagnosis of schizophrenia (Andreasen et al. 2005). Symptom remission alone is not sufficient when defining recovery in schizophrenia. The psychosocial functional level in areas like work, school, interpersonal relations, or self-care is also included in definitions of recovery (Liberman & Kopelowicz 2005).

In clinical practice, psychiatrists are still facing the challenge of selecting the most appropriate pharmacological treatment strategy for their patients (Leucht et al. 2009). Large-scale naturalistic effectiveness studies, such as Clinical Antipsychotic Trials of Intervention Effectiveness (Lieberman et al. 2005), European First Episode Schizophrenia Trial (Fleischhacker et al. 2005) and Cost Utility of the Latest Antipsychotic Drugs in Schizophrenia Study (Jones et al. 2006) have demonstrated significant differences in all-cause discontinuation of antipsychotic medication. Also, despite treatment evolution, the cognitive dysfunction and psychosocial functioning show only modest improvement with currently available therapies and the majority of patients treated with second-generation antipsychotic drugs continue to experience significant cognitive disability (Burns

& Patrick 2007). Cognitive impairment associated with schizophrenia is viewed as a potential target for psychopharmacological treatment (Schennach-Wolff et al. 2009).

Since effectiveness is a holistic notion, defining it might prove difficult. Therefore numerous factors may be used to assess treatment effectiveness over short- and long-term periods. Effectiveness was defined as the ability of an intervention to produce the desired beneficial effect in actual usage. Psychiatrists must consider the relevance of each of these factors in assessing effectiveness in specific populations of patients, since those factors considered appropriate for patients during the acute phase may be less applicable to stable or chronic patients. Moreover, a way of solving clinical heterogeneity is to 'stage' the longitudinal trajectories in order to optimize the treatment. Thus, psychiatrists need easy to use and reliable assessments instruments to evaluate treatment effectiveness in their patients. Effectiveness has been explained as improvement in four domains: symptoms of disease (measured by using symptom scales), treatment burden (measured by using adverse event scales), disease burden (assessed by interview with patients and families), and health and wellness (measured by using quality of life scales) (Nasrallah et al. 2005). However, some aspects of the conceptualization as well as the real world clinical application of this consensus are unclear.

A group of European leading psychiatrists have proposed a framework for the assessment of treatment effectiveness in patients with schizophrenia - the ASSESS checklist (Juckel et al. 2014). ASSESS (The ASseSsment of Effectiveness in Schizophrenia Checklist) evaluates the effectiveness of treatment during the remission/recovery as well as during the relapse periods, and the results can be correlated with the therapeutic outcome. It is important for clinical practice that all the included assessments can be performed in approximately one hour. This framework consists of five domains: (1) symptomatic remission and retention of treatment, (2) affective symptoms, (3) cognitive functioning, (4) treatment satisfaction and (5) personal and social functioning, which are measured by the careful selection of a specific scale or parts of such a scale for each domain. The aim of this approach is to promote a patient-centered evaluation for the assessment of the treatment effectiveness in patients with schizophrenia and to provide clinically applicable scales for each domain, scales that are appropriate for everyday practice.

Since the ASSESS battery has not yet been validated, we present data from a pilot study. This research represents the first application of the battery in a longitudinal natural observational study in a Romanian group of patients with schizophrenia. The aim of the study was to evaluate the applicability of this battery in real world practice as well as to collect data about treatment effectiveness and the course of schizophrenia by monitoring patients in an outpatient setting attached to an inpatient service.

SUBJECTS AND METHODS

Subjects

In this observational study 32 male patients, diagnosed with schizophrenia according to Diagnostic and Statistical Manual of Mental Disorders 4th Edition Text Revision (DSM IV TR) were evaluated. One female was included in the study but she was excluded from statistical analysis for gender homogeneity reasons. Patients were selected from the 3rd Ward of "Al. Obregia" University Hospital of Psychiatry, Bucharest, Romania and were included and followed over a total period of 3 years. Each patient was followed over 12 months.

The patients were included either in the acute phase as inpatients or in remission as outpatients. Therefore, the patients followed treatment either as inpatients or outpatients, and all were adherent to the treatment to a certain degree, that is they did not totally stop treatment. The relapse of some patients that underwent three (or more) visits was due to: reduction of the medication dosage, alcohol abuse, and modification of treatment due to administrative issues (such as lack of availability). At visit 1 there were 28 patients in acute phase and 4 in remission; at visit 2 there were 9 acute patients and 14 in remission and at visit 3 there were 2 acute patients and 9 in remission phase.

All the patients were on antipsychotic treatment. During the 1 year follow-up some patients had their treatment changed due to various factors (partial adherence, administrative issues) and they received more than one treatment during the evaluation period of one year, as shown on Table 1.

The patients also received adjuvant treatment with antidepressants, mood stabilizers or benzodiazepines during the study as follows: at visit 1 one patient received antidepressants, 11 patients received mood stabilizers and 21 received benzodiazepines; at visit 2 five patients received mood stabilizers and 12 benzodiazepines; at visit 3 one received antidepressants, 2 patients received mood stabilizers and 4 received benzodiazepines.

Assessments

A single trained psychiatrist and a back-up rater performed all of the assessments.

The ASSESS battery was used to assess 32 patients at visit 1, 23 patients at visit 2 and 11 patients at visit 3. The ASSESS battery was applied in remission as well as relapse periods of the included patients.

The mean interval between visit 1 and visit 3 was 6 months. Since at visit 4 and 5 less than 10 patients were assessed no statistical analysis was completed for these visits, due to the small sample.

The ASSESS battery evaluates impaired domains of the patient with schizophrenia: symptoms relevant for symptomatic remission, affective symptoms, cognitive functioning, medication satisfaction and personal and social functioning.

Table 1. Antipsychotic treatment

	Risperidone	Olanzapine	Quetiapine	Aripiprazole	Clozapine	Amisulpride	Quetiapine + Aripiprazole	Quetiapine + Amisulpride
V1	10/32	5/32	8/32	2/32	4/32	6/32	0	3
V2	7/23	3/23	6/23	2/23	3/23	4/23	1	3
V3	2/11	2/11	2/11	2/11	1/11	2/11	0	0

V1 - visit 1; V2 - visit 2; V3 – visit 3

Symptomatic remission was defined as a score of ≤3 for all following Positive and Negative Symptoms Scale (PANSS) items: delusions, unusual thought content, hallucinatory behavior, conceptual disorganization, mannerisms/posturing, blunted affect, social withdrawal, lack of spontaneity. Affective symptoms are defined as a sum of the anxiety and depression items scores on the PANSS scale (Andreasen et al. 2005, Kay et al. 1987).

The ASSESS includes the following PANSS items: for positive symptoms P1-delusional ideas, P2-conceptual disorganization, P3-hallucinatory behavior, for negative symptoms: N1-affective flattening, N4-social withdrawal, N6-lack of spontaneity and fluency of conversation, and for general symptoms: G2-anxiety, G5-mannerisms and posture, G6-depression and G9-unusual thought content.

The sub scores of PANSS items (positive, negative and general symptoms) discussed in this study were those of the items included in ASSESS battery. Therefore, in order to avoid confusion with the PANSS scale scores, we used the PANSS* annotation to mark the PANSS items (previously defined) used by the ASSESS battery.

Cognitive functioning was assessed using Brief Assessment of Cognition in Schizophrenia (BACS) (Keefe et al. 2004), medication satisfaction using Medication Satisfaction Questionnaire (MSQ) (Gharabawi et al. 2006) and personal and social functioning using Personal and Social Performance Scale (PSP) (Morosini et al. 2000).

ASSESS battery includes also retention in treatment that was defined as a minimum of 12 months (Andreasen et al. 2005).

BACS scale is a quick and efficient tool for measuring cognition in patients with schizophrenia. This tool requires less than 35 minutes for its completion. The domains of cognitive function that are assessed by the BACS are those found to be consistently impaired, and consistently related to outcome, in schizophrenia: verbal memory, working memory, motor speed, attention, executive functions and verbal fluency.

PSP is an instrument used to assess the psychosocial functioning level. This scale consists of four main areas: socially useful activities, personal and social relationships, self-care, and disturbing and aggressive behavior. Each of the four domains is rated in six degrees of severity: absent, mild, manifest, marked, severe and very severe.

MSQ is a single-item questionnaire, which evaluates satisfaction regarding antipsychotic medication in patients with schizophrenia. Patients' dissatisfaction with treatment may act as an early indicator of non-adherence to medication, and it is most likely to have a negative impact on the clinical effectiveness and efficiency of medication.

Statistical analysis

Statistical Product and Service Solutions version 20 (SPSS v20) was used to analyze the data. Spearman coefficients were used to assess the relation between each PANSS* sub scores (positive, negative, general and total) and each sub scores from BACS, MSQ and PSP. Paired t-tests were used to see the difference between each PANSS* sub scores (positive, negative, general, total), BACS sub scores, MSQ scores and PSP scores. Statistical significance was reached for a p value <0.05.

RESULTS

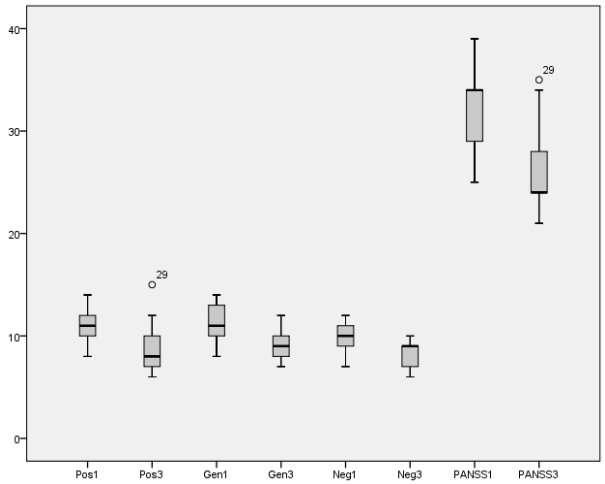
Mean age of patients was 37.8 years (SD=11.5) and mean duration of illness (since first diagnosis of schizophrenia) was 10 years (SD=10.4). Six of the patients had a positive family history of psychiatric disorders, 9 had ethanol abuse and 6 had a suicide attempt history.

Mean PANSS* total score at inclusion (visit 1) was 32.63 (SD=3.76).

Course across the visits

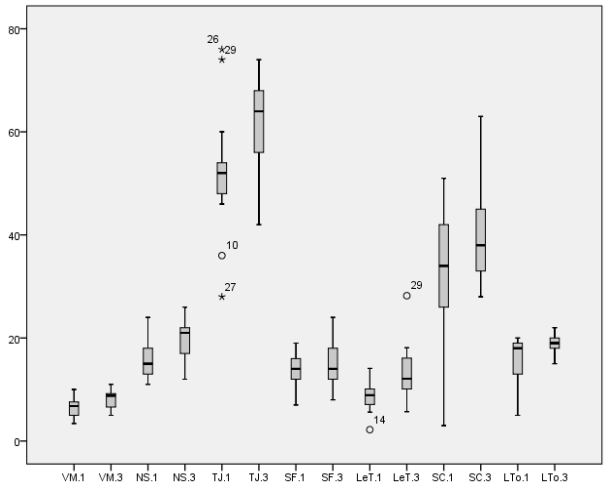
The variations of PANSS* items from visit 1 to visit 2 and 3 were analyzed and a significant improvement of psychopathology was observed. The mean delusion scores decreased from visit 1 to visit 2 by 0.26 points and from visit 1 to visit 3 by 0.53 points. Similar decreases from visit 1 to visit 3 were observed in unusual thought content item (0.61 points), hallucinatory behavior (0.91 points), conceptual disorganization (0.69 points), mannerisms/posturing (0.46 points), blunted affect (0.30 points), social withdrawal (0.53 points), lack of spontaneity (1.23 points), anxiety (0.38 points) and depression (0.53 points).

Paired t-tests were used to analyze the evolution of mean scores differences between visit 1 and visit 3 for PANSS* sub scores, BACS subscales, MSQ scores and PSP scores. A statistically significant difference on mean positive PANSS* scores ($t(12)=2.48$, $p=0.029$), on mean general PANSS* scores ($t(12)=2.98$, $p=0.011$), mean negative PANSS* scores ($t(12)=4.88$ $p=0.000$) and mean total PANSS* scores ($t(12)=3.54$ $p=0.004$) was observed (Figure 1).



PANSS* - Positive and Negative Symptoms Scale including items: P1 - delusional ideas, P2 - conceptual disorganization, P3 - hallucinatory behavior, N1-affective flattening, N4-social withdrawal, N6-lack of spontaneity and fluency of conversation, G2-anxiety, G5-mannerisms and posture, G6-depression and G9-unusual thought content; Pos1-PANSS positive subscale scores at visit 1; Pos3-PANSS positive subscale scores at visit 3; Gen1-PANSS general subscale scores at visit 1; Gen3-PANSS general subscale scores at visit 3; Neg1-PANSS negative subscale scores at visit 1; Neg3-PANSS negative subscale scores at visit 3; PANSS1-Positive and Negative Symptoms Scale at visit 1; PANSS3-Positive and Negative Symptoms Scale at visit 3

Figure 1. PANSS* sub scores means evolution from visit 1 to visit 3

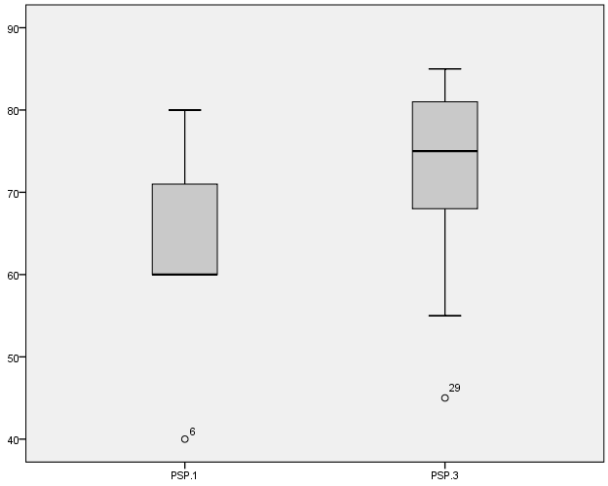


VM.1-Verbal Memory at visit 1; VM.3-Verbal Memory at visit 3; NS.1-Numeric Sequence at visit1; NS.3-Numeric Sequence at visit 3; TJ.1-Token Motor Task at visit 1;TJ.3- Token Motor Task at visit 3 ; SF.1-Semantic Fluency at visit1; SF.3- Semantic Fluency at visit 3; LeT.1-Letter Test at visit 1; LeT.3-Letter Test at visit 3; SC.1-Symbol Codification at visit 1; SC.3-Symbol Codification at visit 3; LTo.1-London Tower at visit 1; LTo.3- London Tower at visit 3)

Figure 2. BACS sub scores means evolution from visit 1 to visit 3

Analyzing the subscales of BACS scale from visit 1 to visit 3 we found a statistically significant improvement on mean Verbal Memory (VM) scores (t(12)= -3.08 p=0.010), mean Numeric Sequence (NS) scores (t(12)=-2.53 p=0.026), mean Letter Test (LeT) scores (t(12)=-3.406 p=0.005), mean Symbol Codification (SC) scores (t(12)=-2.343 p=0.037) and mean London Tower (LTo) scores (t(12)=-2.588 p=0.024) (Figure 2). Performances in cognition were found to be enhanced during this 0.5 year of follow-up as shown by the BACS scale.

There is also a statistically significant difference on mean PSP scores between visit 1 and visit 3 (t(12)=-2.533 p=0.026) (Figure 3).



PSP-Personal and Social Performance Scale

Figure 3. PSP subscore means evolution from visit 1 to visit 3

Medication satisfaction (most of the patients received various treatments) rated on MSQ scale increased from 5.23 to 5.62.

A statistically significant difference on mean positive PANSS* scores (t(22)=2.58, p=0.017), mean general PANSS* scores (t(22)=2.72, p=0.012), mean negative PANSS* scores (t(22)=2.71, p=0.013) and mean total PANSS* scores (t(22)=3.05, p=0.006) between visit 1 and visit 2 was also observed.

Despite the fact that all BACS subscales and MSQ mean scores improved, no statistically significant results were obtained between mean scores at visit 1 and visit 2. A statistically significant difference on PSP scores between visit 1 and visit 2 t(22)=-2.28, p=0.009 was observed.

All calculations were made interindividually, not intraindividually since only 11 patients underwent visit 3.

In this longitudinal observational study the overall pharmacological treatment was effective as shown by the major improvements of the mean PANSS* scores from visit 1 to visit 2 and 3. Similar improvements were observed in cognition, social functioning and treatment satisfaction. This improvement in all domains shows the close relation between psychopathology, cognition, social functioning and treatment satisfaction. It shows as well the importance of assessing the effectiveness of an antipsychotic treatment in all these domains.

Correlational analyses

When analyzing the correlations using Spearman test between positive, negative, general and total sub-

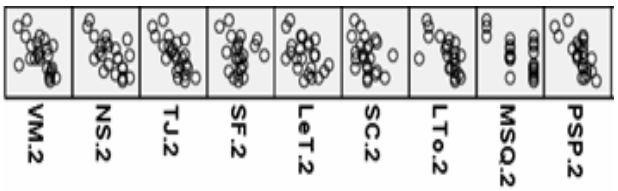
scores of PANSS* and scores of BACS sub scales at visit 1, no statistically significant relationship was obtained. We observed a statistically significant negative relationship between PANSS* positive scores and PSP (r(30)=-0.502 p=0.03), between negative sub scores of PANSS* and PSP(r(30)=-0.622 p=0.000) and between total PANSS* sub score and PSP (r(30)=-0.626 p=0.000).

Same Spearman correlation was used for analyzing data at visit 2. Statistically significant negative relationship between PANSS* positive scores and VM (r(21)= -0.579 p=0.004), NS (r(21)=-0.605 p=0.002), Token Test (TT) (r(21)=-0.655 p=0.001), LeT (r(21)=-0.47 p=0.023), SC (r(21)=-0.525 p=0.01) and LTo (r(21)=-0.691 p=0.00) were observed. A statistically significant negative relationship between PANSS* positive scores and MSQ (r(21)=-0.460 p=0.027) was obtained. A statistically significant negative relationship between PANSS* positive scores and PSP (r(21)=-0.634 p=0.001) was also found.

A statistically significant negative relationship between PANSS* general scores and VM (r(21)=-0.475 p=0.022), NS (r(21)=-0.451 p=0.031), TJ (r(21)=-0.767 p=0.000), LeT (r(21)=-0.425 p=0.043), LTo (r(21)= -0.591 p=0.003), MSQ (r(21)=-0.455 p=0.029) and PSP (r(21)=-0.625 p=0.001) was found.

A statistically significant negative relationship between PANSS* negative scores and VM (r(21)=-0.635 p=0.001), NS (r(21)=-0.568 p=0.005), TJ (r(21)=-0.568 p=0.005), LTo (r(21)=-0.515 p=0.012), MSQ (r(21)= -0.446 p=0.033), and PSP (r(21)=-0.546 p=0.007) was found.

A statistically significant negative relationship between PANSS* total scores and VM (r(21)=-0.599 p=0.003), NS (r(21)=-0.580 p=0.004), TJ (r(21)=-0.712 p=0.000), LeT (r(21)=-0.428 p=0.042), LTo (r(21)= -0.663 p=0.001), MSQ (r(21)=-0.513 p=0.012), and PSP (r(21)=-0.669 p=0.000) was found (Figure 4).



(PANSS*-Positive and Negative Symptoms Scale including items: P1-delusional ideas, P2-conceptual disorganization, P3-hallucinatory behavior, N1-affective flattening, N4-social withdrawal, N6-lack of spontaneity and fluency of conversation, G2-anxiety, G5-mannerisms and posture, G6-depression and G9-unusual thought content; BACS-Brief Assessment of Cognition in Schizophrenia; PSP-Personal and Social Performance Scale; MSQ-Medication Satisfaction Questionnaire; VM.2-Verbal Memory at visit 2; NS.2-Numeric Sequence at visit 2;TJ.2-Token Motor Task at visit 2;SF.2-Semantic Fluency at visit 2; LeT.2-Letter Test at visit 2; SC.2-Symbol Codification at visit 2; LTo.2-London Tower at visit 2; MSQ.2-Medication Satisfaction Questionnaire at visit 2; PSP.2- Personal and Social Performance Scale at visit 2)

Figure 4. Correlations at visit 2 between PANSS* total score and BACS subscores, PSP and MSQ

At visit 3, there was no statistically significant relationship between mean PANSS* sub scores and the sub scales of BACS or the MSQ. The small number of patients that underwent visit 3 may explain this lack of statistical correlation.

A statistically significant negative relationship between PANSS* total scores and PSP (r(11)=-0.839 p=0.000) was found. Similar results for PANSS* positive, negative and general and PSP were obtained. Analyzing general, negative and total score of PANSS* a statistically significant positive relationship with SF was found.

DISCUSSION

This study revealed that the ASSESS battery is easy to apply in clinical practice. It is a suitable tool for psychiatrists since it covers all the relevant aspects of the course of schizophrenia from the acute over remission to recovery state in a compact form. ASSESS is very useful for clinicians because they will not have to apply multiple different evaluation instruments and may use instead this battery with few selected scales and single items.

The design of the study illustrates that using ASSESS the course and remission of patients with schizophrenia may be easily monitored in detail and with a valid formula.

The variations of PANSS* sub scores from visit 1 to visit 2 and 3 indicated a significant improvement of psychopathology for during this follow-up. A similar improvement was observed in cognition, social functioning and treatment satisfaction as shown by BACS, PSP and MSQ scales. Statistically significant correlations between PANSS* and BACS subscales and between PANSS* subscales and PSP and MSQ scales were observed only at visit 2.

One of the many challenges psychiatrists face in everyday clinical practice is to determine whether or not a treatment is effective in their patients, including when the treatment is focused mostly on symptom reduction (Brissos et al. 2011). Nevertheless, the assessment of treatment effectiveness should aim beyond simple efficacy and explore other impaired areas in patients with schizophrenia (Glick et al. 2011). An important aspect of this is the patient's point of view regarding the efficacy and effectiveness of a treatment. There are many studies showing that despite an adequate treatment and the remission of psychotic symptoms, cognitive functioning and personal and social functioning is still impaired (Addington et al. 1991, Marder & Fenton 2004, Keefe et al. 2005). Therefore, social functioning and cognitive impairment must be considered crucial outcome measures in randomized controlled drug trials, and in studies of innovative psychosocial therapies and service models (Juckel & Morosini 2008).

The ASSESS battery was designed as a tool which could offer a global perspective of treatment effective-

ness. When clinicians use the ASSESS battery they can investigate additional domains, beside the symptomatic remission, which are impaired in patients with schizophrenia: affective symptoms (PANSS* items), cognitive functioning (BACS), personal and social functioning (PSP) as well as medication satisfaction (MSQ). Treatment retention/discontinuation during a period of 12 months is important when assessing the effectiveness and is included in ASSESS. Thus the ASSESS battery evaluates the efficacy of treatment and at the same time other domains that are paramount for the quality of life of these patients.

There are further advantages in using ASSESS checklist: the solid and objective documentation of treatment success for the clinicians, patients and families as well as for the insurance authorities (in order to justify treatment costs).

Mean PANSS* scores on each item were analyzed at visit 1, 2 and 3. The mean scores of all items showed a decrease, illustrating that psychotic symptoms improved during the follow-up period. The same results were obtained when PANSS* mean sub scores (positive, negative, general and total) were analyzed. All the variations in PANSS* mean scores reached statistical significance at both visit 2 and visit 3.

We used Spearman correlations to demonstrate that changes in one domain can influence other domains. For example: psychotic symptoms evolution (evaluated by PANSS* scores) influences cognition (evaluated by BACS subscales scores), psychosocial functioning level (evaluated by PSP scale scores) and treatment satisfaction (evaluated by the MSQ scale scores).

Correlations are useful because they can indicate a predictive relationship that can be exploited in practice.

A higher score of psychotic symptoms is correlated with lower treatment satisfaction, which is sustained by a negative statistically significant correlation between PANSS* sub scores and MSQ. We also observed a negative correlation between PANSS* sub scores and PSP during all study visits, showing a close relationship between psychotic symptoms, and the personal and social functioning.

No statistical significant correlation between BACS sub scales mean scores and PANSS* mean sub-scores were observed at visit 1 probably due the heterogeneous lot structure (4 patients in remission and 28 in acute phase).

At visit 2 almost all subscales of BACS showed a statistical significant negative correlation with PANSS* sub scores. A similar trend was observed at visit 3 but without a statistical significance, probably due to the small sample of patients analyzed.

There was no statistically significant relationship between mean PANSS* sub scores and the subscales of BACS or the MSQ at visit 3. The small number of patients that underwent visit 3 may explain this lack of statistical significance. However, significant statistical relationship between PANSS* subscales mean scores and PSP mean scores were observed at visit 3.

Cognitive functioning was more impaired when a higher PANSS* score was obtained. Cognitive impairment, personal and social functioning, and treatment satisfaction are correlated with psychotic symptoms.

The primary limitation of our study is the small number of included patients. Another drawback is the lack of homogeneity in the study groups at each visit, due to the decreasing number of patients who presented during the follow-up period. Another study limitation is that the same principal and back-up rater applied the scales.

CONCLUSIONS

To sum up, the ASSESS battery is a valuable tool that evaluates multiple impaired domains in patients with schizophrenia and our study suggests that this is an important measure for the overall therapeutic outcome. The ASSESS battery is easy to apply in day-to-day practice and is a very useful tool to evaluate treatment efficacy and effectiveness. Taking into consideration the encouraging results of this pilot study, further multicenter studies, with larger sample size and longer duration are needed.

Acknowledgements: None.

Conflict of interest: None to declare.

References

1. *Addington J, Addington D, Maticka-Tyndale E: Cognitive functioning and positive and negative symptoms in schizophrenia. Schizophr Res 1991; 5:123-134.*
2. *American Psychiatric Association: Diagnostic and Statistical Manual of Mental Disorders. Fourth edition (Text Revision). American Psychiatric Association, Washington DC, 2000.*
3. *Andreasen NC, Carpenter WT Jr, Kane JM, Lasser RA, Marder SR, Weinberger DR: Remission in Schizophrenia: Proposed Criteria and Rationale for Consensus. Am J Psychiatry 2005; 162:441-449.*
4. *Brissos S, Molodynski A, Dias VV, Figueira ML: The importance of measuring psychosocial functioning in schizophrenia. Ann Gen Psychiatry 2011; 10:18.*
5. *Burns T, Patrick D: Social functioning as an outcome measure in schizophrenia studies. Acta Psychiatr Scand 2007; 116:403-418.*
6. *Fleischhacker WW, Keet IP, Kahn RS, EUFEST Steering Committee: The European First Episode Schizophrenia Trial (EUFEST): rationale and design of the trial. Schizophr Res 2005; 78:147-56.*
7. *Gharabawi GM, Greenspan A, Rupnow MF, Kosik-Gonzalez C, Bossie CA, Zhu Y, et al.: Reduction in psychotic symptoms as a predictor of patient satisfaction with antipsychotic medication in schizophrenia: Data from a randomized double-blind trial. BMC Psychiatry 2006; 6:45.*
8. *Glick ID, Correll CU, Altamura AC, Marder SR, Csernansky JG, Weiden PJ et al.: Mid-term and long-term efficacy and effectiveness of antipsychotic medications for*

schizophrenia: a data-driven, personalized clinical approach. J Clin Psychiatry 2011; 72:1616-27.

9. *Hartling L, Abou-Setta AM, Dursun S, Mousavi SS, Pasichnyk D, Newton AS: Antipsychotics in Adults with Schizophrenia: Comparative Effectiveness of First-Generation Versus Second-Generation Medications: A Systematic Review and Meta-analysis. Ann Intern Med 2012; 157:498-511.*
10. *Jones PB, Barnes TR, Davies L, Dunn G, Lloyd H, Hayhurst KP et al.: Randomized controlled trial of the effect on Quality of Life of second- vs first-generation antipsychotic drugs in schizophrenia: Cost Utility of the Latest Antipsychotic Drugs in Schizophrenia Study (CUtLASS 1). Arch Gen Psychiatry 2006; 63:1079-1087.*
11. *Juckel G, Morosini PL: The new approach: psychosocial functioning as a necessary outcome criterion for therapeutic success in schizophrenia. Curr Opin Psychiatry 2008; 2:630-639.*
12. *Juckel G, de Bartolomeis A, Gorwood P, Mosolov S, Pani L, Rossi A et al.: Towards a framework for treatment effectiveness in schizophrenia. Neuropsychiatr Dis Treat 2014; 10:1867-1878.*
13. *Kay SR, Fiszbein A, Opler LA: The positive and negative syndrome scale (PANSS) for schizophrenia. Schizophr Bull1987; 13:261-276.*
14. *Keefe RS, Goldberg TE, Harvey PD, Gold JM, Poe MP, Coughenour L: The Brief Assessment of Cognition in Schizophrenia: reliability, sensitivity, and comparison with a standard neurocognitive checklist. Schizophr Res 2004; 68:283-297.*
15. *Keefe RS, Eesley CE, Poe MP: Defining a cognitive function decrement in schizophrenia. Biol Psychiatry 2005; 57:688-691.*
16. *Leucht S, Lasser R: The concepts of remission and recovery in schizophrenia. Pharmacopsychiatry 2006; 39:161-170.*
17. *Leucht S, Arbter D, Engel RR, Kissling W, Davis JM: How effective are second-generation antipsychotic drugs? A meta-analysis of placebo-controlled trials. Mol Psychiatr 2009; 14:429-447.*
18. *Liberman RP, Kopelowicz A: Recovery from Schizophrenia: A Concept in Search of Research. Psychiatr Serv 2005;56:735-742.*
19. *Lieberman JA, Stroup TS, McEvoy JP, Swartz MS, Rosenheck RA, Perkins DO et al.:Effectiveness of antipsychotic drugs in patients with chronicschizophrenia. N Engl J Med 2005; 353:1209-1223.*
20. *Marder SR, Fenton W: Measurement and treatment research to improve cognition in schizophrenia: NIMH MATRICS initiative to support the development of agents for improving cognition in schizophrenia. Schizophr Res 2004; 72:5-9.*
21. *Morosini PL, Magliano L, Brambilla L, Ugolini S, Pioli R: Development, reliability and acceptability of a new version of the DSM-IV Social and Occupational Functioning Assessment Scale (SOFAS) to assess routine social functioning. Acta Psychiatr Scand 2000; 101:323-329.*
22. *Nasrallah HA, Targum SD, Tandon R, McCombs JS, Ross R: Defining and measuring clinical effectiveness in the treatment of schizophrenia. Psychiatr Serv 2005; 56:273-282.*
23. *Schennach-Wolff R, Jäger M, Seemüller F, Obermeier M, Messer T, Laux G et al.:Defining and predicting functional outcome in schizophrenia and schizophrenia spectrum disorders. Schizophr Res 2009; 113:210-217.*
24. *Walters Y, Agius M: Do atypical antipsychotics improve cognition? Psychiatr Danub 2014; 26:285–288.*

Correspondence:

Maria Ladea, MD
"Prof. Dr. Al. Obregia" Clinical Hospital of Psychiatry
Berceni 10-12, Sector 4, Bucharest, Romania
E-mail: marialadea@gmail.com