

# Rehabilitation of Movement Disorders and Psychomotor Deficiency in Schizophrenia Residual Type

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## Abstract

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Movement disorders and psychomotor deficiency is highly represented among patients in Schizophrenia – residual type.

Our therapeutic work and the results we are herewith presenting, reveal that the psychomotor deficiency by Schizophrenia residual conditions represent new and significant indication fields for specific rehabilitation treatment in psychiatry.

Evaluation of efficacy after 6 weeks specific rehabilitation treatment with the Vilan method showed: very satisfactory results in correction of involuntary movements of the torso, bradykinesia of the hands, praxia and the simple simultaneous movements; satisfactory correction of involuntary movements of the extremities, walking and the facial gestures. No correction was in: involuntary movement of mouth and face, tremor, ideation, ideo-motor series and in complex simultaneous movement.

## Introduction

### *The basic rehabilitation treatment concept*

**Residual-type schizophrenia** is characterized by a past history of at least one episode of schizophrenia, but the person currently has no "positive" symptoms (such as delusions, hallucinations, disorganized speech, or behavior), but has predominance of "negative" symptoms [1].

Our investigation showed many psychomotor, speech and cognitive disturbances among patients with Schizophrenia residual type. Movement disorders and motor deficiency is highly represented among patients in Schizophrenia – residual type (DSM IV): 37% of patients examined in our research had psycho-motor disturbances. Dominant disturbances are the following: disturbed tonus among 65% of patients, abnormal postural reactions among 90%, abnormal

voluntary movements among 75%, disturbed speech among 85%, disturbed static and dynamic postures among 90%. Involuntary movements are present among 20% of patients [2].

The rehabilitation treatment oriented towards stimulation of motor, sensory and cognitive functions and successfully applicable in cases of psycho-motor retardation among children can be also applied on adults with acquired CNS damages on the basis of conditional analogy between psychomotor retardation among children and psychomotor regression/dissolution among adult patients [3].

We based our rehabilitation treatment of motor deficiency among post-psychotic residual conditions (schizophrenia - residual type) on: A) theoretical framework stemming from the concept by H. Jackson, B) contemporary special education principles, and C) the appliance of specially adapted kinesytherapeutic method (VILAN method with elements of Bobath, Voita and Ayres techniques) [4-8].

Our therapeutic work and the results we are herewith presenting, reveal that the stated psycho-motor deficiency residual conditions represent new and significant indication fields for specific rehabilitation treatment applied on physically disabled persons.

#### *Types of rehabilitation treatment*

The treatment we applied is oriented towards:

1. Motivation, 2. Relaxation, 3. Motor stimulation, 4. Verbal stimulation, 5. Phono-stimulation, 6. Photo-stimulation, and 7. Stimulation of Gnostic Functions.

One of the basic principles in rehabilitation treatment of developed and acquired CNS damages are preparing the patient for treatment in 4 stages: Stage I is establishing contact and building a relationship of trust; Stage II is relaxation; Stage III is applying reflex inhibiting postures and movements (Bobath, 1980 [4]); and Stage IV is the motor stimulation stage.

Motor stimulation is always preceded by reflex inhibition formulas, specially selected ones which inhibit the abnormal tonus coupled with abnormal movement and posture.

**Table 1: Rehabilitation Methods**

1. MOTIVATION
2. RELAXATION
Local, progressive, total,
Reflex inhibited postures and movements
3. MOTOR STIMULATION
3.1 STIMULATIVE EXERCISES
- Exteroceptive, proprioceptive, sensoric and central stimulation
- Stimulation of Postural Reactions;
- "VILAN" METHOD (Ilankovic V et Ilankovic N, 1995 [8]).
**Appliance of elements of SPECIAL TECHNICS:
• BOBATH technique of Reflex Inhibition and Facilitation
• VOJTA technique of Reflex Movement
• KABATH tech. of Proprioceptive Neuromuscular Facilitation
• AYRES technique of Sensoric Integration
• FAY technique
• PHELP technique
3.2 REEDUCATION EXERCISES
3.3 ACTIVE PSYCHO MOTOR EXERCISES

The subject of our research is psychomotor deficiency of chronically mentally ill patients suffering from schizophrenia of the residual type.

The basic idea of our research is providing a rehabilitation program aimed at alleviating the level of

psychomotor disability of such patients.

The aims of the study were: 1) the elaboration and appliance of a rehabilitation program adapted to the motor deficiency patients' syndrome; 2) efficiency evaluation of the applied rehabilitation methods and techniques; and 3) an attempt to conceive an original rehabilitation model for chronically mentally ill patients suffering from motor deficiency.

## **Material and Methods**

### *Specimen groups*

Group "1" - residual psychosis/before treatment: 60 examined persons, male and female, age between 25 and 50, clinically diagnosed with schizophrenia - residual type (according to DSM-IV) with at least two psychotic decompensations, treated stationary, no registered evidence of: encephalitis, meningoencephalitis, cranio-cerebral injury or chronic alcoholism.

Group "2" - residual psychosis / after treatment: 60 of the same persons examined after 6-8 weeks of treatment.

### *Specimen Structure*

Based on sex: Men 30 or 50%, Women 30 or 50%. Based on diagnosis: 100% dg: Schizophrenia - residual type (DMS-IV). Based on age: Minimum 25 years of age Maximum 50 years of age Average age of women: 38.10 years Average age of men: 36.73 years

### *Time and place of research*

Complete research (diagnostics and treatment) was undertaken at the Clinic for Psychosis "Vladimir V. Vujic" of the Institute for Psychiatry of the Clinical Center in Belgrade.

### *Instruments and methods of evaluation*

Evaluation (functional diagnostics) of motor deficiency of patients before and after the rehabilitation treatment (which in average lasted 6 - 8 weeks) was done according to principles and methods described in the study "assessment of motor deficiency in schizophrenia" by the same authors i.e.( Ilankovic V, Ilankovic A, Ilankovic N, 2014) [2].

### *Rehabilitation methods*

The rehabilitation methods applied in this research are stated in the reference [2].

### Statistical review

The statistical review encompasses: descriptive specimen statistics, table breakdown of results, hypothesis testing - establishing the statistical significance of differences with a series of unifactor (T-tests) and multifactor statistical tests, and statistical analysis.

## Results

### Results on the Webster Scale for Parkinsonism (WEBSTER)

From the maximum disturbances score which is 30, the patients that we researched had an average (pathological) score of 22.13.

After applying the rehabilitation program it was established that a highly statistically significant recovery was established, as the pathological score was reduced down to an average value of 12.33 or down to 44.28%.

### Results on the Scale of Involuntary Movements (AIMS)

An average pathological score of 9.51 was noted among our patients with shizophrenia-residual type. After treatment the average score was 7.22 or 24% less.

Although the reduction of involuntary movements was statistically highly significant, we have to note the motor disturbance in question is one of therapeutically most refractive.

### Results on the Tardive Dyskinesia Scale (TDRS)

Prior to treatment (rehabilitation and psychopharmacological) patients showed an average pathological score of 64.17, and after the completion of the therapeutic program the score was 52.67 or only 18% less.

Although the dyskinesia reduction in our research was statistically highly significant ( $p < 0.01$ ), it has to be stressed again that dyskinesia is one of therapeutically most refractive motor disturbances.

### Results on the Scale of Depressive Retardation (DRS)

The Scale of Depressive Retardation which we used in our research indicated that all examined patients show an extremely high level of depressive retardation - the average score prior to treatment (psychiatric and rehabilitation) was as high as 54.23! (The maximum score is 60, while a score of  $>20$  are already indicated as depressive retardation!).

### Results on the Left-Right Orientation Test

Results indicate that the average middle value achieved on tests prior to treatment was 6.73 of max. 8. After treatment (drug therapy and rehabilitation) there was better achievement - middle value was 7.47 (the difference is not statistically significant  $p > 0.05$ ), but the time dimension of movement performance was compromised (an evidently significant prolongation of time, especially regarding movement initiation - there is noticeable inertia, ideo-motor slowing down leading to "blockage"!).

### Results on Praxis Protocol

The overall achievement on "Praxis Protocol" among patients examined was within middle value of 30.90 of the maximum possible 75, i.e., only 41% prior to treatment implemented. After the implementation of psychiatric and rehabilitation treatment there came about a statistically highly significant recovery of praxia functions ( $p < 0.01$ ) - average score 57.47 or 77% of the maximum (a recovery of 85.98% in comparison to the starting position!).

Such high percentage of relative recovery shows: that praxia functions prior to treatment were considerably insufficient, that the treatment (although undertaken within a limited period of time) had significant positive effects, and that a "seemingly" "small percent" remained with regards to inefficiency in the most delicate and most complex sphere of complex movements and ideo-motor series. That fact, unfortunately, puts our patients into the category of seriously motor (psycho-motor) disabled persons! [10].

### Results on the Test for Simultaneous Movements (TSM)\*

Overall achievements on this test are for this reason very low - average achievement prior to treatment 1.97 (of max. possible 9), i.e. 21%.

**Table 2: Results Achieved After Kinesytherapy.**

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***	Very satisfactory results in correction of: Involuntary movements of the torso Bradykinesia of the hands Praxia Simple simultaneous movements
**	Satisfactory correction of: Involuntary movements of the extremities Walking Facial gestures
*	Meager or no correction at all of: Involuntary movement of mouth and face Tremor Ideation Ideo motor series Simultaneous movement complex actions

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After treatment the achievement on the Test for Simultaneous Movements statistically significantly improved ( $p < 0.05$ ), but the real achievement both as far as quantity and especially quality was concerned was significantly insufficient! From the total of 9 tasks the majority of examined patients successfully completed in average only approximately 3 tasks and those only relatively simple ones!

**Table 2: Rehabilitation of motor deficiency in schizophrenia - statistical analysis of treatment results.**

	Before	After	t	P
1. WEBSTER Scale	22.13	12.33	13.95	<0.01
2. AIMS Scale	9.51	7.72	9.89	<0.01
3. TDRS	64.17	52.67	3.59	<0.01
4. DRS	54.23	28.40	21.29	<0.01
5. LR	6.73	7.47	0.85	>0.05
6. PRAXIA	30.90	57.47	8.81	<0.01
7. TSM*	1.97	3.23	2.71	<0.05

## Discussion

### *Depressive retardation*

After treatment (psychiatric and rehabilitation) (the average period of which was 6-8 weeks), there emerged a highly statistically significant reduction ( $p < 0.01$ ) of the overall score of depressive retardation, but the remaining, average score of 28.40 still indicated a persisting degree of depressive retardation! A possible explanation should be sought in the partly fixed atimohormic ("negative") syndrome which characterizes residual psychotic conditions (schizophrenia), side effects of drug therapy, inadequate and inefficient medication, but also in the persisting psycho-motor deficiency and the patients' self-awareness of their disability [9].

### *Praxia*

Such high percentage of relative recovery shows: that praxia functions prior to treatment were considerably insufficient, that the treatment (although undertaken within a limited period of time) had significant positive effects, and that a "seemingly" "small percent" remained with regards to inefficiency in the most delicate and most complex sphere of complex movements and ideo-motor series. That fact, unfortunately, puts our patients into the category of seriously motor (psycho-motor) disabled persons! [10].

### *Final results of study*

On the basis of the results achieved in this research one can state that the applied rehabilitation model, although a conceptual novelty and representing

pioneer work on this type of psychiatric population, implemented in very limited time periods, gave very satisfactory therapeutic results. It is our assumption that a longer time period in which the rehabilitation work based on this program could be continued would provide even more favourable results in the field of psycho-motor disturbances correction thus increasing personal, professional and social efficacy of patients.

### *Organization of hospital and post hospital rehabilitation*

Within the same context, when speaking of wider application and organization of such specific rehabilitation work conditions must be created after hospital/clinic treatment, for extended, post-hospital treatment (out-patient clinics, day clinics). This would presume allocating and adequately equipping premises for kinesic-therapeutic work and parallel education of expert cadre (physiotherapists, special educators, physicians).

In the course of this research we also came across acute psychotic decompensation. We noted that elements of our rehabilitation model were applicable on these conditions as well, coupled with a wide specter of therapeutic possibilities (lower levels of psycho-motor organization - regression). It is our opinion that introducing early and timely rehabilitation in cases of acute psychoses would significantly decrease chronic sequels on the motor field!

In a conclusion: 1) rehabilitation in psychiatry today practically encompasses merely the fields of psychological and social rehabilitation coupled with a certain degree of occupational treatment; 2) there are no rehabilitation programs for psycho-motor rehabilitation and reeducation (at least not in our milieu) of mentally ill patients, although these patients unfortunately have already partially fixed, inadequate motor patterns. They are described as: "having bizarre postures, moving awkwardly, blundering", and nothing is being undertaken regarding that; 3) such problems are not experienced by patients suffering from neurological diagnosis (following head injuries, encephalitis, tumor operations and other brain diseases) although they practically have identical clinical pictures! (they, of course, have the right to be treated in rehabilitation centers, while patients classified as "mental", do not...); 4) on the basis of results stemming from this research it can be said that the applied rehabilitation model, although conceptually a novelty, and representing pioneer work being applied on this type of psychiatric population, in a very limited period of time, has provided very satisfactory therapeutic results; 5) the general conclusion is that the so called psychiatric patients suffering from postpsychotic residuals, besides being mentally disabled, also suffer from serious motor disturbances, into also fits them into the category of physically disabled persons. It is evident such patients, besides psychiatric (psychopharma-cological) treatment, also require systematic rehabilitation –

special kynesitherapy, with aim of improving their health, functioning and quality of life; and 6) future research is necessary with bigger sample of patients with Schizophrenias and Schizophrenia-like syndromes for further evaluation the effects of long lasting rehabilitation programs on functionality and quality of life of this patients.

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